



38th WORLD RADIOCOMMUNICATION CONFERENCE

Key Outcomes of WRC-19 and Preparation for WRC-23

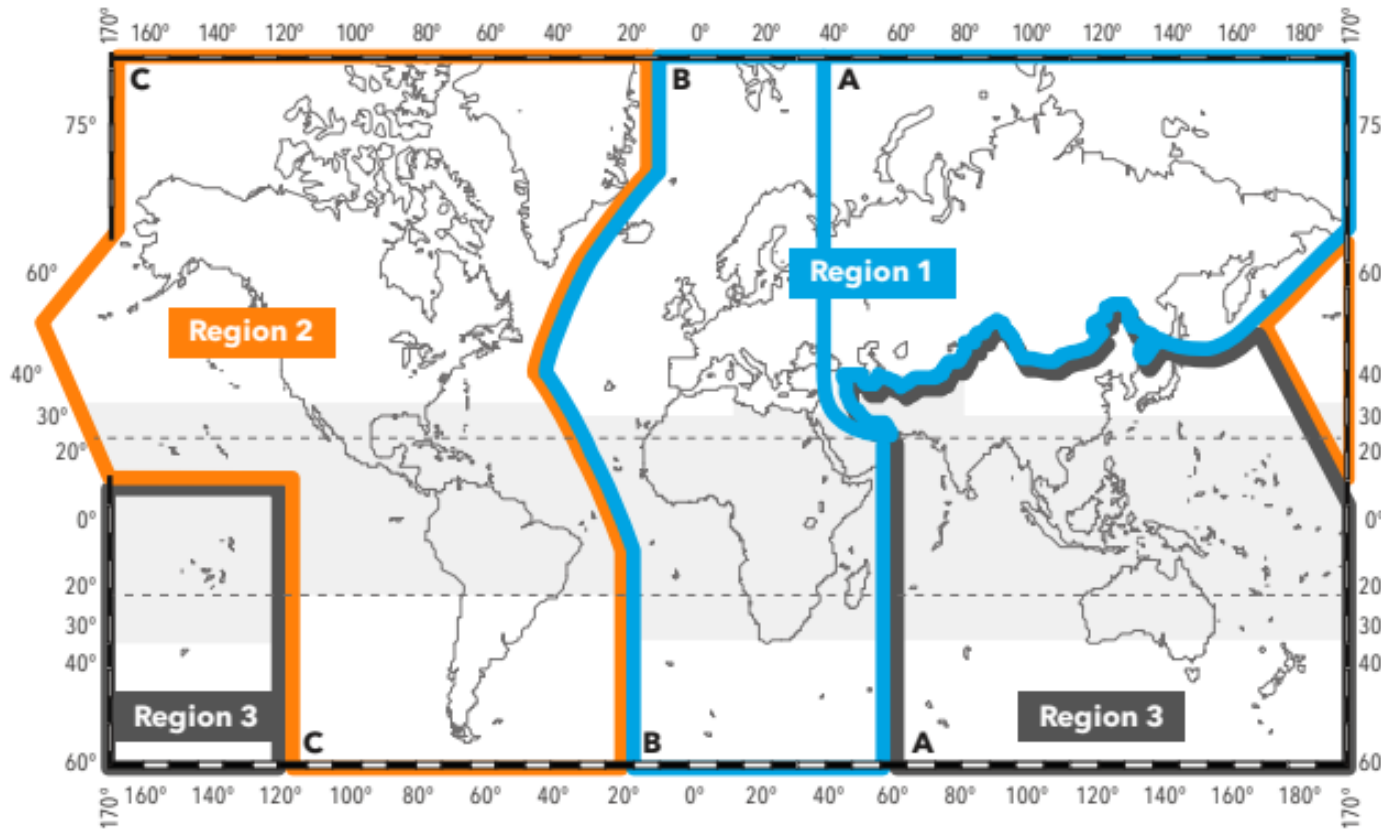




World Radiocommunication Conferences (WRCs)

- **Updated the Radio Regulations, the international treaty on the use of radio spectrum and satellite orbits**
- **Brought together all stakeholders** in a process that is aimed at **building consensus**
- Provided a **stable and predictable regulatory environment** needed for **future investments**
- Enabled **new radiocommunication systems and applications** to **access the radio spectrum**
- Protected the operation of **existing radiocommunication services**
- Ensured the **rational, equitable, efficient and economical use** of the **radio-frequency spectrum and satellite-orbit resources**

Worldwide or Regional Spectrum Harmonization



Benefits :

- Reduces the potential for **harmful interference**
- Enables interoperability and **international roaming**, allowing citizens to use the same device in different countries
- Increases economies of scale, thereby enabling **affordable devices and services**
- Supports **emergency communications**

WRC-19 in numbers

- 4 week discussions, 28 October - 22 November 2019 , Sharm El-Sheikh, Egypt
- 3 420 participants , 163 administrations, 129 other entities, including industry
- 38 agenda items and issues, 568 documents, 5811 proposals
- Spectrum and regulations for most radiocommunication services



Topics considered at WRC-19

- 1.13
- 1.14
- 1.15
- 1.16



Fix. & Mob. BB Apps
 (24.25 < IMT < 86 GHz,
 HAPS, Apps.Id>275 GHz,
 WAS/RLAN @ 5 GHz)

**Maritime (GMDSS
 modernization (+Sat.),
 use of radio devices,
 VDES Sat component)**



- 1.8
- 1.9.1
- 1.9.2

1.1



**Amateur in R1
 @ 50-54 MHz**
 (4WW allocation)

**Aeronautical
 (GADSS needs)**



1.10

Satellite issues
 (BSS/FSS @12 GHz,
 ESIM, regul. for N-GSO
 FSS @ 37.5 to 51.4 GHz)



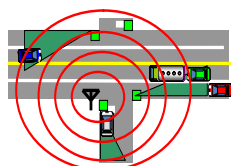
1.4, 1.5, 1.6

Regulatory issues

(Sat. regulations,
 harmonization of
 spectrum use, etc.)

7 (incl. 11 issues)
 8

*Plus issues on other standing agenda items:
 2, 4, 9.1 (incl. 10 issues), 9.2, 9.3 and 10*

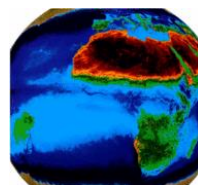


- 1.11
- 1.12



**New Transport
 systems**
 (harmonized bands
 for railways, ITS)

- 1.2
- 1.3
- 1.7



**Earth resources &
 Climate monitoring**
**Weather forecast,
 DCS improvement, TT&C for
 N-GSO Sat. of short duration**





Access to WRC-19 outcomes

www.itu.int/go/wrc-19

World Radiocommunication Conference 2019 (WRC-19), Sharm el-Sheikh, Egypt, 28 October to 22 November 2019



YOU ARE HERE HOME > ITU-R > CONFERENCES AND MEETINGS > WRC > WRC-19

SHARE



WRC-19 documents

About WRCs

WRC-19 Homepage

Registration to RA-19 and WRC-19:

- Delegate registration
- Media accreditation

Host Country website

WRC-19 Documents and Proposals

Preparation of proposals for the work of WRC-19

Practical Information for Participants

- WRC Security Briefing
- Local Transportation

▸ [Final Acts](#)

▸ [Minutes of the Plenary Meetings](#)

▸ [Contributions \(C\)](#)

▸ [WRC-19 Proposal Management System](#) - This tool provides an easy-to-use web access to the proposals for the work of the Conference

▸ [Temporary Documents \(DT\)](#)

▸ [Information Documents \(INFO\)](#) English only

▸ [Administrative Documents \(ADM\)](#) English only

▸ [WRC-19 SharePoint](#)

▸ [Other Documents and Electronic Resources](#)

Quick Links

- [Webcast](#)
- [Captioning](#)
- [WRC-19 SharePoint](#)



WRC-19 News

Invitation Letters and Credentials

Contacts



▸ How Mexico seeks to connect its rural citizens better: Arturo Robles (VIDEO)

05 February 2020

▸ WRC-19: Enabling global radiocommunications for a better tomorrow

02 December 2019

▸ WRC-19 identifies additional frequency bands for 5G

22 November 2019

▸ WRC-19 identifies additional frequency bands for High Altitude Platform Station systems

22 November 2019

▸ ITU Members agree to new milestones for non-geostationary satellite deployment

20 November 2019

Special ITU News Magazine
WRC-19 Key Outcomes

WRC-19 Final Acts

Minutes of the Plenary Meetings

WRC-19 Documents (Proposals, White, White Series, Blue, Pink)

Proposal (+ Doc.) Management System

Access to all other documents, incl. TD, Blue and Pink series



Other outcomes and follow-up

WRC-19 Final Acts

<https://www.itu.int/pub/R-ACT-WRC.14-2019/en>

ITU Council 2020 documents on
WRC-19 and WRC-23

(see Council Doc. [C20/56](#) and [C20/55](#) respectively)

See relevant new and future BR Circular Letters at:

www.itu.int/md/R00-CR-CIR/en

Circulars

	Number	Title
<input type="checkbox"/>	[456]	WRC-19 decisions included in the Minutes of Plenary meetings
<input type="checkbox"/>	[455]	Implementation of Resolution 559 [COM5/3] (WRC-19)



WRC-19 Proposal (+Doc.) Management System

www.itu.int/net4/Proposals/WRC19/Main

WRC-19

See Report of the CPM

Full Text Search



Filtering

May also be used to display CPM Report regulatory examples

Export content(s)

Export results

970 documents, 5811 proposals

Overall numbers of issued documents with proposals* (*incl. typically ADD/MOD/SUP/NOC on RR provisions)

English >	Agenda Item	Action	Source	Doc. Number	Proposal	Provision/Reference	Mapping	Destination	Received	Properties	
		1.13	MOD	AHGPL4A	544	4	5.338A	Vol.1/Chp. II	COM7	11/21/2019	
		1.13	MOD	B61	556	1	5.338A	Vol.1/Chp. II	PLEN	11/21/2019	
		1.6	MOD	B60	555	1	5.338A	Vol.1/Chp. II	PLEN	11/21/2019	
		1.8	MOD	AHGPL4C	529 R1	1	1 610-1 660 MHz	Vol.1/Chp. II	PLEN	11/21/2019	
		1.8	ADD	AHGPL4C	529 R1	2	5.ADJBAND	Vol.1/Chp. II	PLEN	11/21/2019	
		1.8	ADD	AHGPL4C	529 R1	3	5.INBAND	Vol.1/Chp. II	PLEN	11/21/2019	
		1.8	MOD	B61	556	2	1 610-1 660 MHz	Vol.1/Chp. II	PLEN	11/21/2019	
		1.8	ADD	B61	556	3	5.ADJBAND	Vol.1/Chp. II	PLEN	11/21/2019	
		1.8	ADD	B61	556	4	5.INBAND	Vol.1/Chp. II	PLEN	11/21/2019	



WRC-19 PMS filtering (ex. for AI 1.13)

www.itu.int/net4/Proposals/WRC19/Main

WRC-19 See Report of the CPM

Full Text Search

Filtering

Document Type/Color: **Blue**

Agenda Item: 1.13

Action: Any Value

Source: Any Value

Doc. Number (e.g.: 5 A10):

Proposal Number:

Provision:

Mapping: Any Value

Subject: Any Value

Destination: Any Value

Received Since:

Received Before:

Filtering to display only the Blue documents/proposals approved by the Plenary on agenda item 1.13 (IMT)

2 documents, 22 proposals

English >	Agenda Item	Action	Source	Doc. Number	Proposal	Provision/Reference	Mapping	Destination	Received	Properties
	1.13	MOD	B61	556	1	5.338A	Vol.1/Chp. II	PLEN	11/21/2019	
	1.13	MOD	B61	556	7	22-24 75 GHz	Vol.1/Chp. II	PLEN	11/21/2019	



Additional spectrum for IMT

WRC-19 agenda item 1.13

- A **total of 17.25 GHz** of additional spectrum was identified for IMT, in **5 bands**, out of which:
 - **14.75 GHz (86%)** are harmonized on a global basis, in bands:
24.25-27.5 GHz, 37-43.5 GHz and **66-71 GHz**
 - **2.5 GHz** are harmonized on a regional basis or for some countries, in bands:
45.5-47 GHz and **47.2-48.2 GHz**
- For the IMT systems in **24.25-27.5 GHz**, **Res. 750 (Rev. WRC-19)** specified the **limits of unwanted emission power levels** to protect systems in the **Earth exploration-Satellite Service (passive)** in **23.6-24.0 GHz**, in a two-step approach:
 - Before 1 September 2027: **-33/-29 dBW/200 MHz** for base/mobile station
 - After 1 September 2027: **-39/-35 dBW/200 MHz** for base/mobile station
- In band **66-71 GHz**, balanced approach between IMT and other WAS applications: ADMs may **implement IMT** or **consider coexistence** between IMT & these applications
- NOC in other 6 bands which were under consideration:
31.8-33.4 GHz, 47-47.2 GHz, 48.2-50.2 GHz, 50.4-52.6 GHz, 71-76 GHz, 81-86 GHz.
- ▶ **WRC-19 new Res. 241, 242, 243 and 244** (ex. COM4/7, COM4/8, COM4/9 and COM4/10 resp.)





Number of countries in Additional spectrum for IMT

WRC-19 agenda item 1.13



Bands identified for IMT GHz (BW)	Region 1 (adm)	Region 2 (adm)	Region 3 (adm)	NOC GHz
24.25-27.5 (3.25)	All	All	All	31.8-33.4
37-43.5 (6.5)	All	All	All	47-47.2
45.5-47 (1.5)	50	1	2	48.2-50.2
47.2-48.2 (1.0)	64	All	7	50.4-52.6
66-71 (5.0)	All	All	All	71-76
				81-86

(adm: number of countries)



Harmonization of IMT bands

below 5 GHz at WRC-15 and at WRC-19

WRC-19 agenda item 8



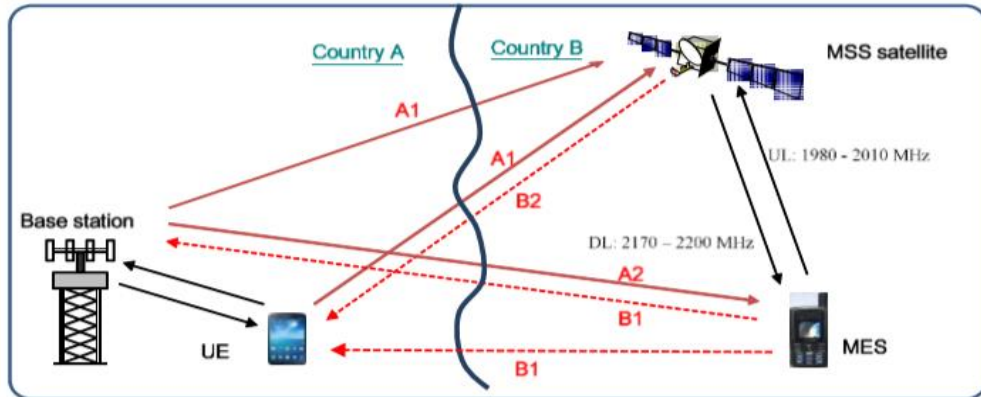
Freq_fm (MHz)	Freq_to (MHz)	BW (MHz)	At WRC-19				At WRC-15			
			adm XR1	adm XR2	adm XR3	adm XAA	adm XR1	adm XR2	adm XR3	adm XAA
614	694	80	0	8	7	15	0	7	7	14
694	698	4	121	8	7	136	121	7	7	135
698	790	92	121	35	27	183	121	35	26	182
3300	3400	100	33	13	7	53	33	6	6	45
3400	3500	100	121	35	16	172	121	35	11	167
3500	3600	100	121	35	13	169	121	35	10	166
3600	3700	100	0	7	0	7	0	4	0	4
4800	4900	100	33	4	6	43	0	1	3	4
4900	4990	90	33	1	6	40	0	0	3	3

(adm: number of countries in Reg. 1, 2, 3 (XR1, XR2, XR3 resp.) and in total (XAA))

Sharing of terrestrial IMT with satellite component and BSS

WRC-19 agenda item 9.1, issues 9.1.1 and 9.1.2

Issue 9.1.1

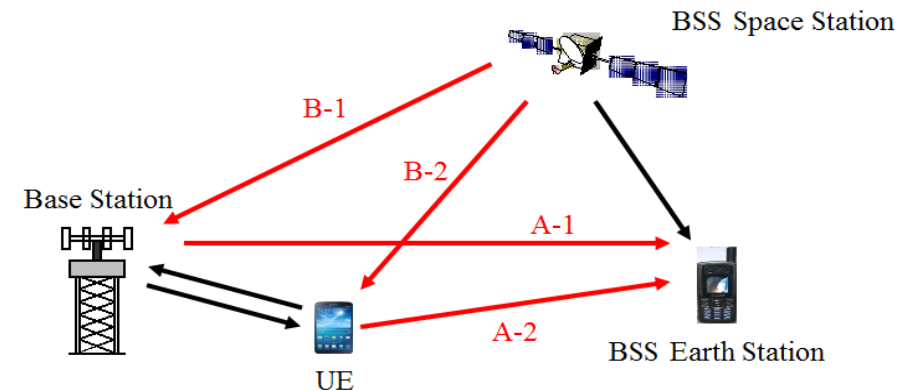


- ▶ **New technical and operational conditions** for operation of IMT terrestrial & satellite components in **1 980-2 010 MHz** and **2 170-2 200 MHz**. Include an **e.i.r.p. limit** for terrestrial stations and **pdf limit** for space transmitters
- ▶ **Res. 212 (Rev. WRC-19)**

- ▶ **New technical conditions & coordination guidelines** for sharing between IMT and BSS (sound) in **1 452-1 492 MHz**, with **pdf limits** on BSS satellite and IMT stations

- ▶ **Res. 761 (Rev. WRC-19)**

Issue 9.1.2



Wireless Access System (WAS/RLANS)

WRC-19 agenda items 1.16 and 9.1 (issue 9.1.5)

- Change of regulatory conditions for **WAS/RLANS in the band 5 150-5 250 MHz**
 - Allowing the use of **Wi-Fi devices in trains and cars**, which was very much sought by the automotive and railway industries
 - **Indoor usage**, including inside trains, with **maximum mean e.i.r.p. of 200 mW**, and
 - usage **inside automobiles** with **maximum e.i.r.p. of 40 mW**
 - Permits also a **limited deployment of outdoor WAS/RLANS**, with due protection of space services
 - **Controlled/limited outdoor usage** with a maximum mean e.i.r.p. of 200 mW
 - Up to 1 W could be allowed, with e.i.r.p. mask for protection of space receivers
 - The number of higher power outdoor RLANS shall not exceed 2% of total ▶ **Res. 229 (Rev. WRC-19)**
- **No changes for other 4 bands** under consideration **due to sharing constraints:**
5 250-5 350 MHz; 5 350-5 470 MHz; 5 725-5 850 MHz, 5 850-5 925 MHz
- For the **bands 5 250-5 350 MHz & 5 470-5 725 MHz**, clarifications in respective RR No. **5.447F** by which **RLS, EESS (active) and SRS (active)**, and in RR **5.450A** by which **RDS**, shall not impose more stringent conditions upon the **MS** than those in **Res. 229 (Rev. WRC-19)**



High Altitude Platforms (HAPS)

WRC-19 agenda item 1.14

- A **total of 5.25 GHz** of spectrum in **5 bands** are identified for HAPS, out of which:
 - **2.4 GHz** are now harmonized on a global basis, in bands:
31-31.3 GHz, **38-39.5 GHz** (at WRC-19), **47.2-47.5 GHz*/47.9-48.2 GHz***
 - * With modified operational conditions
 - **2.85 GHz** are now harmonized for Region 2, in bands:
21.4-22 GHz and **24.25-27.5 GHz** (both at WRC-19)
- **NOC for 6 GHz** (still 5 countries using the bands 6 440-6 520 MHz / 6 560-6 640 MHz)
- **1 country** added to the many others using the band **27.9-28.2 GHz**
- **Conditions were imposed on HAPS to protect the existing services** (RR footnotes, Res.):
limitations on link direction (uplink/downlink), **category of service** (primary/secondary) and various **technical restrictions** (RR Art. 11, App. 4 and App. 7 have been modified accordingly)
- WRC-19 decisions will
 - **facilitate the development and implementation of HAPS**
 - **enable affordable broadband connectivity and telecommunication services in underserved communities and in rural and remote areas** (incl. mountainous and desert zones), noting that HAPS can also be used for **disaster recovery communications**

High Altitude Platforms (HAPS) (Cont'd)

WRC-19 agenda item 1.14

	21.4-22 GHz	24.25-27.5 GHz	27.9-28.2 GHz	31.0-31.3 GHz	38-39.5 GHz	47.2-47.5 GHz and 47.9-48.2 GHz
	Resolution 165 (WRC-19)	Resolution 166 (WRC-19)	Resolution 145 (Rev.WRC-19)	Resolution 167 (WRC-19)	Resolution 168 (WRC-19)	Resolution 122 (Rev.WRC-19)
Region 1				↓:↑	↓:↑	↓:↑
Region 2	↓	24.25-25.25 GHz ↓ 25.25-27.0 GHz ↑ 27.0-27.5 GHz ↓		↓:↑	↓:↑	↓:↑
Region 3				↓:↑	↓:↑	↓:↑
Countries			↓			

HAPS-to-ground: ↓
ground-to HAPS: ↑

- ▶ **Res. 122 (Rev.WRC-19), Res. 145 (Rev.WRC-19) and**
- ▶ **WRC-19 new Res. 165, 166, 167 and 168 (ex. COM4/3, COM4/4, COM4/5 and COM4/6 resp.)**



Transport communications

FS & MS applications in 275-450 GHz

WRC-19 agenda items 1.11, 1.12 and 1.15

1.11 Railway radiocommunications between train and trackside (**RSTT**)



▶ **WRC-19 new Resolution 240** (ex. COM4/2) inviting the **ITU-R** to **continue** the **development of spectrum harmonization** of RSTT in existing mobile service allocations via ITU-R Recommendations and Reports

1.12 Spectrum harmonization for Intelligent Transport Systems (**ITS**)



▶ **WRC-19 new Recommendation 208** (ex. COM4/1) encouraging the **use of globally or regionally harmonized frequency bands for evolving ITS**

Will contribute to connection of vehicles, improvement of traffic management and safe driving

1.15 **Identification of bands** 275-296 GHz, 306-313 GHz, 318-333 GHz & 356-450 GHz

for **land mobile and fixed services applications**. Other bands within 275-450 GHz may only be used subject to **specific conditions to protect EESS (passive)**.

Protection of radio astronomy ensured by specific conditions (e.g. minimum separation distances and/or avoidance angles) in **Res. 731** (rev.WRC-19)

Enabling future
high data rate
wireless systems
(>100 Gbit/s)



Amateur, Maritime and Aeronautical issues

WRC-19 agenda items 1.1, 1.8, 1.9.1, 1.9.2, 1.10 and 9.1 (issue 9.1.4)



1.1 Allocated **50-52 MHz** band in **Reg. 1** to **amateur service** on a **secondary basis**
 ▶ completed partial **spectrum harmonization** throughout the 3 Regions

GMDSS



1.8 a) Authorized usage of **NAVDAT*** in bands **415-495 kHz** and **505-526.5 kHz** and **6 HF channels** in RR App. 17 for **NAVDAT** in maritime mobile service
 * Navigational data
 b) Allocation to **maritime MSS** was **upgraded (1621.35-1626.5 MHz)** to **expand the provision of a truly global maritime distress and safety system**



1.9.1 **Limitation** of Autonomous Maritime Radio Devices (**AMRD**) frequencies to **specific channels**
 ▶ Operation of two groups* of AMRDs is regulated, thus **enhancing safety at sea**
 * *Group A*: those enhancing safety of navigation; *Group B*: others



1.9.2 ▶ Secondary allocations to **NGSO MMSS** (↓&↑links) enabling **VDES sat. component** and the **implementation of complete VHF Data Exchange System concept**



1.10 **No RR changes for GADSS.** WRC-23 will review outdated aeronautical RR provisions.
 ▶ **New WRC-19 Res. 427 (ex.COM4/1)**

9.1.4 **No RR change for sub-orbital vehicles.** Studies continue for WRC-23 agenda item 1.6

Non-GSO satellites systems

WRC-19 agenda items 1.6 and 7 (issue A)

1.6 Clarifications of the regulatory framework for non-GSO satellite systems in bands between 37.5 GHz and 51.4 GHz

▶ WRC-19 new Res. 769, 770 & 771 (ex. COM5/10, COM5/11 & COM5/12 resp.)

7(A) New regulatory framework, including the bringing into use and a milestone-based approach for the deployment of non-GSO satellite constellations in specific frequency bands and services



- non-GSO systems will have to **deploy 10% of their constellation within 2 years** after the end of the current regulatory period for bringing into use, **50% within 5 years**, and **complete the deployment within 7 years**.

This approach will help ensure that the MIFR is aligned with the actual deployment of non-GSO satellite systems and

- will **enable mega constellations of satellites** (hundreds to thousands of spacecraft) to rapidly come to fruition, ensuring operation of as many systems as possible
- will ensure more affordable means of connectivity to rural and remote areas, providing innovative solutions to **bridging the digital divide** as well as providing **broadband for all**

▶ WRC-19 new Res. 35 (ex. COM5/7)



BSS & FSS Plans and ESIM

WRC-19 agenda items 1.4, 1.5 and 7 (issue E)

1.4 New GSO orbital slots opened up in the Reg. 1&3 BSS Plan with a “special procedure” including temporary regulatory measures (as of 23 March and until 21 May 2020) and which **can only be applied once**, in order to provide **priority to countries** that:

- **have no assignments in the List or submitted under Article 4 of RR Appendix 30;**
- **have assignments in the Plan with degraded reference situation.** ▶ **WRC-19 new Res. 558, 559 & 768** (ex. COM5/2, COM5/3 & COM5/4 resp.)

7(E) New “Special Procedure”, applicable only once, to **facilitate entry** into the **Appendix 30B FSS List**, for **countries** that have **no assignments in the List or submitted under App. 30B Art. 6.**

▶ **WRC-19 new Res. 170** (ex. COM5/8)

▶ **Ensure equitable access to the spectrum & orbit resources** by providing **protection of assignments** and a **priority mechanism for countries to regain access to these resources**



1.5 New regulatory, operational and technical conditions under which the frequency bands **17.7-19.7 GHz & 27.5-29.5 GHz** can be used by **ESIM*** communicating with **GSO FSS**

- ▶ For the use & further development of ESIMs, enabling **connection of people on ships, aircraft and land vehicles** and ensuring their safety, security and comfort while in motion

* Earth Station In Motion

▶ **WRC-19 new Res. 169** (ex. COM5/6)

Other satellite issues

WRC-19 agenda items 1.2, 1.7, 7 (issue I) and 9.1 (issues 9.1.7 & 9.1.9)

1.2 Establishment of **maximum e.i.r.p. for any emissions of**

- **MSS earth stations** in the band **399.9-400.05 MHz** (with some restrictions of application until 22 Nov. 2022), **except for** telecommand uplinks within the MSS in the band **400.02-400.05 MHz**
- **MetSat & EESS earth stations** in the band **401-403 MHz** (with some restrictions of application until 22 November 2029)

7(I) New **WRC-19 Res. 32 (ex.COM5/5)** on **Regulatory procedures for frequency assignments to non-GSO satellite** networks or systems identified as **short-duration mission** not subject to the application of Section II of Article 9

1.7 New **WRC-19 Res. 660 (ex.COM5/9)** on the **Use of the frequency band 137-138 MHz by non-GSO satellites with short-duration missions in the space operation service**

9.1.7 New **WRC-19 Res. 22 (ex.COM5/1)** on Measures to limit **unauthorized uplink transmissions from earth stations**

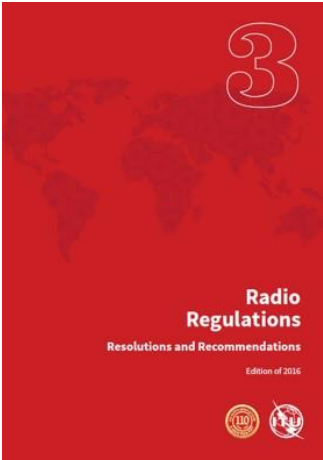
9.1.9 Allocate the band **51.4-52.4 GHz** to the **FSS (Earth-to-space)** limited to

- **gateway earth stations larger than 2.4 meters and**
- **communicating with GSO satellites.**

▶ **One GHz extension of the current allocation in the 50.4-51.4 GHz band**

Review of W(A)RC Res. & Rec.

WRC-19 agenda item 4

- 
- Modification of 30 Resolutions and 7 Recommendations to take into account results of requested activities and outdated references, including updating of **Res. 155** (UAS CNPC links), **Res. 647** (emergencies and disasters) and clarifications on **Res. 750** (protection of EESS)
 - Modification of **Res. 95** to **clarify the procedure for implementing this agenda item (including at CPM)**

Review of Country footnotes in RR Article 5

WRC-19 agenda item 8

- 
- SUP of several country names ► **higher harmonization of the spectrum use**
 - ADD of country names to some footnotes to recognize specific national uses
 - Modification of **Res. 26** to **include guidance on the approach taken at previous WRCs for implementing this agenda item**, in particular with respect to proposals to add country names to existing footnote, while recognizing that it is **not the intention of WRCs to encourage the addition of country names to existing footnotes**

Topics on the WRC-23 Agenda






WRC-19 agenda item 10

WRC-23 agenda

1.1 **Mobile** **3.3 ≤ MS & IMT ≤ 10.5 GHz**

1.2 **1.3** **1.4** **1.5** **Broadcasting** **0.694 ≤ HIBS ≤ 2.7 GHz**

470 ≤ BS, MS ≤ 960 MHz

Spaceborne radar sounders (2ndary)

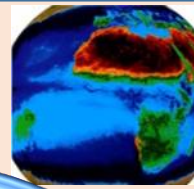


EESS (active) @ 45 MHz

SRS @ 14.8-15.35 GHz

Remote-sensing observation requirements - EESS (passive) @ 231.5-252 GHz

Science

1.12 **1.13** **1.14**

1.6 **Aviation** **Sub-orbital vehicles**






1.7 **1.8** **1.9** **1.10** **1.11** **Maritime** **New AMS(R)S VHF alloc.**

UAS CNPC links via FSS

Dig. techno. for aviation safety-of-life applications (App.27)

New AMS alloc. (around 15.5 & 22 GHz) for non-safety applications

GMDSS modernization and e-navigation

A-ESIM & M-ESIM (GSO Ku-FSS)

ESIM (NGSO Ka-FSS)

ISS / Sat.-to-Sat. links

NB MSS for IoT (L/S-bands)

Ka-FSS (s-E) (R2)

Satellite regulatory issues

7

Satellite







Note: WRC-23 agenda item numbers indicated in italic

► 19 specific and 11 standing items, see Res. 811 (WRC-19)

Fixed, Mobile and Broadcasting issues

WRC-23 agenda items 1.1 to 1.5

- 1.1 ➤ In the band **4 800-4 990 MHz** (identified for IMT in about 40 countries), consider the pfd criteria in No. **5.441B** for the **protection of stations of the aeronautical and maritime mobile services** located in international airspace and waters from **other stations located within national territories** ➤ **Res. 223 (Rev.WRC-19)**
- 1.2 ➤ Consider the **identification for IMT** of the following frequency bands: **3 300-3 400 MHz** (sub-Reg.1 & Reg.2), **3 600-3 800 MHz** (Reg.2), **6 425-7 025 MHz** (Reg.1), **7 025-7 125 MHz** (globally) and **10.0-10.5 GHz** (Reg.2) ➤ **Res. 245 (WRC-19)**
- 1.3 ➤ Consider a **primary allocation** of the band **3 600-3 800 MHz** to the **mobile service** within **Region 1** ➤ **Res. 246 (WRC-19)**
- 1.4 ➤ Consider use of **high-altitude platform stations as IMT base stations (HIBS)** in the **mobile service** in certain frequency bands **below 2.7 GHz*** **already identified for IMT**, on a global or regional level ➤ **Res. 247 (WRC-19)**
-  * studies of bands **694-960 MHz**, **1 710-1 885 MHz** (1 710-1 815 MHz for ↑ only in Reg. 3), **2 500-2 690 MHz** (2 500-2 535 MHz for ↑ only in Reg. 3, except 2 655-2 690 MHz in Reg. 3)
- 1.5 ➤ Review the **spectrum use** and **spectrum needs** of **existing services** in **470-960 MHz** in **Region 1** and Consider **regulatory actions** in **470-694 MHz** in **Region 1** ➤ **Res. 235 (WRC-15)**



Aeronautical and Maritime issues

WRC-23 agenda items 1.6 to 1.11

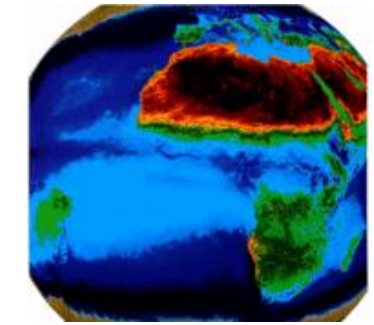
- 1.6 ➤ Consider regulatory provisions to facilitate **radiocommunications for sub-orbital vehicles** ▶ **Res. 772 (WRC-19)**
- 1.7 ➤ Consider **AMS(R)S allocation** for both the E-s & s-E directions of **aeronautical VHF communications in all or part of the frequency band 117.975-137 MHz** ▶ **Res. 428 (WRC-19)**
- 1.8 ➤ Review and, if necessary, revise **Res. 155 (Rev.WRC-19) & No. 5.484B** to accommodate the **use of FSS networks by control and non-payload communications of unmanned aircraft systems** ▶ **Res. 171 (WRC-19)**
- 1.9 ➤ Review Appendix **27**, to accommodate **digital technologies for commercial aviation safety-of-life applications** in **existing HF bands** allocated to the **AM(R)S** and ensure coexistence of current and modernized HF systems ▶ **Res. 429 (WRC-19)**
- 1.10 ➤ Consider **spectrum needs**, for possible **new AMS allocations** for **non-safety aeronautical mobile applications** ▶ **Res. 430 (WRC-19)**
- 1.11 ➤ Consider possible **regulatory actions** to support the **modernization of the GMDSS** and **implementation of e navigation** ▶ **Res. 361 (Rev.WRC-19)**



Science issues

WRC-23 agenda items 1.12 to 1.14

- 1.12 ➤ Consider new **secondary allocation** to the **EESS (active) service** for **spaceborne radar sounders** within the range of frequencies **around 45 MHz** ▶ **Res. 656 (Rev.WRC-19)**



- 1.13 ➤ Consider to **upgrade of the allocation** of the frequency band **14.8-15.35 GHz** to the **space research service** ▶ **Res. 661 (WRC-19)**

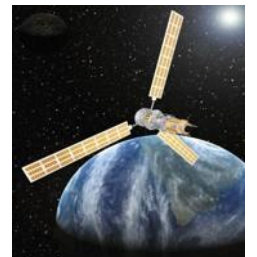
- 1.14 ➤ Consider possible adjustments of the existing or possible new primary **frequency allocations to EESS (passive)** in the frequency range **231.5-252 GHz**, to ensure alignment with more up-to-date **remote-sensing observation requirements** ▶ **Res. 662 (WRC-19)**



Satellite issues

WRC-23 agenda items 1.15 to 1.19

- 1.15 ➤ Consider the use of the band **12.75-13.25 GHz** (E-s) by **earth stations on aircraft and vessels** communicating with **GSO** space stations in the **FSS globally** ➤ **Res. 172 (Rev.WRC-19)**
- 1.16 ➤ Consider the use of the bands **17.7-18.6 GHz** and **18.8-19.3 GHz** and **19.7-20.2 GHz** (s-E) and **27.5-29.1 GHz** and **29.5-30 GHz** (E-s) by **non-GSO FSS** earth stations in motion (ESIM) ➤ **Res. 173 (WRC-19)**
- 1.17 ➤ Consider **inter-satellite links** in specific frequency bands*, or portions thereof, by adding an inter-satellite service allocation where appropriate ➤ **Res. 773 (WRC-19)**
* (ISS/s-s) **11.7-12.7 GHz**, **18.1-18.6 GHz**, **18.8-20.2 GHz** and **27.5-30 GHz**
- 1.18 ➤ Consider **spectrum needs** and potential **new MSS allocations*** for future development of **narrowband MSS systems** ➤ **Res. 248 (WRC-19)**
* in the bands **1 695-1 710 MHz** (R2), **2 010-2 025 MHz** (R1), **3 300-3 315 MHz** and **3 385-3 400 MHz** (R2)
- 1.19 ➤ Consider new **primary allocation** to the FSS (s-E) direction in the frequency band **17.3-17.7 GHz** in **Region 2** ➤ **Res. 174 (WRC-19)**





Other topics to be studied

WRC-23 agenda item 9.1

- Consider technical and operational characteristics, spectrum requirements and appropriate radio service designations for **space weather sensors** with a view to describing **appropriate recognition and protection in the Radio Regulations** without placing additional constraints on incumbent services
- Consider **amateur service and the amateur-satellite service** allocations in the frequency band **1 240 1 300 MHz** to determine if **additional measures** are required to **ensure protection of the RNSS (s-E)** operating in the same band
- Study the **use of IMT system for fixed wireless broadband** in the frequency bands **allocated to the fixed services** on primary basis

Additional topic identified at CPM23-1

- **Protection of EESS (passive)** in the frequency band **36-37 GHz** from **non-GSO FSS space stations**



WRC-27 Preliminary Agenda

WRC-23 agenda item 10

▶ **see Res. 812 (WRC-19)**

- 2.1 ▶ Consider **additional RLS spectrum allocations** on a co-primary basis in the band **231.5-275 GHz** and **identification for RLS applications** in bands in the range **275-700 GHz** for millimetre and sub-millimetre wave **imaging systems** ▶ **Res. 663 (WRC-19)**
- 2.2 ▶ Consider the technical, operational and regulatory measures, as appropriate, to facilitate the **use of the bands 37.5-39.5 GHz (s-E), 40.5-42.5 GHz (s-E), 47.2-50.2 GHz (E-s) and 50.4-51.4 GHz (E-s)** by **aeronautical and maritime earth stations in motion (ESIM)** communicating with **GSO FSS** space stations ▶ **Res. 176 (WRC-19)**
- 2.3 ▶ Consider the allocation of all or part of the frequency band **[43.5-45.5 GHz]** to the **fixed-satellite service** ▶ **Res. 177 (WRC-19)**
- 2.4 ▶ Consider the introduction of **pdf and e.i.r.p. limits in Article 21** for the frequency bands **71-76 GHz** and **81-86 GHz** ▶ **Res. 775 (WRC-19)**
- 2.5 ▶ Consider conditions for the use of the **71-76 GHz** and **81-86 GHz** bands by stations in the **satellite services** to ensure **compatibility with passive services** ▶ **Res. 776 (WRC-19)**
- 2.6 ▶ Consider regulatory provisions for recognition of **space weather sensors** and their protection in the RR, taking into account the results of ITU R studies reported to **WRC-23 under agenda item 9.1** ▶ **Res. 657 (Rev.WRC-19)**



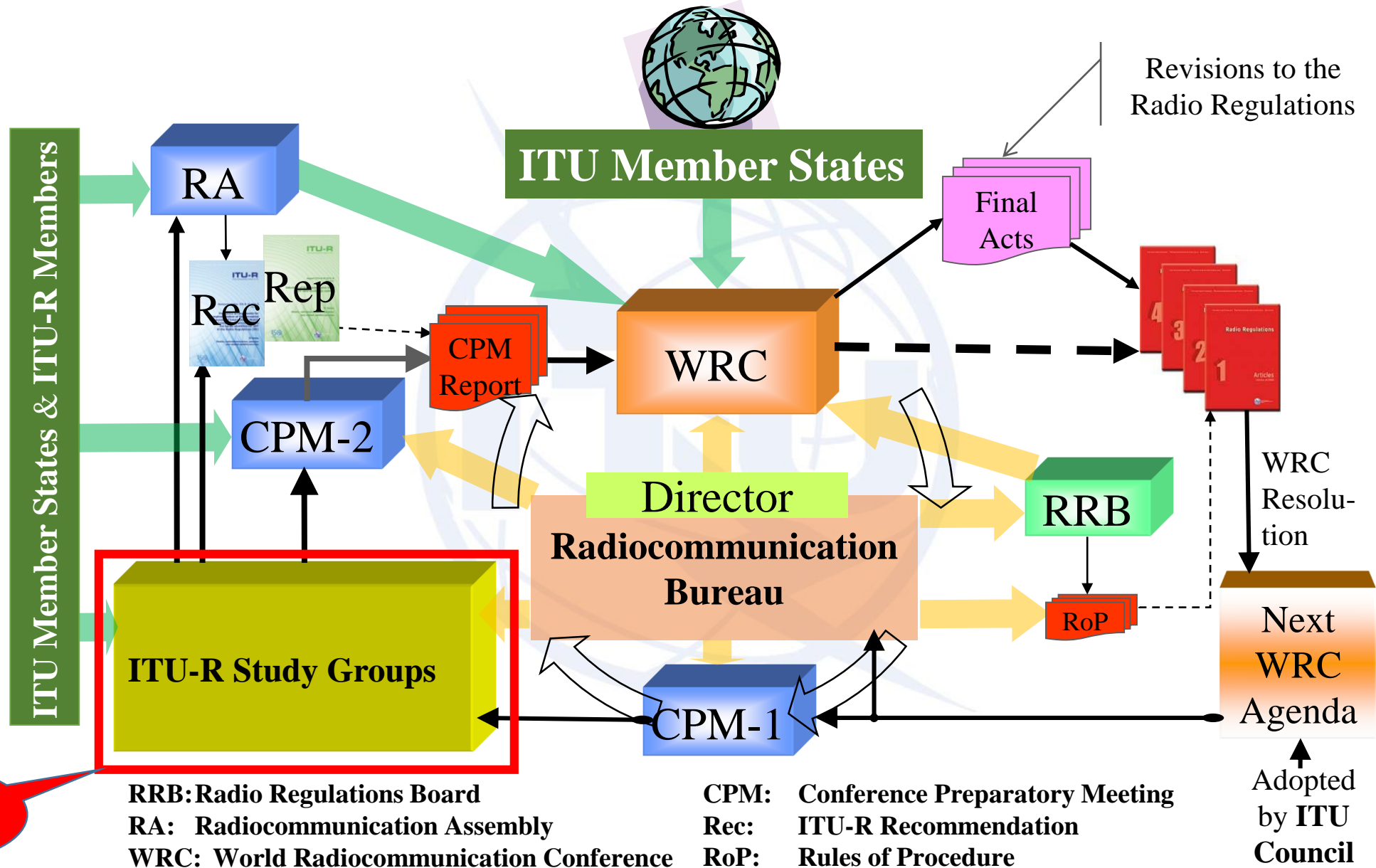
WRC-27 Preliminary Agenda (cont'd)

WRC-23 agenda item 10

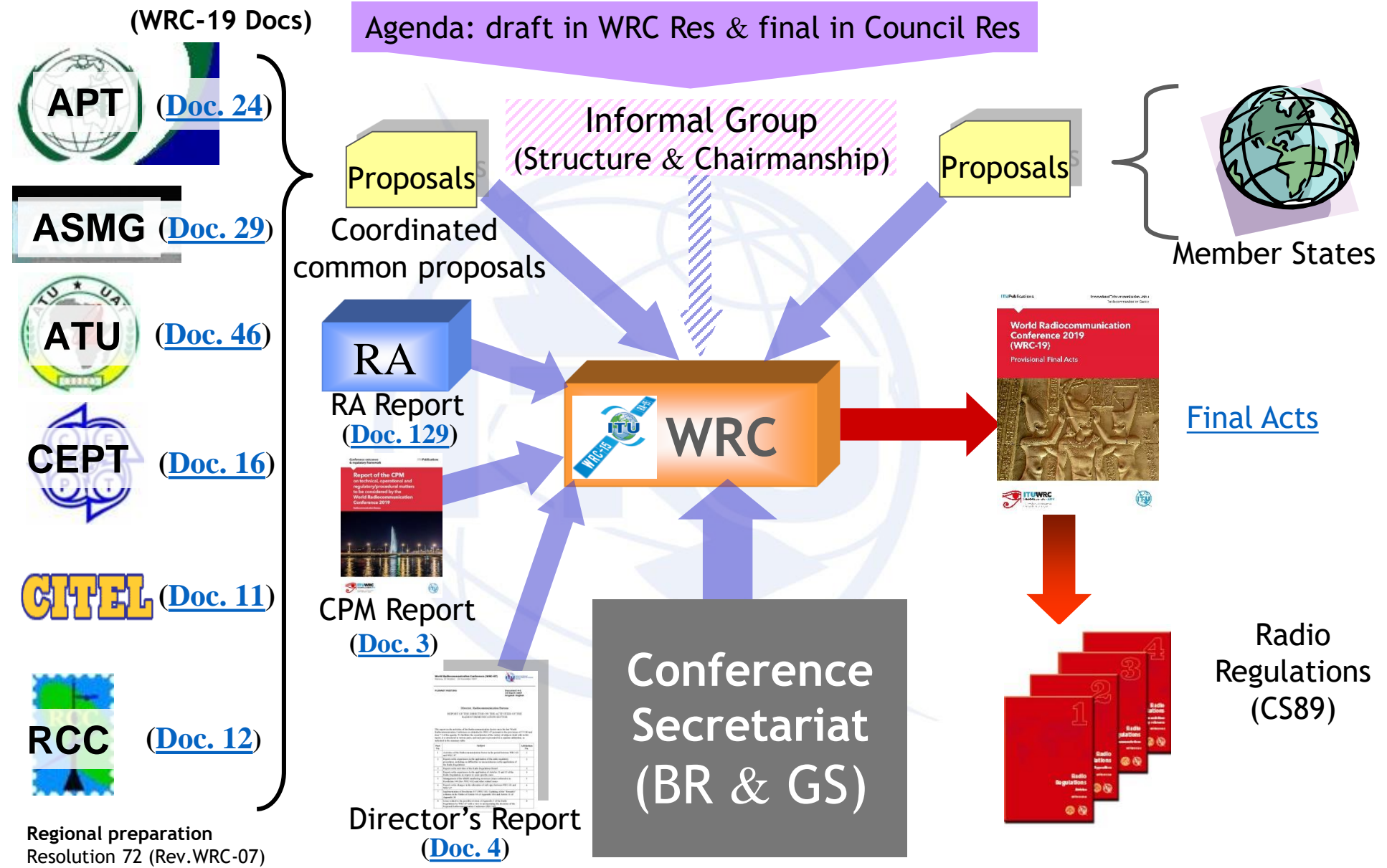
▶ **see Res. 812 (WRC-19)**

- 2.7 ➤ Consider **NGSO FSS system feeder links** in the bands **71-76 GHz** (space-to-Earth and proposed new Earth-to-space) and **81-86 GHz** (Earth-to-space) ▶ **Res. 178 (WRC-19)**
- 2.8 ➤ Consider **space-to-space links** in the bands **[1 525-1 544 MHz]**, **[1 545-1 559 MHz]**, **[1 610-1 645.5 MHz]**, **[1 646.5 1 660.5 MHz]** and **[2 483.5-2 500 MHz]** among **NGSO and GSO satellites** operating in the **MSS** ▶ **Res. 249 (WRC-19)**
- 2.9 ➤ Consider spectrum allocations to the **MS** in the band **1 300-1 350 MHz** to facilitate the **future development of mobile-service applications** ▶ **Res. 250 (WRC-19)**
- 2.10 ➤ Consider **improving the utilization** of the **VHF maritime frequencies** in Appendix **18** ▶ **Res. 363 (WRC-19)**
- 2.11 ➤ Consider **new EESS (Earth-to-space) allocation** in the band **22.55-23.15 GHz** ▶ **Res. 664 (WRC-19)**
- 2.12 ➤ Consider **use of existing IMT identifications** in the frequency range **694-960 MHz** by consideration of the possible **removal of the limitation regarding aeronautical mobile** in the IMT for the **use of IMT user equipment by non-safety applications**, where appropriate ▶ **Res. 251 (WRC-19)**
- 2.13 ➤ Consider a possible **worldwide allocation** to the **MSS** for the **future development of narrowband mobile-satellite systems** in the range **[1.5-5 GHz]** ▶ **Res. 248 (WRC-19)**

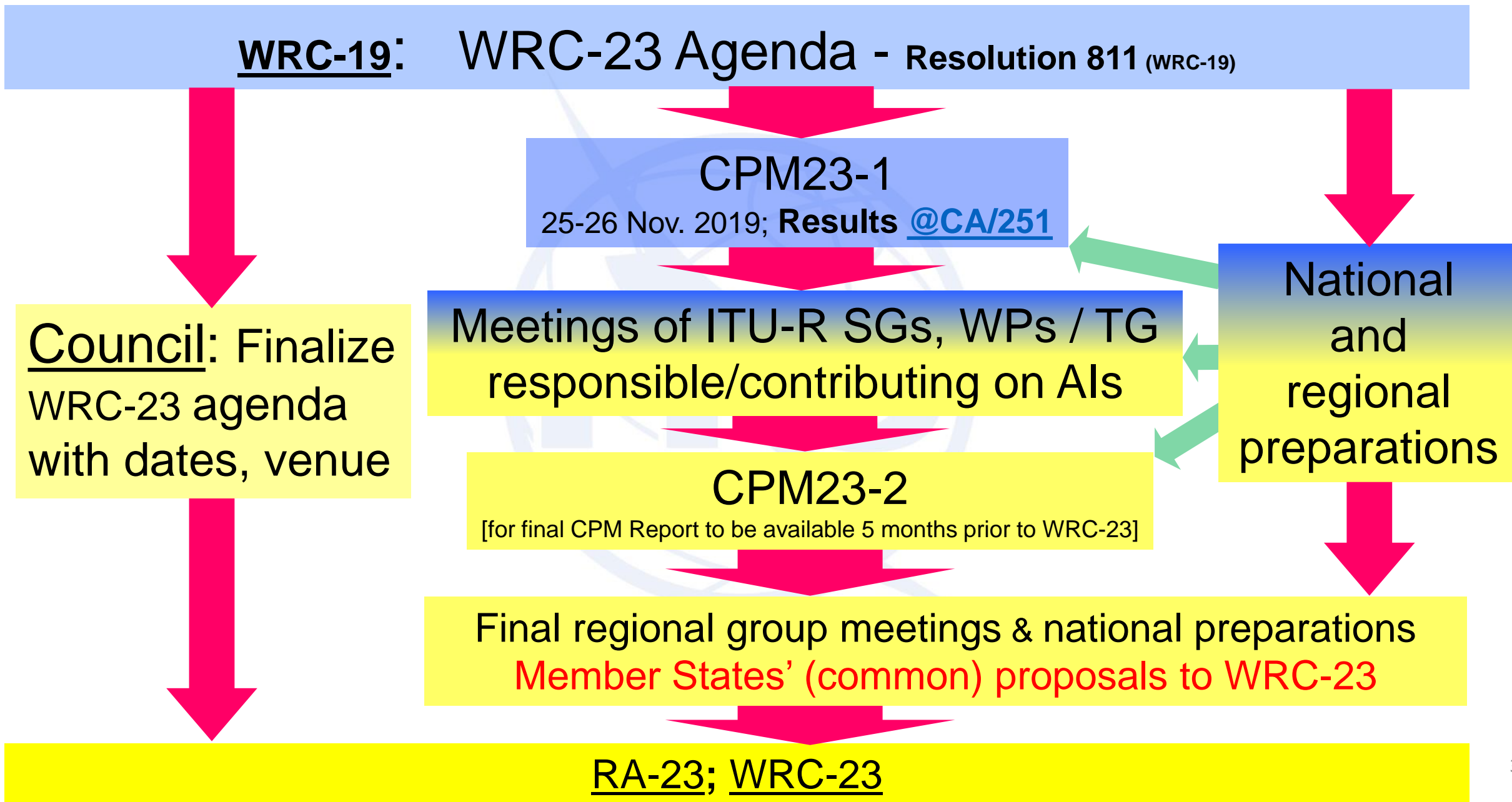
The WRC Cycle



The WRC Process



Main Steps towards WRC-23



www.itu.int/ITU-R/go/rcpm

Chairman

Ms. C.-L. COOK (CAN)

Emails

cindycook.itu@gmail.com

Vice-Chairmen, CPM

Dr. M. A. ABAGA ABESSOLO (GAB)

michelabaga1@yahoo.fr

Dr. M. A. EL-MOGHAZI (EGY)

mmoghazi@tra.gov.eg

Mr. A. KÜHN (D)

alexander.kuehn@bnetza.de

Dr. J. LIM (KOR)

jwlim@korea.kr

Mr. S. PASTUKH (RUS)

serg-past@mail.ru;
sergey.sergpast@yandex.ru

Ms. K. ZHU (CHN)

zhukeer@miit.gov.cn;
zhuke@src.org.cn

(see details at www.itu.int/go/ITU-R/cvc/CPM)



First Session of CPM-23

Scope defined in Resolution ITU-R 2-8

- ✓ **Sharm el-Sheikh, EGY, 25-26 Nov. 2019** (330 participants, 73 MS, 11 SM, 11 contributions)
⇒ **results published in CA/251, of 19Dec. 2019**
(see at www.itu.int/md/R00-CA-CIR-0251/en)
- **Define framework of preparatory studies:**
Structure of the draft CPM Report (see the proposed detailed structure at: <https://www.itu.int/oth/R0A0A000014/en>) **with**
five (5) Chapter, one Annex and eight (8) (co-)Rapporteurs
- **Identify responsible ITU-R Groups** for each WRC-23 agenda item (AI) & topics
 - ⇒ 8 existing Working Parties and
 - ⇒ Proposed **new TG 6/1 for AI 1.5** (ToR in Annex 9 of [CA/251](http://www.itu.int/oth/R0A0A000014/en))
 - + 4 existing SGs for the WRC-27 preliminary agenda items**and contributing ITU-R groups**
(see Annexes 7 and 8 to [CA/251](http://www.itu.int/oth/R0A0A000014/en))
- For sharing and compatibility studies, service/application **characteristics & parameters** from contributing WPs are **required by 15 June 2021**
at the latest and unless otherwise specified (e.g. case of TG 6/1 with 15 May 2021)

Overlapping frequency bands between some WRC-23 agenda items

1.2 (IMT) WP 5D	1.16 (non-GSO FSS ESIMs) WP 4A	1.17 (ISL) WP 4A	1.18 (narrowband MSS) WP 4C
3 300-3 400 MHz (Regions 1 & 2)			3 300-3 400 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.

- The responsible groups are invited to **exchange the necessary characteristics, parameters and protection criteria to complete studies addressing mutual compatibility and sharing feasibility** among the applicable services/applications.
- They should **coordinate their work and review**, as appropriate, the **progress of studies so that any potential difficulties can be addressed.**

Draft CPM Report – ToC

(see Annex 6 to [CA/251](#))

<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

CPM Chapter Rapporteurs

<u>Chapters</u>	<u>(Co-)Rapporteurs</u>
1. Fixed, Mobile and Broadcasting issues	Dr. H. ATARASHI (J) for Als 1.1, 1.2 and 1.4 Mr. U.A. MAHMUD (NIG) for Als 1.3 and 1.5
2. Aeronautical and maritime issues	Mr. Mohammed ALHASSANI (UAE)
3. Science issues	Mr. T. A. BAKAUS (B)
4. Satellite issues	Ms. F. Magnier (F) for Als 1.15, 1.16, 1.17, 1.18, 1.19 Mr. G. KWIZERA (RRW) for AI 7
5. General issues	Mr. J. HUANG (CHN) Dr. J. in PARK (KOR)

(see details at www.itu.int/en/ITU-R/study-groups/rcpm/Pages/cpm-23-chp-rapporteurs.aspx)



Structure of the draft CPM texts for an agenda item in a given chapter

(see Annexes 6 and 11 to [CA/251](#))

Chapter N	
Agenda Item 1.XY	
	[Relevant WRC Resolutions if any]
N/1.XY/1	Executive Summary*
N/1.XY/2	Background*
N/1.XY/3	Summary and Analysis of the results of ITU-R studies, including a list of relevant ITU-R Recommendations
N/1.XY/4	Method(s) to satisfy the Agenda Item
N/1.XY/5	Regulatory and procedural considerations

* Not more than half a page of text

Chapter 5 **Agenda Item 9.1(9.1-[x])**

5/9.1-[x] [Title of the topic]
Summary of the results of ITU-R studies

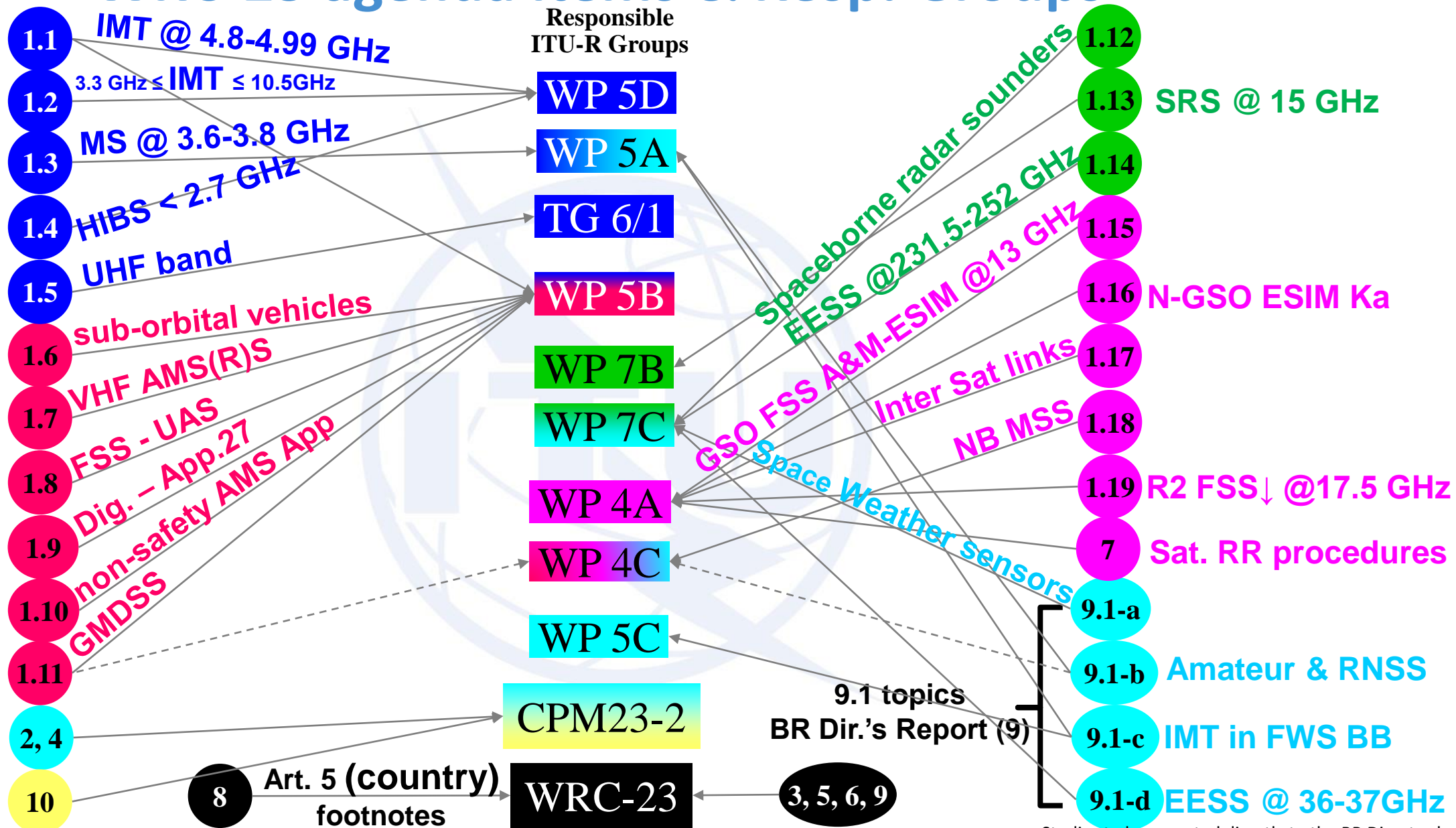
Annex 1 – Information on WRC-23 AI 10

2.[x] [label of the agenda item]
[Text of a short summary of ITU-R studies completed under the preliminary agenda item]

(see the Proposed detailed Structure for the Draft CPM Report to WRC-23 at: www.itu.int/oth/R0A0A000014/en)



WRC-23 agenda items & Resp. Groups

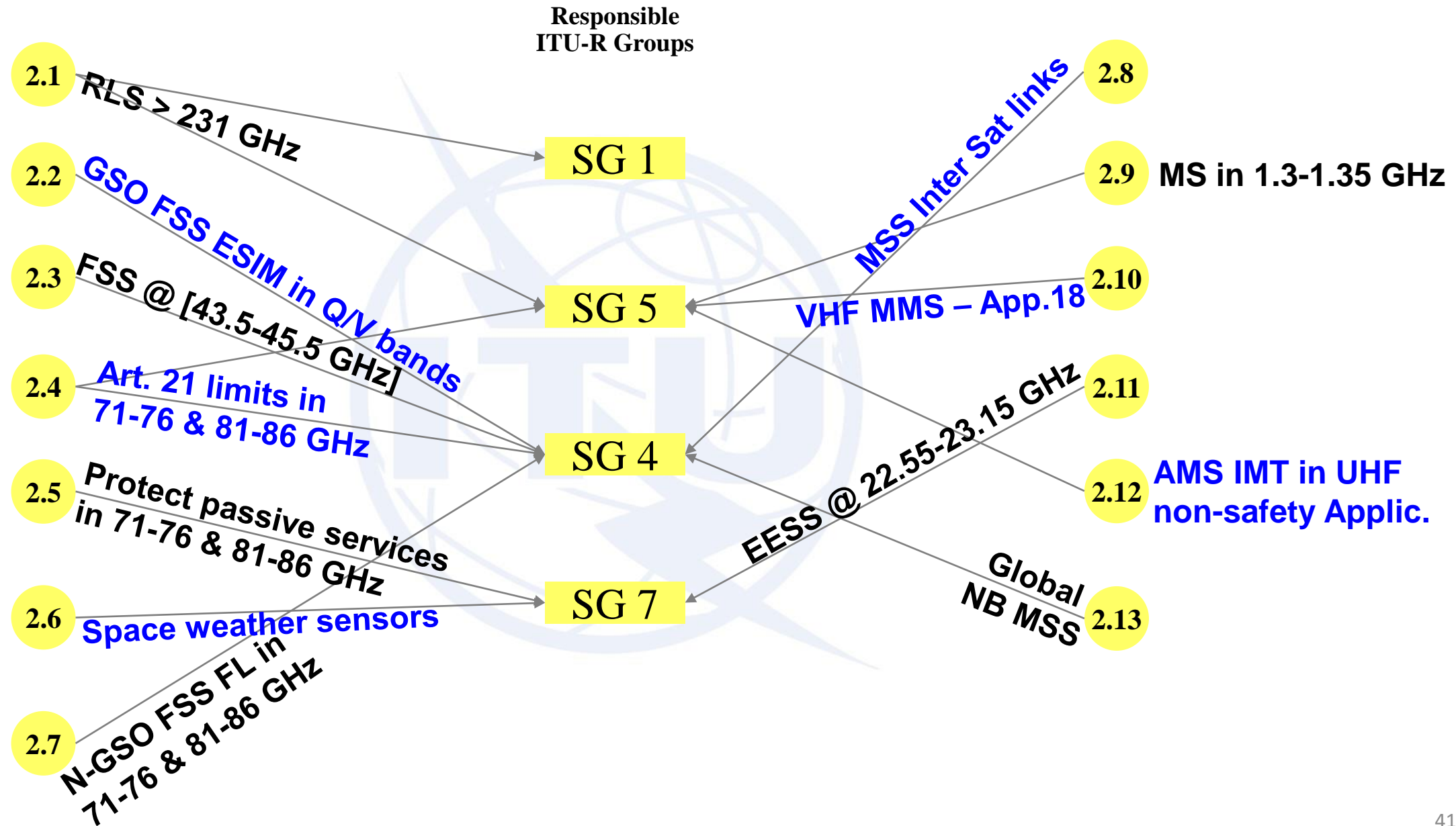


+Studies to be reported directly to the BR Director by:
 - WP 5D on the use of No. 21.5 limit for AAS
 - WP 5B on Res. 427 (WRC-19)

(see Annexes 4, 7 and 10 to [CA/251](#))



WRC-27 preliminary items & Resp. Groups



(see Annexes 8 and 10 to [CA/251](#))

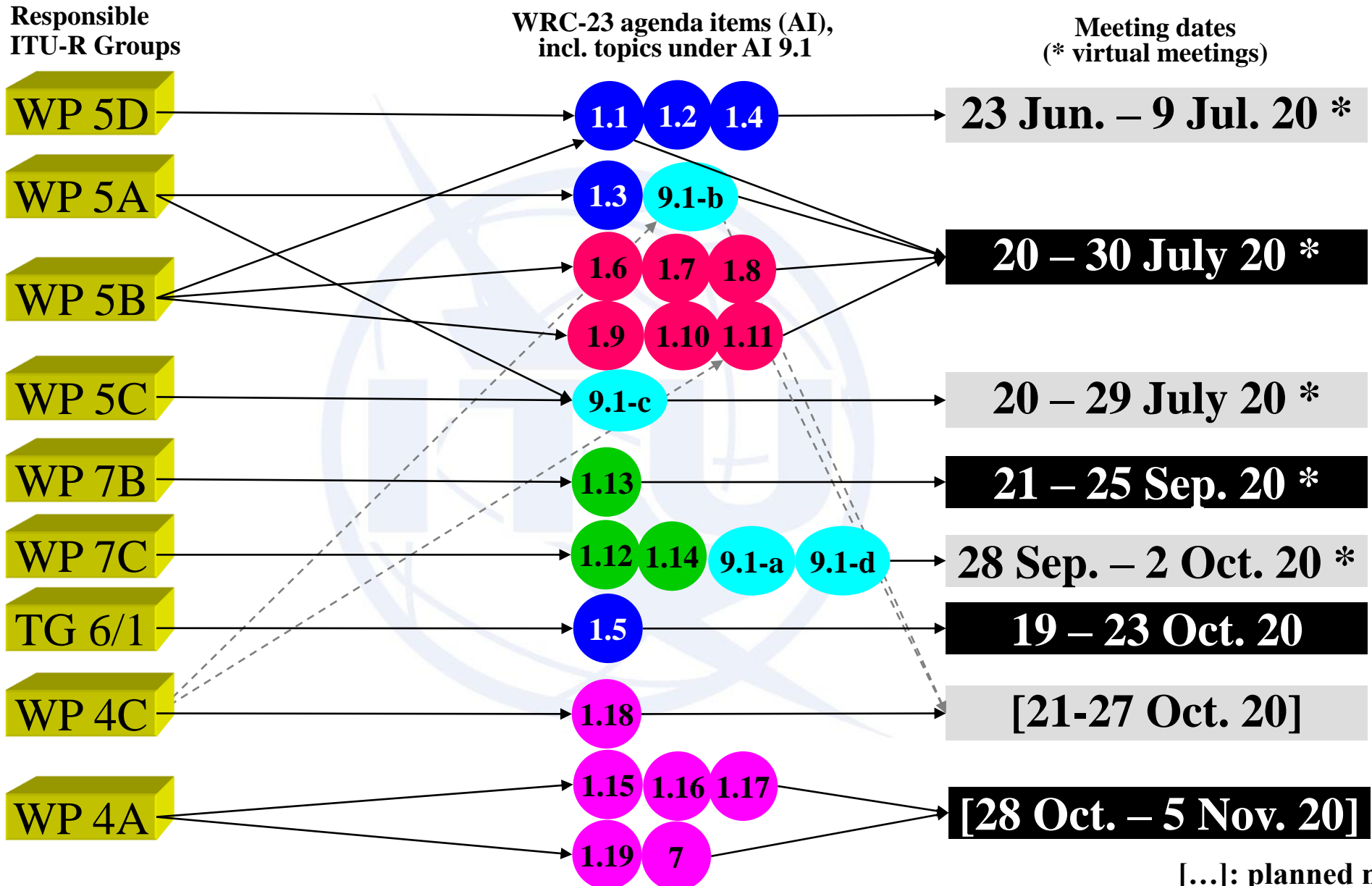


New TG 6/1 on WRC-23 AI 1.5

- ✓ Taking into account **CPM23-1 Decision** (see [CA/226 Annex 9](#)), **SG 6 established new TG 6/1** (www.itu.int/en/ITU-R/study-groups/rsg6/tg6-1)
- ✓ **SG 6 appointed Mr. Sergey PASTUKH as the Chairman**
- ✓ **SG 5 is invited to appoint the Vice-Chairman, who will coordinate the development of the draft CPM text**
- **By 15 May 2021**, in accordance with *resolves to invite ITU-R 1* of Res. 235 (WRC-19), **results of studies on spectrum use and spectrum needs within the band 470-960 MHz should be reported by:**
 - **Working Party (WP) 6A regarding the Broadcasting Service** (including the needs of the countries party to the **GE06 Agreement**)
 - **SG 5 relevant WPs regarding the Mobile (except aeronautical mobile) Service**
- **By 15 May 2021**, **study assumptions** (incl. propagation model, system parameters) **and technical characteristics** including protection criteria of the **services allocated in the band 470-694 MHz should be provided by the WPs***
(* Contributing Working Parties: 3K, 3M, 5A, 5B, 5C, 5D, 6A)
- **TG 6/1 is responsible for conducting the sharing and compatibility studies** (*resolves to invite ITU-R 2 & 3*) **and developing the draft CPM text**
- **CPM23-1 provided also elements for the scheduling of the 5 or 6 meetings of TG 6/1**



Next Meetings of Resp. Groups

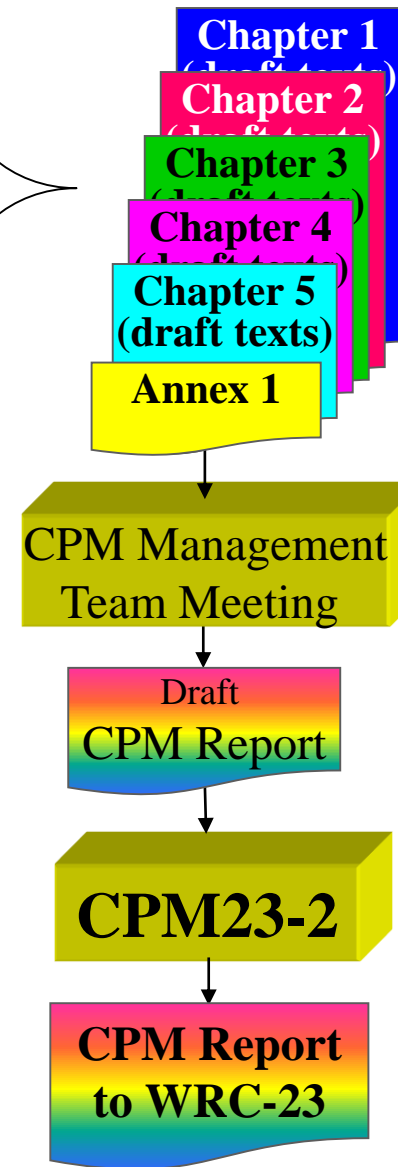
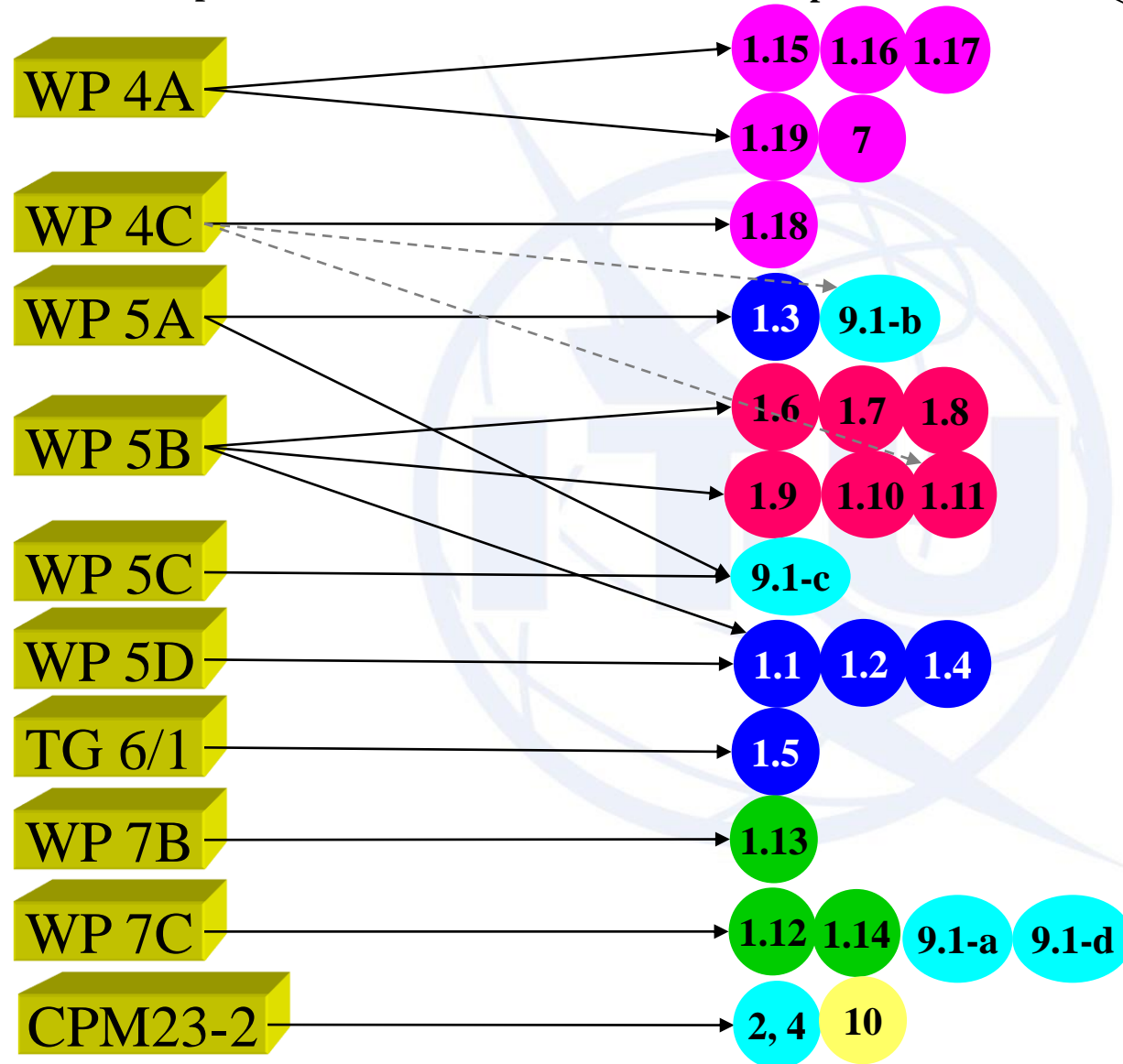


[...]: planned meetings

Summary of CPM Report Preparation

Responsible
ITU-R Groups

WRC-23 agenda items (AI),
incl. topics under AI 9.1



Deadlines and Meeting Dates will be determined, based on WRC-23 dates, taking into account Res. ITU-R 2-8

ITU-R Preparatory Studies for WRC-23

Resolution **811 (WRC-19)** contains the WRC-23 agenda.

www.itu.int/go/rcpm-wrc-23-studies



Webpage to be updated on a regular basis after meetings of the responsible groups

WRC-23 agenda Item (Chapter)	Issue	WRC Resolution (*)	Responsible Group(s)	Information from Responsible Group(s) <small>ITU-R</small>
1		-	-	-
1.1 (1)		Res.223 (Rev.WRC-19)	WP 5B (1) WP 5D (1)	See Administrative Circular CA/251 Doc. 5D/134, Chapter 2 Attachments 2.8 (a) (b) & 2.9 (a) (b), 2.11 (a) & 2.17 (a) & Chapter 4 Sections 2, 3.3, 5, Annex 2 & Attachments 4.4 (a), 4.13, 4.14, 4.15, 4.16 (b)
1.2 (1)		Res.245 (WRC-19)	WP 5D	Doc. 5D/134, Chapter 2 Attachments 2.8 (a) (b) & 2.9 (a) (b), 2.11 (a) & 2.17 (a) & Chapter 4 Sections 2, 3.3, 5, Annex 2 & Attachments 4.4 (a), 4.13, 4.14, 4.17, 4.18 (b)
1.3 (1)		Res.246 (WRC-19)	WP 5A	See Administrative Circular CA/251
1.4 (1)		Res.247 (WRC-19)	WP 5D	Doc. 5D/134, Chapter 2 Attachments 2.8 (a) (b) & 2.9 (a) (b), 2.11 (a) & 2.17 (a) & Chapter 4 Sections 2, 3.3, 5, Annex 2 & Attachments 4.4 (a), 4.13, 4.14, 4.19, 4.20 (b), 4.21 (c) & 4.22
1.5 (1)		Res.235 (WRC-15)	TG 6/1 (2)	See Administrative Circular CA/251
1.6 (2)		Res.772 (WRC-19)	WP 5B (3)	See Administrative Circular CA/251
1.7 (2)		Res.428 (WRC-19)	WP 5B (3)	See Administrative Circular CA/251
1.8 (2)		Res.171 (WRC-19) - Res.155 (Rev.WRC-19)	WP 5B (3)	See Administrative Circular CA/251
1.9 (2)		Res.429 (WRC-19)	WP 5B	See Administrative Circular CA/251
1.10 (2)		Res.430 (WRC-19)	WP 5B	See Administrative Circular CA/251
1.11 (2)		Res.361 (Rev.WRC-19)	WP 5B (4)	See Administrative Circular CA/251
1.12 (3)		Res.656 (Rev.WRC-19)	WP 7C	Doc. 7C/22 Sec. 3.1.5
1.13 (3)		Res.661 (WRC-19)	WP 7B	Doc. 7B/14 Sec. 2.3 & Annexes 1, 2 & 3 (b)
1.14 (3)		Res.662 (WRC-19)	WP 7C	Doc. 7C/22 Sec. 3.1.5
1.15 (4)		Res.172 (WRC-19)	WP 4A	Doc. 4A/30 & Annexes 1 & 2 (b)
1.16 (4)		Res.173 (WRC-19)	WP 4A	Doc. 4A/30 & Annexes 1 & 2 (b)
1.17 (4)		Res.773 (WRC-19)	WP 4A	Doc. 4A/30 & Annexes 1 & 2 (b)
1.18 (4)		Res.248 (WRC-19)	WP 4C	Doc. 4C/30 & Annexes 1 & 2 (b)
1.19 (4)		Res.174 (WRC-19)	WP 4A	Doc. 4A/30 & Annexes 1 & 2 (b)

Information on the regional preparation for WRC-23

www.itu.int/en/ITU-R/conferences/wrc/2023/Pages/reg-prep.aspx

Asia-Pacific Telecommunity (APT)



- ▶ <http://www.aptsec.org/APTAPG>
- ▶ Chairman, APG:
Dr. Kyu-Jin Wee (Rep. of Korea),
kjwee56@rapa.or.kr; kjwee56@hotmail.com

Arab Spectrum Management Group (ASMG)



- ▶ Chairman, AMSG:
Mr. Tariq AL AWADHI, UAE,
tariq.alawadhi@tra.gov.ae

African Telecommunications Union (ATU)



- ▶ <http://www.atu-uat.org>

European Conference of Postal and Telecommunications Administrations (CEPT)



- ▶ <http://www.cept.org/ecc/groups/ecc/cpg>
- ▶ Chairman, CPG:
Mr. Alexandre Kholod, Switzerland,
alexandre.kholod@bakom.admin.ch

Inter-American Telecommunication Commission (CITEL)



CITEL

- ▶ <http://www.citel.oas.org/en/Pages/PCCII>
- ▶ Chairman of the PCC.II Working Group for the Preparation of CITEL for Regional and World Radiocommunication Conferences:
Mr. Victor Martinez, Mexico,
victor.martinezv@ift.org.mx

Regional Commonwealth in the Field of Communications (RCC)



- ▶ <http://www.en.rcc.org.ru>
- ▶ Chairman, RCC WG WRC-23/RA-23:
Mr. Albert Nalbandian, Armenia,
abo441@mail.ru



ITU-R Study Groups (incl. some ITU-R Resolutions)

- **Rev. Working Methods** - streamline & clarify procedures ([Res. ITU-R 1-8](#))
- **Unchanged basic Structure of Study Groups** (see [Res. ITU-R 4-8](#))
- **Updated Work Programme & Questions** (see [Res. ITU-R 5-8](#))
- **ITU-R collaboration with:**
 - ITU-T ([Res. ITU-R 6-3](#))
 - ITU-D ([Res. ITU-R 7-4](#))
 - **Other relevant organizations, incl. ISO, IEC & CISPR** ([Res. ITU-R 9-6](#))
- **Study Groups (SG) and sub-groups (e.g. Working Parties):**
 - List of **SG Chairmen and Vice-Chairmen** [online](#)
 - List of **sub-groups Chairmen and Vice-Chairmen** [online](#)
 - **Assignment of texts to the Sub-Groups on:**

Spectrum Management (SG 1, Doc. 1/1)	Radiowave Propagation (SG 3, Doc. 3/1)
Satellite Services (SG 4, Doc. 4/1)	Terrestrial Services (SG 5, Doc. 5/1)
Broadcasting Service (SG 6, Doc. 6/1)	Science Services (SG 7, Doc. 7/1)



38TH WORLD RADIOCOMMUNICATION CONFERENCE

ITU WRC
SHARM EL-SHEIKH 2019
28 October - 22 November
Sharm El-Sheikh, Egypt

Thank You

