07 April 2025, New Delhi

Qualcomm

WRC-27 Agenda Item 1.7

Dr. Punit Rathod

Sr. Lead Technical Standards

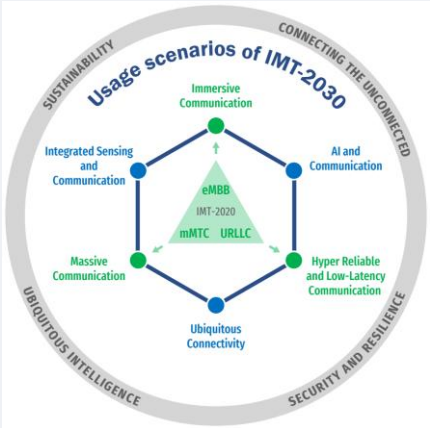
Spectrum Bands Identified for IMT studies

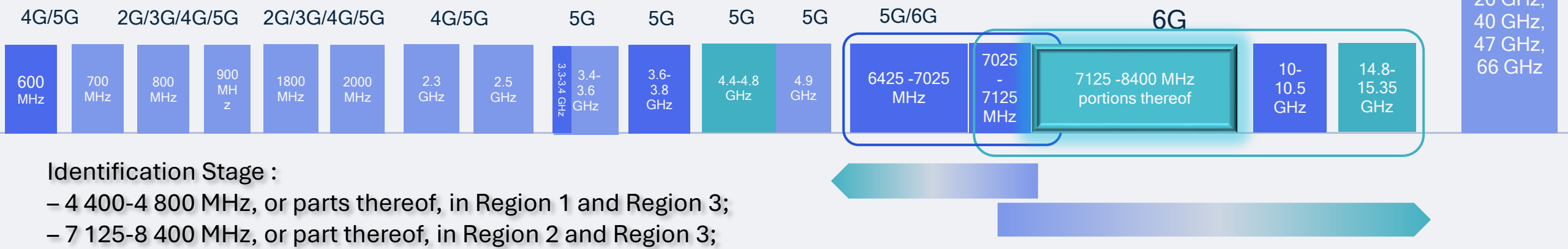
WRC-27 Agenda item 1.7

- Administrations or Regions will study new candidate bands for use by 6G/IMT-2030, for decisions WRC-27

Study Stage :
- 4 400-4 800 MHz
- 7 125-8 400 MHz
- 14.8-15.35 GHz.

Additional contiguous broadband spectrum in FR3 range is required to support the immersive communication and high-resolution sensing in wide area coverage deployment.

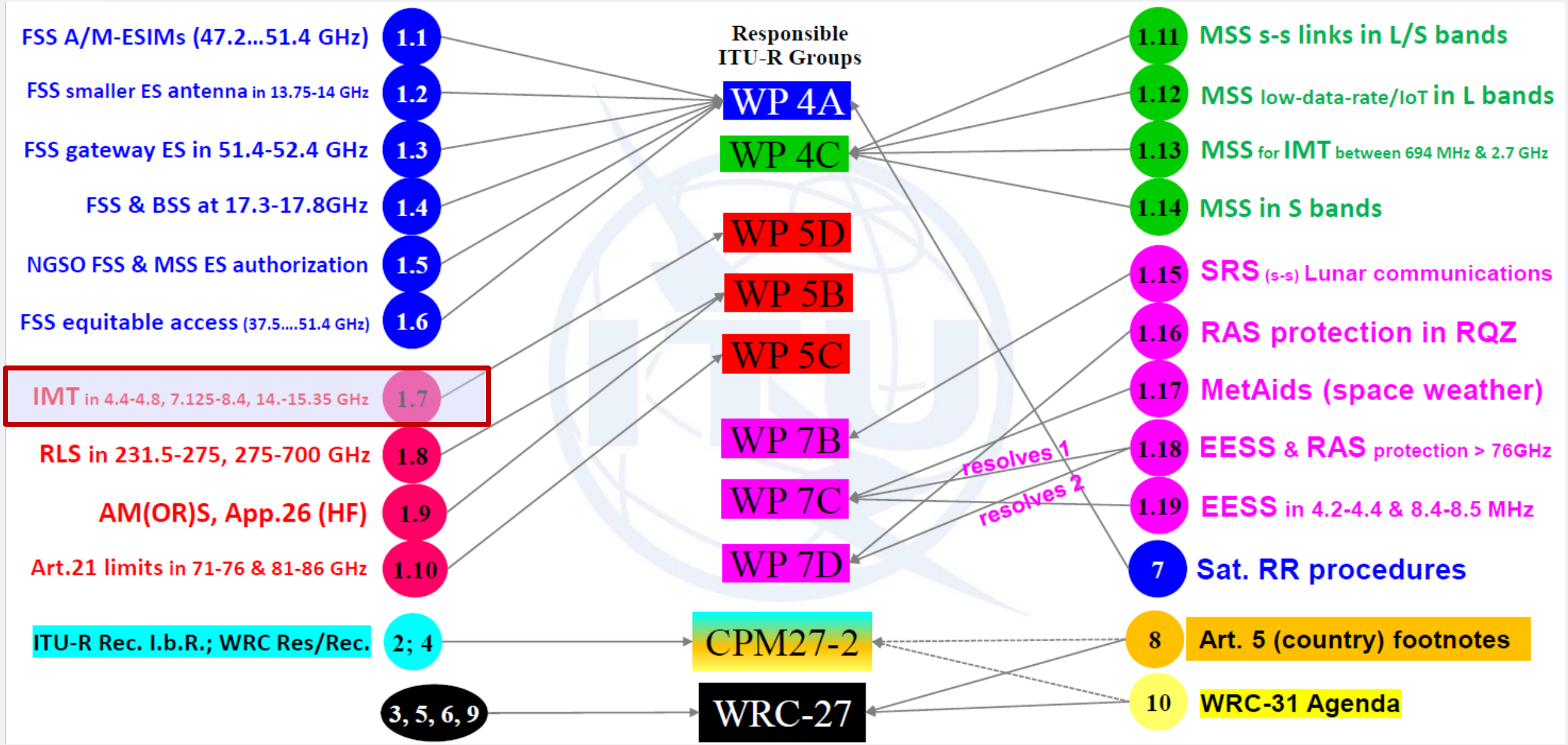




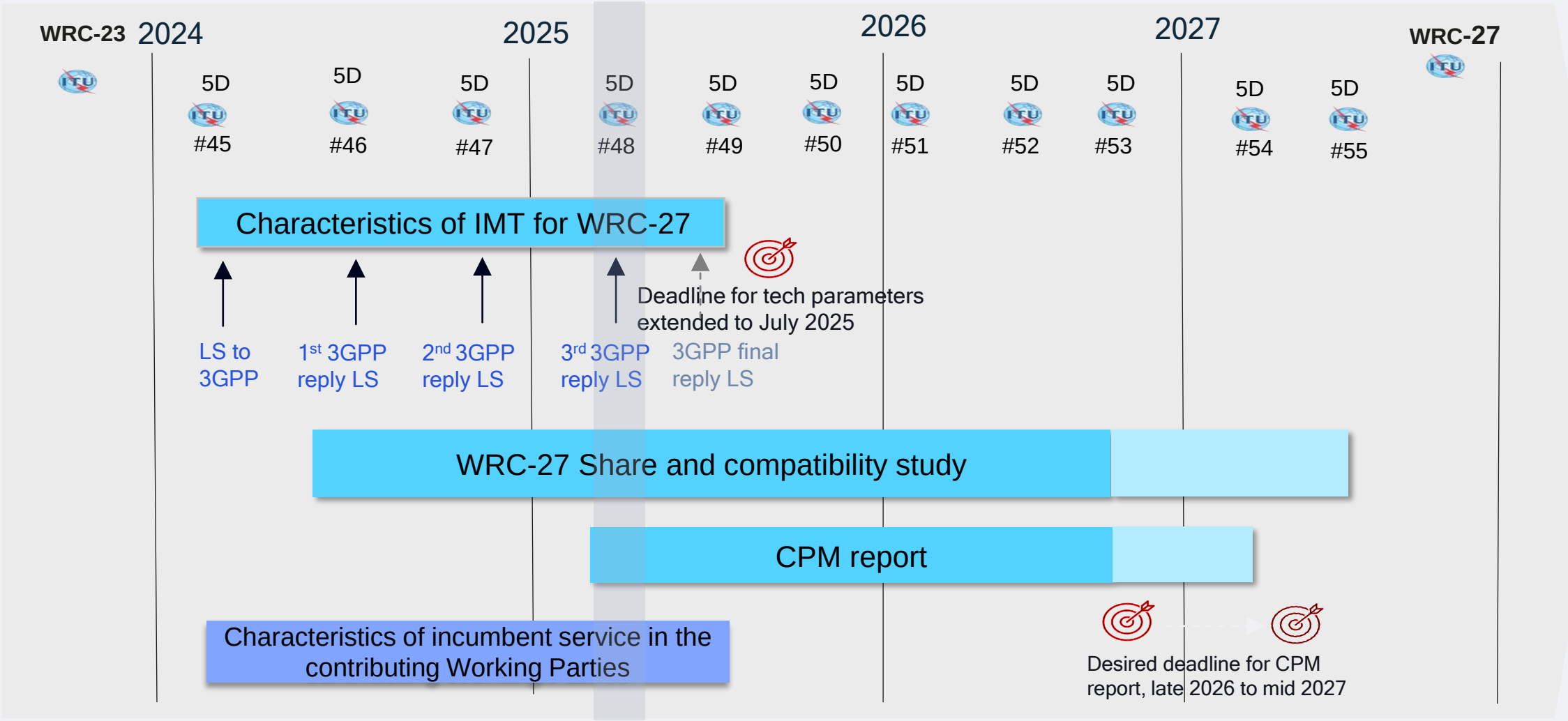
Identification Stage :
– 4 400-4 800 MHz, or parts thereof, in Region 1 and Region 3;
– 7 125-8 400 MHz, or part thereof, in Region 2 and Region 3;
– 7 125-7 250 MHz and 7 750-8 400, or part thereof, in Region 1;
– 14.8-15.35 GHz, Global

Existing IMT
IMT spectrum identified at WRC-23
IMT spectrum to be studied towards WRC-27

WRC-27 agenda items & Responsible Groups



ITU-R WP 5D WRC-27 AI1.7 Timeline



Incumbent Services Related to WRC-27 AI1.7 Frequency Ranges

Service	Frequency Ranges	Contributing WPs
4 400-4 800 MHz (contributing groups: WP 5C, WP4C, WP 5B, WP 1B, WP 7D)		
Fixed service	4 400-4 800 MHz	**WP 5C**
Fixed satellite service (space to Earth)	4500-4800 MHz	**WP 4A**
Aeronautical mobile service	4 400-4800 MHz	**WP 5B, WP 1B**
Radio astronomy	4 990–5 000 MHz (primary), 4 800-4 990 MHz(primary)	**WP 7D**
7 125-8 400 MHz (contributing groups: WP 5C, WP 4A, WP 4C, WP 5B, WP 7B, WP 7C, WP 7D, WP 1B)		
Fixed service	7 125-8 400 MHz	**WP 5C**
Fixed satellite service (space to Earth)	7 250-7750 MHz	**WP 4A**
Fixed satellite service (Earth to space)	7900-8400 MHz	**WP 4A**
Space operation service	7 100-7 155 MHz and 7 190-7 235 MHz	**WP 7B**
Space research(deep space) (Earth-to-space)	7 145-7 190 MHz	**WP 7B**
Earth exploration-satellite (Earth-to-space)	7 190-7 250 MHz	**WP 7B**
Earth exploration-satellite (space-to-Earth)	8 025-8400 MHz	**WP 7B**
Aeronautical mobile satellite (space-to-Earth)	7 375-7 750 MHz	**WP 4C**
Meteorological satellite (space-to-Earth)	7 450-7 550 MHz, 7 750-7 900 MHz	**WP 7B**
Meteorological satellite (Earth-to-space)	8 175-8 215 MHz	**WP 7B**
14.8-15.35 GHz (contributing groups: WP 5C, WP 4A, WP 7B, WP 7D)		
Fixed service	14.8-15.35 GHz	**WP 5C**
Fixed satellite service (space to Earth)	14.8-15.35 GHz	**WP 4A**
Space research service	14.8-15.35 GHz	**WP 7B**
Radio astronomy	15.35–15.4 GHz	**WP 7D**

WRC-27 agenda item 1.7
Progress so far

DG 4 GHz
Mr Masayoshi TACHIKI (J)

- 5 inputs
- All inputs carried forward to next meeting

DG 7/8 GHz
Dr Punit RATHOD (IND)

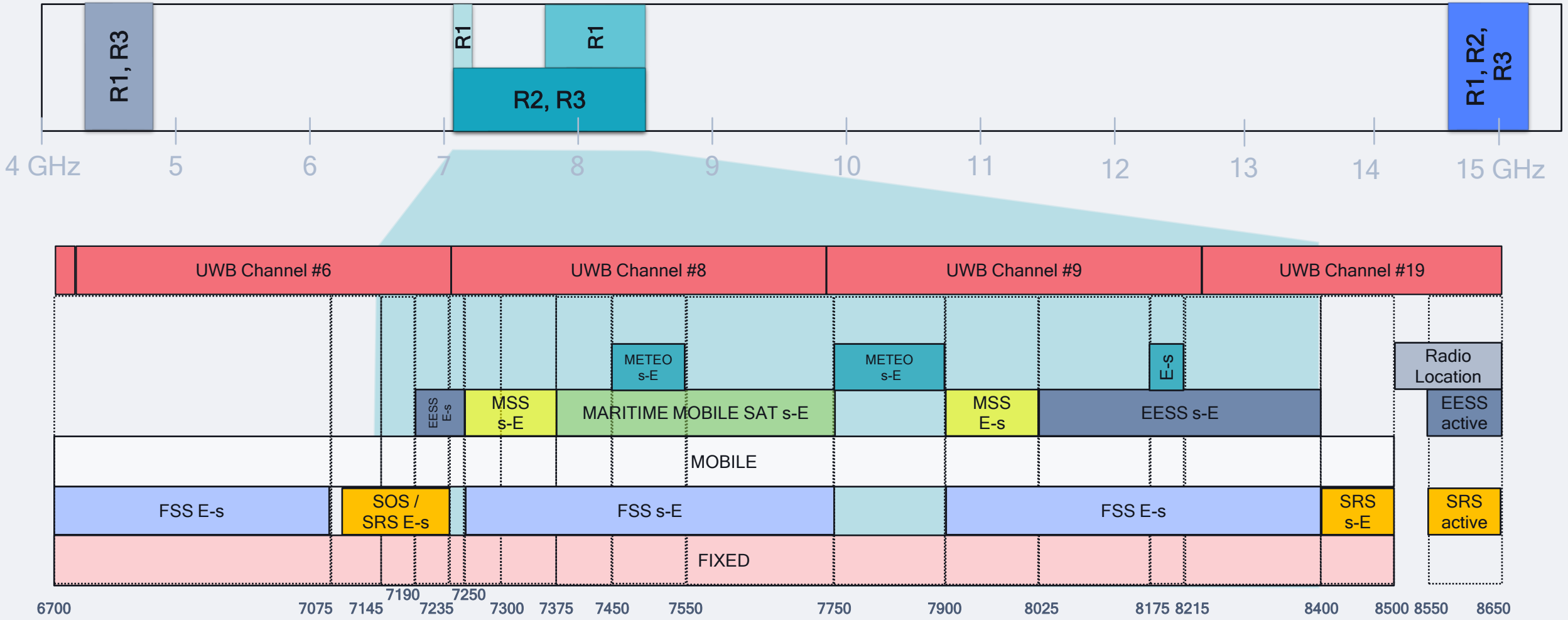
- 13 inputs
- All inputs carried forward to next meeting

DG 14/15 GHz
Mr Vladislav SOROKIN (RUS)

- 2 inputs
- Compilation document updated
- Only USA input with framework of sharing study

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)



Organization of WRC-27 Agenda Item 1.7

Document organization

Sharing and Compatibility Studies under WRC-27 Agenda Item 1.7 – Main Part

- Key-issue (Working document / Report)
- Common elements
- References to all incumbent LS

Annex 1: Sharing and compatibility studies of IMT systems in the frequency band 4 400-4 800 MHz (6 attachments)

Annex 2: Sharing and compatibility studies of IMT systems in the frequency band 7 125-8 400 MHz (11+[2] attachments)

Annex 3: Sharing and compatibility studies of IMT systems in the frequency band 14.8-15.35 GHz (4 attachments)

Sharing and Compatibility Studies

The sharing and compatibility studies are contained in the attachments to this document:

Attachment 1: Sharing between the fixed service and IMT operating in the frequency band 7 125-8 400 MHz

Attachment 2: Sharing between the [space research service (deep space) / space research service] (Earth-to-space) in the frequency band 7 145-[7 190 / 7 235] MHz and IMT operating in the frequency band 7 125-8 400 MHz

Attachment 3: Sharing between the space operation service (Earth-to-space) (see No. **5.459**) in the frequency bands 7 100-7 155 MHz and 7 190-7 250 MHz and IMT operating in the frequency band 7 125-8 400 MHz

Attachment 4: Sharing between the fixed satellite service (space-to-Earth) in the frequency band 7 250-7 750 MHz and IMT operating in the frequency band 7 125-8 400 MHz

Attachment 5: Sharing between the fixed satellite service (Earth-to-space) in the frequency band 7 900-8 400 MHz and IMT operating in the frequency band 7 125-8 400 MHz

Attachment 6: Sharing between the mobile satellite service (space-to-Earth) (see No. **5.461**) in the frequency band 7 250-7 375 MHz and IMT operating in the frequency band 7 125-8 400 MHz

Attachment 7: Sharing between the mobile satellite service (Earth-to-space) in the frequency band 7 900-8 025 MHz and IMT operating in the frequency band 7 125-8 400 MHz

Attachment 8: Sharing between the meteorological satellite service (space-to-Earth) in the frequency bands 7 450-7 550 MHz and 7 750-7 900 MHz and IMT operating in the frequency band 7 125-8 400 MHz

Attachment 9: Sharing between the meteorological satellite service (Earth-to-space) in the frequency band 8 175-8 215 MHz and IMT operating in the frequency band 7 125-8 400 MHz

Attachment 10: Sharing between the Earth exploration satellite service (space-to-Earth) in the frequency band 8 025-8 400 MHz and IMT operating in the frequency band 7 125-8 400 MHz

Attachment 11: Compatibility of the space research service (space-to-Earth) operating in the frequency band 8 400-8 500 MHz and IMT operating in the frequency band 8 215-8 400 MHz

Inputs to WP 5D#48 on WRC-27 Agenda Item 1.7

[Drafting Group]

Topic	Range (MHz)	Documents	Comment
LS		5D/418 (WP4C)	
FS	7 125-8 400	5D/497 (USA), 5D/523 (J)	Attachment 1
SRS (E-to-s)	7 145-[7 190 / 7 235]	5D/502 (USA), 5D/532 (GSMA), 5D/513 (ESA), 5D/449 (KOR)*	Attachment 2
SOS (E-to-s)	7 100-7 155 and 7 190-7 250		Attachment 3
FSS (s-to-E)	7 250-7 750	5D/474 (CHN), 5D/498 (USA)	Attachment 4
FSS (E-to-s)	7 900-8 400	5D/503 (USA), 5D/548 (F, LUX)	Attachment 5
MSS (s-to-E)	7 250-7 375		Attachment 6
MSS (E-to-s)	7 900-8 025	5D/503 (USA), 5D/548 (F, LUX)	Attachment 7
MetSat (s-to-E)	7 450-7 550 and 7 750-7 900	5D/475 (CHN), 5D/494 (USA)	Attachment 8
MetSat (E-to-s)	8 175-8 215		Attachment 9
EESS (s-to-E)	8 025-8 400	5D/494 (USA), 5D/500 (USA), 5D/514 (ESA), 5D/539 (D, F)	Attachment 10
SRS (s-to-E)	8 400-8 500	5D/501 (USA)	Attachment 11
General		5D/74 (BR), 5D/196 (F), 5D/439 (IND)*, 5D/449 (KOR)*, 5D/534 (BHR et. al)*, 5D/551 (UAE)	

Space Related Incumbent Services Analysis

SG 4 Groups

WP 4A: FSS protection criteria and NGSO inclusion (parameters and modeling)

- Challenge: Protection criteria under consideration is more stringent as compared to general FSS. Strange and inconsistent NGSO parameters and deployment scenarios.

WP 4C: MSS parameters and protection criteria

- Challenge: No MSS protection criteria in ITU-R report and recommendations. None of NGSO filed MSS satellite systems in 7/8 GHz have been brought into use

SG 7 Groups

WP 7B SRS, EESS, MetSat, SOS: SRS transfer operation

- Challenges: 5D has sent a reply LS to 7B to ask for more clarification, especially on link budget (target C/(I+N)) for interference exceedance of existing protection criteria.

WP 7B, WP 4A, WP 4C: Reverse study from the existing incumbent services to IMT

- Challenges: High Tx power of SRS in 7.145-7.235 GHz may require large separation distance with IMT. Only countable number (single digits) in entire world

WP 7C: Linkage to WRC-27 AI1.15 (lunar communication) and AI1.19 (EESS Sea Surface Temperature)

WRC-27 Agenda Item 1.7 - Reverse Studies

Mainly dominated by 7-8 GHz (interference from existing services into IMT)

- Key issue:

  …with a view to ensuring the protection of services to which the frequency band is allocated on a primary basis, … without imposing additional regulatory or technical constraints on those services…

- Common understanding (5D/563 Annex 4.13)
  - Such studies are not explicitly included in Resolution 256 (WRC-23), nor are they excluded.
  - Such studies are not expected to be carried out for every sharing and compatibility scenario between IMT and existing services
  - Methods and regulatory examples under WRC-27 agenda item 1.7 (Sections 4 and 5 of the draft CPM text) are not expected to include proposed changes to existing provisions of the Radio Regulations for concerned existing services. No change to existing service technical / regulatory conditions
  - May be done on case-by-case basis (e.g., MSS, SRS) based on input contributions.

Thank you

Follow us on:

For more information, visit us at qualcomm.com & qualcomm.com/blog