WRC-19 PREPARATION

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International Telecommunication Union

ITSO/ITU Workhop on Satellite Communications

AFRALTI, Nairobi, 17-21 July 2017

Purpose of ITU WRCs

➢ **Create regulatory certainty for a multi-trillion dollars industry which plays a increasingly important role in the development of our societies**

➢ **For fixed, mobile, satellites and broadcasting industries, global spectrum harmonization is essential to create economies of scale, roaming and interoperability**

➢ **Creating certainty requires consensus in order to achieve stable results.**
This demands time, efforts and patience.

The WRC Purposes

✓**Updates the Radio Regulations (CS* 89)**
(treaty status)

Radio Regulations

- **Spectrum Allocation**
- **Coordination and Notification procedures**
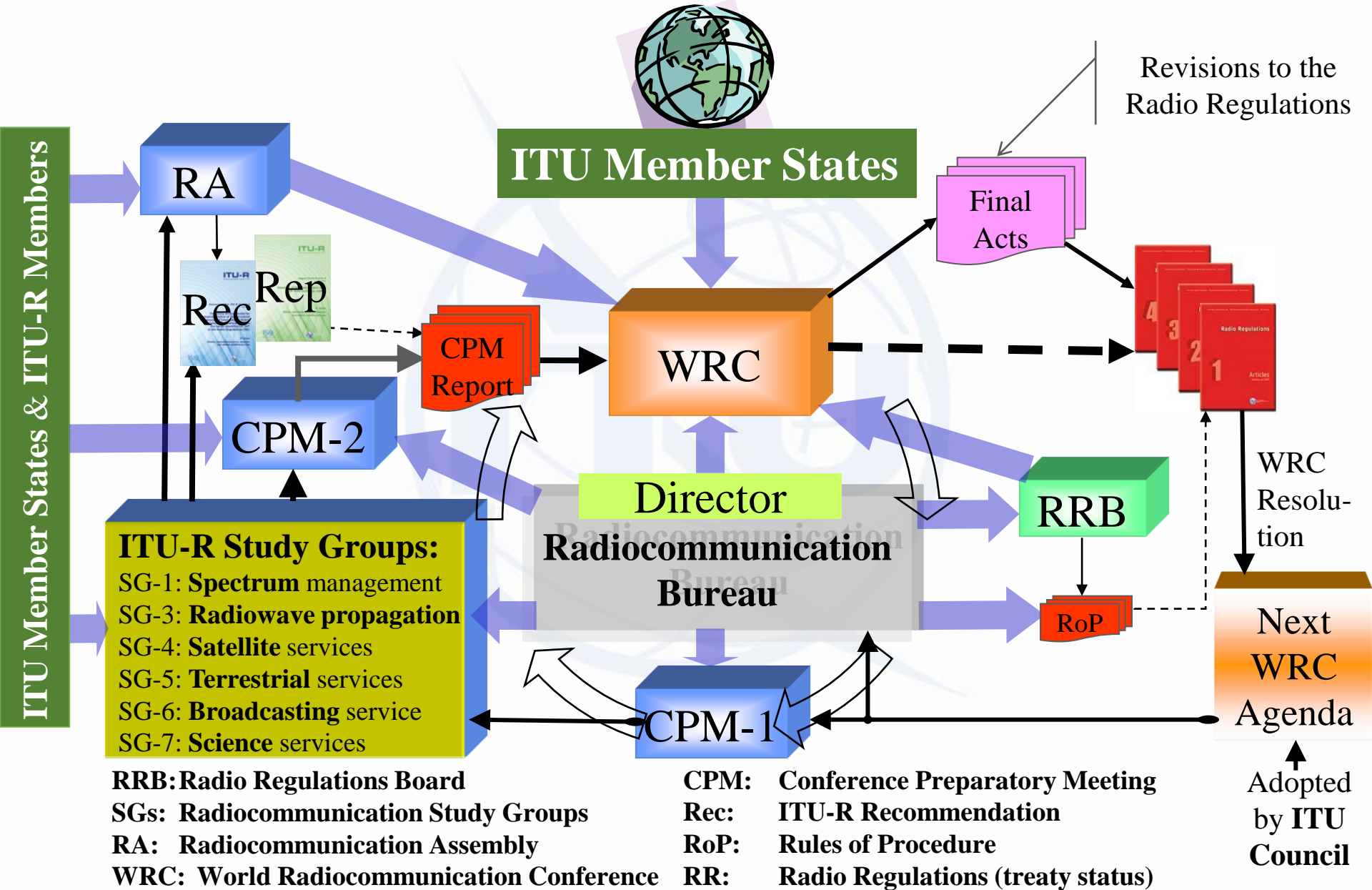- **Administrative and operational procedures**

✓**Adopts Resolutions**

✓**Held every 3-4 years (CS* 90)**

✓**Additional provisions in CV* and GR***

* Constitution (CS), Convention (CV) and General Rules (GR) of Conferences, Assemblies and Meetings of the ITU are available in ITU Collection of Basic Texts (www.itu.int/pub/S-CONF-PLEN)

The WRC Cycle

ITU Member States & ITU-R Members

RA

Rec   Rep

CPM-2

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

CPM Report

ITU Member States

Director
Radiocommunication Bureau

WRC

Final Acts

Revisions to the Radio Regulations

RRB

RoP

WRC Resolu-tion

Next WRC Agenda

CPM-1

Adopted by **ITU Council**

RRB:	**Radio Regulations Board**	
SGs:	**Radiocommunication Study Groups**	
RA:	**Radiocommunication Assembly**	
WRC:	**World Radiocommunication Conference**	

CPM:	**Conference Preparatory Meeting**
Rec:	**ITU-R Recommendation**
RoP:	**Rules of Procedure**
RR:	**Radio Regulations (treaty status)**

Overview of the preparations

(WRC-15 Docs)

APT ([Doc. 32](#))

ASMG ([Doc. 25](#), also [43](#), [144](#), [189](#))

ATU ([Doc. 28](#))

CEPT ([Doc. 9](#))

CITEL ([Doc. 7](#))

RCC ([Doc. 8](#), also [146](#), [270](#))

Regional preparation
Resolution 72 (Rev.WRC-07)

Agenda: draft in WRC Res & final in Council Res

Informal Group
(Structure & Chairmanship)
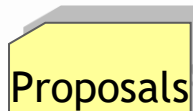
Proposals

Coordinated common proposals

Proposals
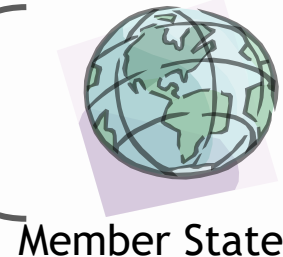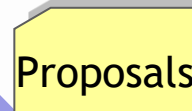
Member States

RA
RA Report
([Doc. 216](#))
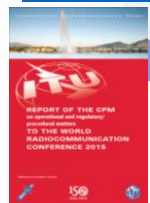
CPM Report
([Doc. 3](#))

Director's Report
([Doc. 4](#) & [Doc. 5](#))

WRC

Conference Secretariat
(BR & GS)

[Final Acts](#)

Radio Regulations
(CS89)

Some statistics on WRC-15

Took place from 2 to 27 November 2015 in Geneva

- **3275 Participants**
  (**2780** from MS & **495** from OE)
- **162 Member States**
- **130 Observers**

- **678 Documents**
  submitted with MS proposals
- **2888 MS Proposals**
  ~2/3 **of common proposals**

WRC-15 Plenary
45h10m / 25 sessions

| COMs 4, 5, 6 level:	W G level:	SW G level:	A H G level:
53h40m / 37 sessions	113h45m / 79 sessions	350h15m / 246 sessions	128h50m / 113 sessions

Some WRC-15 key achievements

- **Providing spectrum for mobile broadband (IMT) on a global basis**
- **Providing frequencies for Global Flight Tracking**
- **Making new allocations to the FSS, MMSS and EEESS**
- **Authorizing frequency bands and establishing regulatory conditions for unmanned aircraft systems**
- **Providing required spectrum for WAIC as well as for automotive and maritime transports**
- **Improving the satellite frequency assignments regulatory procedures**

These results have demonstrated once again the **ITU ability** to **keep up with the pace of technological advancements** and to **timely respond to the urgent needs of the Membership**

WRC-15 outcome & follow-up
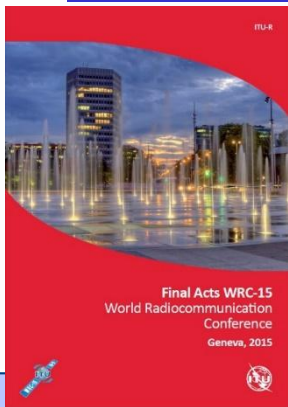
WRC-15 Final Acts available at:
www.itu.int/pub/R-ACT-WRC.12-2015
(ITU CL-16/22 of 17 May 2016)

See relevant BR Circular Letters at:
www.itu.int/md/R00-CR-CIR/en

Circulars

Number	Received	Source	Title
...			
[407]	2016-07-05	Director, BR	Implementation of decisions of the World Radiocommunication Conference, Geneva 2015 (WRC-15), related to earth stations on board unmanned aircraft (Resolution 155 (WRC-15))
[406]	2016-06-21	Director, BR	Implementation of decisions of the World Radiocommunication Conference, Geneva 2015 (WRC-15) and associated transitional arrangements related to terrestrial services
[405]	2016-05-24	Director, BR	Equivalent power flux density (EPFD) validation software (Resolution 85 (WRC-03))
[404]	2016-05-23	Director, BR	Submission of typical earth stations in the fixed-satellite service
[403]	2016-06-21	Director, BR	Implementation of decisions of the World Radiocommunication Conference, Geneva, 2015 (WRC-15) and associated transitional arrangements related to space services
[402]	2016-05-26	Director, BR	Rules of Procedure approved by the Radio Regulations Board
[401]	2016-05-02	Director, BR	Transitional measures for the elimination of advance publication filings by administrations for frequency assignments to satellite networks and systems subject to Section II of Article 9
[400]	2016-04-29	Director, BR	Implementation of revised Appendices 30 and 30A (Rev. WRC-15) and Resolution 556 (WRC-15)
...			
[389]	...		WRC-15 decisions included in the Minutes of Plenary meetings

Radio Regulations (2016 Ed.)

Radio Regulations

The Radio Regulations contains the complete texts as adopted by the World Radiocommunication Conference (Geneva, 1995) (WRC-95) and subsequently revised and adopted by World Radiocommunication Conferences, including all Appendices, Resolutions, Recommendations and ITU-R Recommendations incorporated by reference.

Related links

- World Radiocommunication Conferences

2016 *New!* Publication Notice with Order Form

The Radio Regulations, edition of 2016, contains the complete texts of the Radio Regulations as adopted by the World Radiocommunication Conference (Geneva, 1995) (WRC-95), subsequently revised and approved by the World Radiocommunication Conference (Geneva, 1997) (WRC-97), the World Radiocommunication Conference (Istanbul, 2000) (WRC-2000), the World Radiocommunication Conference (Geneva, 2003) (WRC-03), the World Radiocommunication Conference (Geneva, 2007) (WRC-07), the World Radiocommunication Conference (Geneva, 2012) (WRC-12) and the World Radiocommunication Conference (Geneva, 2015) (WRC-15), including all Appendices, Resolutions, Recommendations and ITU-R Recommendations incorporated by reference. Available: end-October 2016

Available in

Other editions: 2012   Edition of 2008   Edition of 2004   Edition of 2001   Edition of 1998

Main Steps towards WRC-19

WRC-15: **WRC-19 Agenda** - **Resolution 809** (WRC-15)

1st Session of Conference Preparatory Meeting: **CPM19-1**
30 Nov – 1 Dec. 2015; **Results @CA/226 of 23/12/2015**

Council-16: WRC-19 agenda in **Res. 1380** with dates & venue
Approved/Confirmed in **Geneva** after Member States consultation (CV Nos. 42 & 118) (CL-16+/57)

2nd Session of Conference Preparatory Meeting: **CPM19-2**
Planned dates at CICG in Geneva from 18 to 28 February 2019

Final meetings of regional groups
Member States' proposals to WRC-19

RA-19: **21 to 25 Oct. 2019** ; WRC-19: **28 Oct. to 22 Nov. 2019**

CPM-19

Chairman

Mr K. AL-AWADHI (UAE), E-mail: khalid.alawadi@tra.gov.ae

Vice-Chairmen, CPM

Mr M. AL BADI (OMA),   E-mail: albadi@tra.gov.om

Ms C. BEAUMIER (CAN),   E-mail: Chantal.Beaumier@ic.gc.ca

Mr X. GAO (CHN),   E-mail: gaoxiaoyang@chinasatcom.com

Mr V. GOEL (IND),   E-mail: viresh.goel@gmail.com

Mr A. KÜHN (D),   E-mail: alexander.kuehn@bnetza.de

Dr H. SEONG (KOR),   E-mail: seong@msip.go.kr

Mr T. SHAFIEE (IRN),   E-mail: shafiee@cra.ir

Mr. A. V. VASSILIEV (RUS), E-mail: alexandre.vassiliev@ties.itu.int

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

First Session of CPM-19

Scope defined in **Resolution ITU-R 2-7**

✓ **Geneva, 30 November - 1 December 2015**
(269 participants, 63 MS, 25 SM, 13 contributions)
⇒ **results published in CA/226, of 23 Dec. 2015**
(see at http://www.itu.int/md/R00-CA-CIR-0226/en)

➢ **Define framework of preparatory studies with Structure of the draft CPM Report (see the proposed detailed structure at: http://www.itu.int/oth/R0A0A00000A/en) and six Chapter Rapporteurs**

➢ **Identify responsible ITU-R Groups**
    for each WRC-19 agenda item (AI) and issue
    ⇒ **9 existing Working Parties and**
    ⇒ **Proposed new TG 5/1 for AI 1.13 (ToR in Annex 9 of CA/226)**
    + 3 existing WPs for the WRC-23 preliminary agenda items and concerned (contributing / interested) ITU-R groups (see Annexes 7 and 8 to CA/226)

Overlapping frequency bands (GHz) between some WRC-19 agenda items

AI1.6 – NGSO FSS Res. 159 (WRC-15)	AI1.13 – IMT Res. 238 (WRC-15)	AI1.14 – HAPS Res. 160 (WRC-15)	AI9.1 (9.1.9) – FSS Res. 162 (WRC-15)
	24.25-27.5	24.25-27.5 (Reg. 2)	
37.5-39.5 (s-E*)	37-40.5	38-39.5 (globally)	
39.5-42.5 (s-E*)	40.5-42.5		
47.2-50.2 (E-s*)	47.2-50.2		
50.4-51.4 (E-s*)	50.4-52.6		51.4-52.4 (E-s*)
* E-s: Earth-to-space; s-E: space-to-Earth.			

Studies to **address mutual compatibility & sharing feasibility** among the **services/applications** for which **allocation/identification is envisaged** under the corresponding Res. relating to the AI in the overlapping bands

Draft CPM Report – ToC

(see Annex 6 to CA/226)

Chapters of the draft CPM Report	**WRC-19 Agenda items**
1. Land mobile and fixed services	**1.11, 1.12, 1.14, 1.15**
2. Broadband applications in the mobile service	**1.13, 1.16, 9.1 (9.1.1, 9.1.5, 9.1.8)**
3. Satellite services	**1.4, 1.5, 1.6, 7, 9.1 (9.1.2, 9.1.3, 9.1.9)**
4. Science services	**1.2, 1.3, 1.7**
5. Maritime, aeronautical and amateur services	**1.1, 1.8, 1.9.1, 1.9.2, 1.10, 9.1 (9.1.4)**
6. General issues	**2, 4, 9.1 (9.1.6, 9.1.7), 10**

CPM Chapter Rapporteurs

Chapters	Rapporteurs
1. Land mobile and fixed services	**Ms K. ZHU (CHN)**, Email: Zhukeer@miit.gov.cn
2. Broadband applications in the mobile service	**Mr J. ARIAS FRANCO (MEX)**, Email: jose.arias@ift.org.mx
3. Satellite services	**Mr N. VARLAMOV (RUS)**, Email: vnv73@mail.ru
4. Science services	**Mr V. MEENS (F)**, Email: vincent.meens@cnes.fr
5. Maritime, aeronautical and amateur services	**Mr W. EL SAYED (EGY)**, Email: wsayed@ntra.gov.eg
6. General issues	**Mr P.N. NGIGE (KEN)**, Email: ngige@cck.go.ke

(see details at www.itu.int/en/ITU-R/study-groups/rcpm/Pages/cpm-19-chp-rapporteurs.aspx)

WRC-19 agenda items & Resp. Groups

Responsible ITU-R Groups

Agenda Item	Description
1.1	Amateur @ 50-54 MHz
1.2	MSS/MetSat/EESS ES @ 400MHz
1.3	MetSat/EESS @ 460-470MHz
1.4	BSS Plans/Lists & FSS App. 30 Annex 7 limitations
1.5	FSS ESIM
1.6	N-GSO QV-FSS
1.7	TT&C for NGSO of Short duration
1.8 ***	GMDSS, incl. Sat.
1.9.1	Maritime radio devises
1.9.2	VDES Sat. comp.
1.10	GADSS
2, 4, 10	
8	Art. 5 (country) footnotes

Responsible ITU-R Groups:

- WP 5A
- WP 7B
- WP 4A
- WP 5B
- TG 5/1 ** — ** see slide 17
- WP 5C
- WP 1A
- WP 4C ***
- WP 5D
- WP 1B
- CPM19-2
- WRC-19

*** WP 4C is in charge of developing studies and draft CPM text on *resolves to invite ITU-R* 2 of Res. 359 (Rev.WRC-15) (AI 1.8) and sending that to WP 5B

Agenda Item	Description
1.11	Railway in MS
1.12	ITS in MS
1.13	24.25 GHz < IMT < 86 GHz
1.14	HAPS
1.15	Sat. RR procedures
1.16	MS/FS Apps Id. @ 275-450 GHz
7*	
9.1.5	
9.1.1*	
9.1.2*	* Relevant part
9.1.3	9.1.9
9.1.4	
9.1.8	
9.1.6	9.1.7

WAS/RLAN

9.1 Issues BR Dir.'s Report (9)

3, 5, 6, 9

5 preliminary agenda items, Res. 810 (WRC-15)

Responsible ITU-R Groups

2.1 Res. 361 – Spectrum for GMDSS modernization & (WRC-15) implementation of e-navigation → WP 5B

2.2 Res. 656 – Possible new allocations for EESS (active) (WRC-15) for spaceborne radar sounders @ 45 MHz

WP 7C

2.3 Res. 657 – Spectrum needs & designation of radio (WRC-15) services for space weather sensors

2.4 Res. 161 – Possible new allocations for (WRC-15) FSS @ 37.5-39.5 GHz → WP 4A

2.5 Res. 235 – Spectrum use and needs of existing services (WRC-15) @ 470-960 MHz in Region 1 and possible regulatory actions @ 470-694 MHz in Region 1

Task Group 5/1 on WRC-19 AI 1.13

Taking into account CPM19-1 Decision (CA/226 Annex 9), SG 5 established new TG 5/1 (www.itu.int/en/ITU-R/study-groups/rsg5/tg5-1)

➢ **Conduct sharing and compatibility studies**

➢ **Develop draft CPM text under WRC-19 agenda item 1.13 to be submitted directly to the CPM-19 Process**

➢ **Considering results from**
- WP 5D* on studies on spectrum needs, technical and operational characteristics of IMT by **31 March 2017**
- Technical characteristics including protection criteria provided by involved Working Parties* by **31 March 2017** for existing services allocated in, or adjacent to bands
- SG 3 WPs* on propagation models by **31 March 2017**;

➢ **TG 5/1 will work making maximum use of modern means of communications, incl. remote participation to the extent practicable**

➢ **TG 5/1 management team including AI 1.13 coordinators from the six regional groups (APG, ASMG, ATU, CEPT, CITEL, RCC)**

* Involved Working Parties contributing to this issue: 3J, 3K, 3M, 4A, 4B, 4C, 5A, 5B, 5C, 5D, 6A, 7B, 7C, 7D
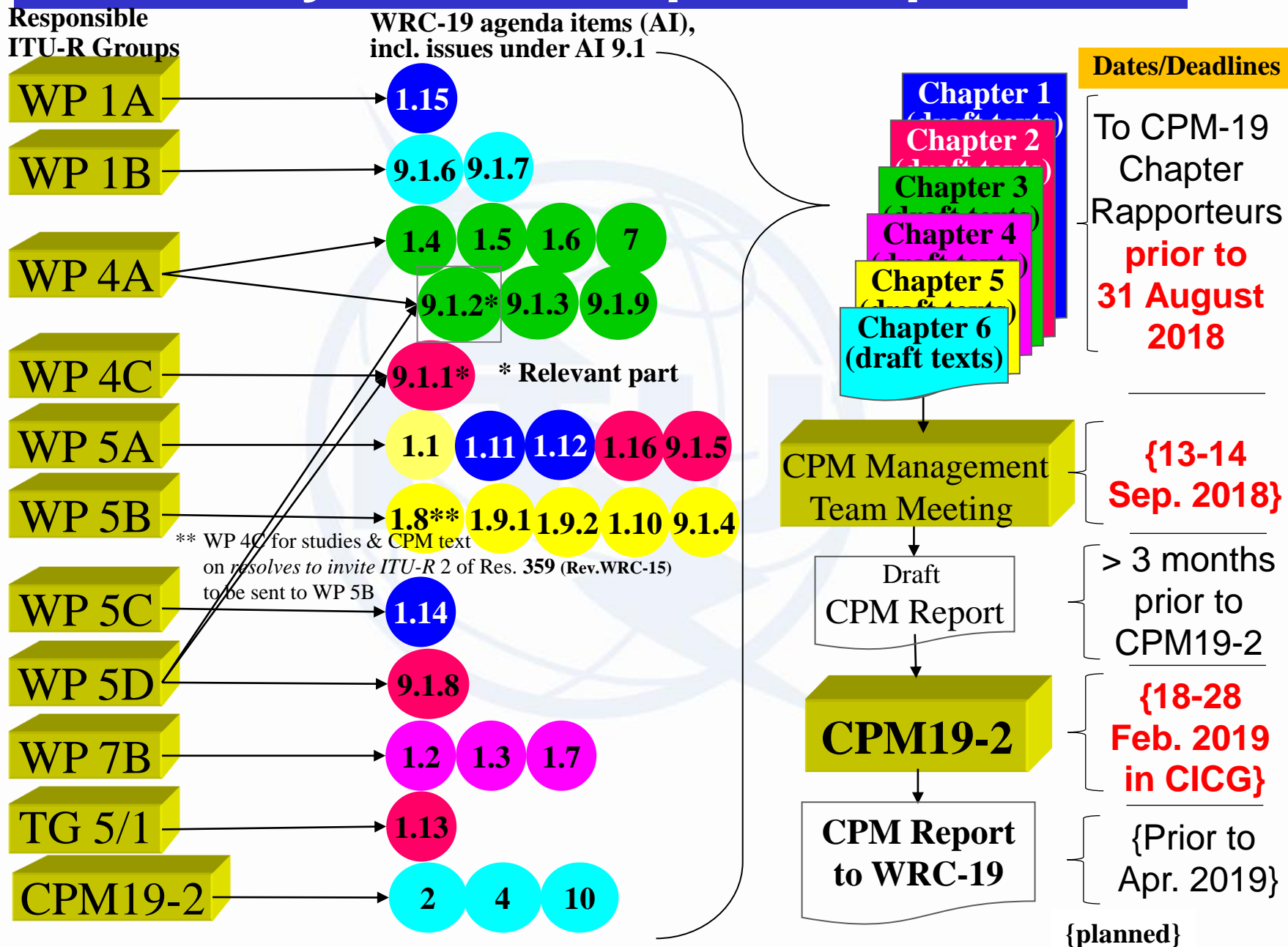
Responsible ITU-R Groups activities

⇒ **Examine contributions from the membership**
(Member States, Sector members, Associates, Academia)

⇒ **Ensure necessary coordination with the concerned groups (contributing/interested working parties)**

⇒ **Carry out technical studies (incl. compatibility & sharing) & develop necessary draft ITU-R Rec. & Reports for consideration by the relevant ITU-R Study Group(s)**

⇒ **Develop draft CPM texts**, including:
  ➢ Background; Summary & Analysis of study results
  ➢ Proposed **method(s)** to **satisfy** the **agenda items**
  ➢ **with** associated examples of **regulatory texts**
  to be **sent to CPM Chp. Rap.** on time for **CPM19-2**

⇒ **Finalize the technical studies prior to RA-19**

Summary of CPM Report Preparation

Responsible ITU-R Groups

WRC-19 agenda items (AI), incl. issues under AI 9.1

Group	Agenda items
WP 1A	1.15
WP 1B	9.1.6 9.1.7
WP 4A	1.4 1.5 1.6 7 9.1.2* 9.1.3 9.1.9
WP 4C	9.1.1*
WP 5A	1.1 1.11 1.12 1.16 9.1.5
WP 5B	1.8** 1.9.1 1.9.2 1.10 9.1.4
WP 5C	1.14
WP 5D	9.1.8
WP 7B	1.2 1.3 1.7
TG 5/1	1.13
CPM19-2	2 4 10

* Relevant part

** WP 4C for studies & CPM text on *resolves to invite ITU-R* 2 of Res. **359** (Rev.WRC-15) to be sent to WP 5B

Chapter 1 (draft texts)
Chapter 2 (draft texts)
Chapter 3 (draft texts)
Chapter 4 (draft texts)
Chapter 5 (draft texts)
Chapter 6 (draft texts)

To CPM-19 Chapter Rapporteurs **prior to 31 August 2018**

CPM Management Team Meeting — **{13-14 Sep. 2018}**

Draft CPM Report — > 3 months prior to CPM19-2

CPM19-2 — **{18-28 Feb. 2019 in CICG}**

CPM Report to WRC-19 — {Prior to Apr. 2019}

{planned}

CPM-19 Management Team

Organised in accordance with [Res. ITU-R 2-7](#) and composed of:
- **CPM-19 Chairman, Vice-Chairmen and Chapter Rapporteurs**
- **Chairmen of Study Groups and Responsible Groups**

⇒ **Consolidate the draft CPM texts/chapters into the draft CPM Report to WRC-19 (input to CPM19-2)**

See also **[CA/226 Add.1](#)** on **Preparation** of the **Draft CPM Report** to **WRC-19**

Second Session of CPM-19

➢ **Based on the draft CPM Report (available in six official ITU languages a minimum of 3 months before CPM19-2)**

➢ **Consider contributions from ITU Member States & ITU-R Sector Members**

➢ **Consider also a preliminary draft version of the BR Director's Report to WRC-19**

⇒ **To finalize the CPM Report to WRC-19 (incl. draft solutions (methods) to satisfy the agenda items**

Overview of the ITU-R Calendar towards WRC-19

Year	January – March	April – June	July – September	October – December
2015	CPM15-2	Last meetings of the Responsible Groups	WS on WRC-15	RA-15 / WRC-15 / **CPM19-1**
2016	WP 5D (1st)	WPs 7B & 7C (1st) / WP 4C+WP 4A (1st) / WPs 5A, 5B & 5C (1st) / TG 5/1 (1st) / WPs 1A & 1B (1st) / WP 5D (2nd)	WP 4C+WP 4A (2nd) / CPM-19 Steering	WP 5D (3rd) / WPs 7B & 7C (2nd) / WPs 5A, 5B & 5C (2nd) / WPs 1A & 1B (2nd)
2017	WP 5D (4th)	WPs 7B & 7C (3rd) / WP 4C+WP 4A (3rd) / TG 5/1 (2nd) / WPs 5A, 5B & 5C (3rd) / WPs 1A & 1B (3rd) / [WP 5D (5th)]	[TG 5/1 (3rd)]	[WP 5D (6th)] / [WP 4C+WP 4A (4th)] / [WPs 7B & 7C (4th)] / [WPs 5A, 5B & 5C (4th)] / [WS on WRC-19] / [WPs 1A & 1B (4th)]
2018	[Responsible Groups Meetings] / [TG 5/1 (4th)]	[Responsible Groups Meetings] / [TG 5/1 (5th)]	[TG 5/1 (6th)] / [Responsible Groups Meetings] / CPM-19 Managnt Team	[Responsible Groups Meetings] / [WS on WRC-19]
2019	CPM19-2	[Last meetings of the Responsible Groups]	[WS on WRC-19]	RA-19 / WRC-19

[…] = planned meetings

WS on WRC-19 = ITU Inter-regional Workshop on WRC-19 Preparation

Up-to-date information on ITU-R meetings at: www.itu.int/en/events/Pages/Calendar-Events.aspx?sector=ITU-R

Information on CPM19-2 Preparation (e.g. dates, deadlines) at: www.itu.int/md/R00-CA-CIR-0226

Next Meetings of Resp. Groups

Responsible ITU-R Groups

WRC-19 agenda items (AI), incl. issues under AI 9.1

Meeting dates

WP 7B → 1.2 1.3 1.7 → **5 – 11 Apr. 17**

WP 7C, responsible for WRC-23 preliminary agenda items 2.2 and 2.3, meets usually in parallel with WP 7B

WP 4C** → 9.1.1* → **26 Apr. – 2 May 17**

* Relevant part

WP 4A → 1.4 1.5 1.6 7
9.1.2* 9.1.3 9.1.9 → **3 – 12 May 17**

TG 5/1 → 1.13 → **15-23 May 2017**

WP 5A → 1.1 1.11 1.12 1.16 9.1.5 → **22 May – 1 June 17**

WP 5B → 1.8** 1.9.1 1.9.2 1.10 9.1.4 → **22 May – 2 June 17**

** WP 4C is in charge of developing studies and draft CPM text on *resolves to invite ITU-R* 2 of Res. 359 (Rev.WRC-15) (AI 1.8) and sending that to WP 5B

WP 5C → 1.14 → **22 – 31 May 17**

WP 1A → 1.15 → **13 – 20 June 17** (RG-WPT on 12 June 17)

WP 1B → 9.1.6 9.1.7

WP 5D → 9.1.8 → **13 – 21 June 17**

Up-to-date information online at: http://www.itu.int/en/events/Pages/Calendar-Events.aspx?sector=ITU-R

WRC Regional Preparation
Pursuant to Resolution 72 (Rev. WRC-07)

See details @ www.itu.int/go/wrc-19-regional

Regional preparation for WRC-19

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)

› Resolution 72 (Rev. WRC-07)

Asia-Pacific Telecommunity (APT)	Arab Spectrum Management Group (ASMG)
2nd APG-19: 17-21 July 2017, Bali, Indonesia	22nd ASMG: [2017]
African Telecommunications Union (ATU)	European Conference of Postal and Telecommunications Administrations (CEPT)
2nd APM-19: 7-11 August 2017, Dakar, Senegal	4th CPG-19: 4-7 July 2017
Inter-American Telecommunication Commission (CITEL)	Regional Commonwealth in the Field of Communications (RCC)
XXIX PCC.II: 27 - 30 June 2017, Orlando, USA	3rd RCC WG WRC-19/RA-19: 10-13 April 2017, Bishkek, Kyrgyz Republic

ITU Inter-Regional Workshops on WRC-19 Preparation

1st Workshop [21-22]* Nov. 2017

- **To be scheduled halfway through the preparatory cycle**
- ⇨ **Presentation and review of the on-going preparatory studies of the ITU-R responsible groups for CPM-19**
- ⇨ **Presentation of the organization, preliminary views, draft priorities and positions of the regional groups**

* Subject to the confirmation of the dates of the ITU-R SG 5 meeting currently planned on 20 Nov. 2017 **

2nd Workshop [Q4 2018]**

- **To be scheduled few months prior to CPM19-2**
- ⇨ **Presentation of the Draft CPM Report to WRC-19 (explanation of the draft Methods to satisfy the WRC-19 agenda items)**
- ⇨ **Presentation and review of the regional groups' draft views, positions and common proposals**

3rd Workshop [Q3 2019]**

- **To be scheduled few months prior to WRC-19**
- ⇨ **Presentation of the CPM & Dir. Reports to WRC-19**
- ⇨ **Presentation and review of the regional groups' draft views, positions and common proposals**

** Updated information on meeting dates to be provided later on at: www.itu.int/en/events/Pages/Calendar-Events.aspx?sector=ITU-R

Thank you for your attention

Additional slides on

➢ **Agenda for WRC-19**
➢ **Radio services and other abbreviations**

Agenda for the 2019 World Radiocommunication Conference

WRC 2019

Broadband applications in the MS
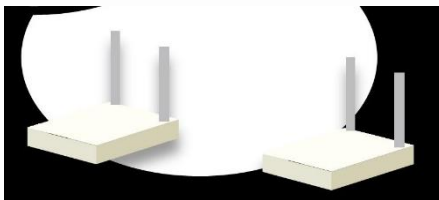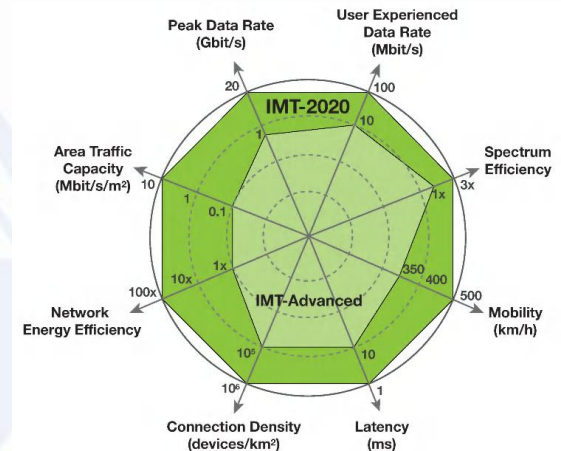## (WRC-19 agenda items 1.13 and 1.16)

The following bands, which are already allocated to mobile, will be studied with a view to an **IMT-2020 identification**:

- **24.25 – 27.5 GHz**
- **37 – 40.5 GHz**
- **42.5 – 43.5 GHz**
- **45.5 – 47 GHz**
- **47.2 – 50.2 GHz**
- **50.4 – 52.6 GHz**
- **66 – 76 GHz**
- **81 – 86 GHz**

The following bands will also be studied, although they **do not currently have global mobile allocations**:

- **31.8 – 33.4 GHz**
- **40.5 – 42.5 GHz**   ► **Res. 238 (WRC-15)**
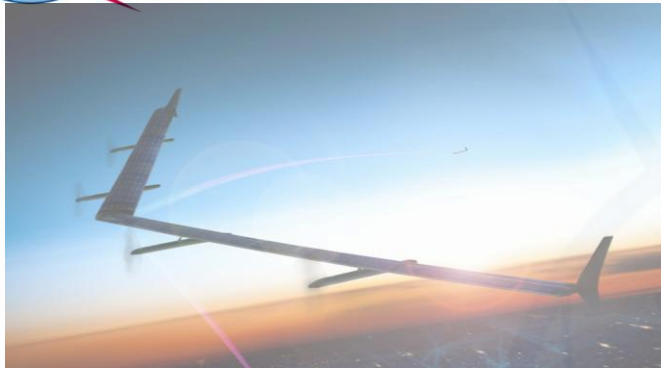- **47 - 47.2 GHz**

Appropriate regulatory actions, incl. additional MS allocations, for **WAS/RLAN** will be studied in the bands between **5 150-5 925 MHz**

► **Res. 239 (WRC-15)**

Studies for considering **appropriate regulatory actions for HAPS***, within existing FS alloc. at 47.2-47.5, 47.9-48.2 & 31.0-31.3**/27.9-28.2** GHz (**outside Reg. 2, +5 ADMs @6.5/6.5 MHz) <u>or</u>

study new bands: 38-39.5 GHz & 21.4-22*** & 24.25-27.5*** GHz (*high-altitude platform stations (HAPS);   *** in Region 2)
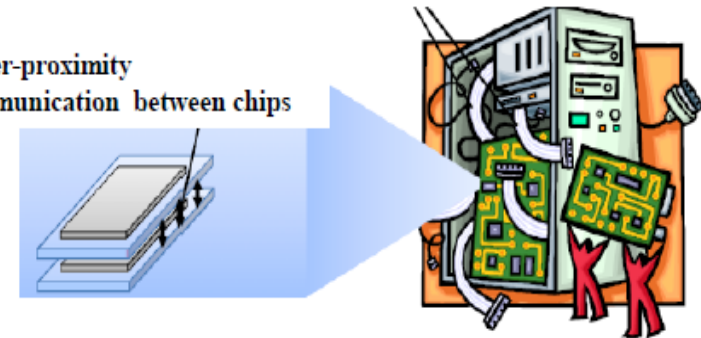
▶ **Res. 160 (WRC-15)**

Studies towards an **identification** for use by administrations for **LMS and FS applications** operating in the frequency range **275-450 GHz**

▶ **Res. 767 (WRC-15)**

Super-proximity communication between circuit board

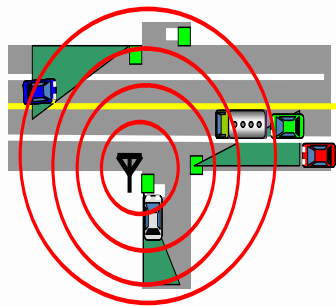Super-proximity communication between chips

New transport systems in the MS
(WRC-19 agenda items 1.11 & 1.12)

Studies to take necessary actions, as appropriate, to facilitate **global or regional harmonized bands to support railway radiocommunication systems** between train & trackside <u>within existing MS allocations</u>

► **Res. 236 (WRC-15)**

Studies to consider possible **global or regional harmonized bands**, to the maximum extent possible, for **implementation of evolving ITS**[*] <u>within existing MS allocations</u>

► **Res. 237 (WRC-15)**

[*] Intelligent Transport systems (ITS)

Maritime issues
(WRC-19 agenda items 1.8, 1.9.1 & 1.9.2)

Studies to consider possible **regulatory actions** to **support GMDSS** (Global Maritime Distress and Safety Systems) **modernization** and the introduction of **additional satellite systems** into the GMDSS

► **Res. 359 (Rev.WRC-15)**

Studies to consider **regulatory actions within** the band **156-162.05 MHz for autonomous maritime radio devices** to protect the GMDSS and AIS (Automatic Identification System)
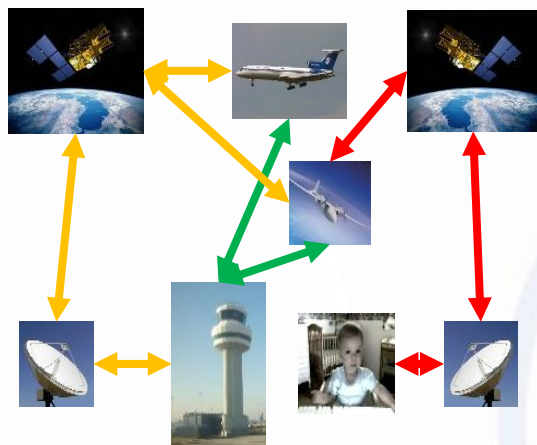
► **Res. 362 (WRC-15)**

Studies to consider RR MODs, including **new MMSS (E-s & s-E)** allocations, preferably **within 156.0125-157.4375 MHz & 160.6125-162.0375 MHz** of RR App. 18, to **enable a new VDES** (VHF data exchange system) **satellite component**

► **Res. 360 (Rev.WRC-15)**

Aeronautical and Amateur issues
(WRC-19 agenda items 1.10 & 1.1)

Studies to consider **spectrum needs & regulatory provisions** for **introduction and use of the GADSS** (Global Aeronautical Distress and Safety System)
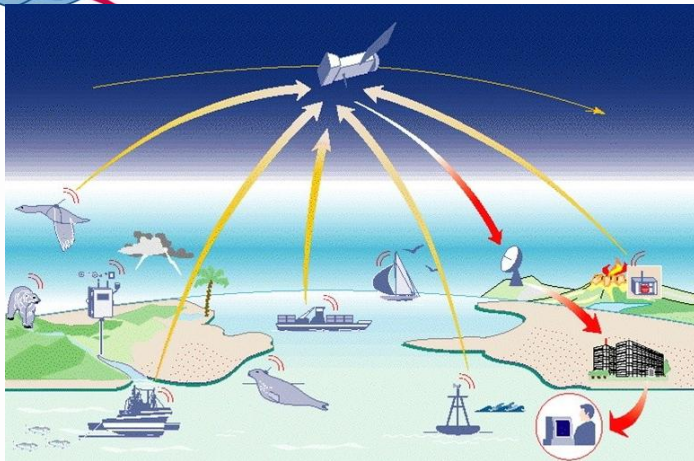
► **Res. 426 (WRC-15)**

Studies for consideration of an allocation of the band **50-54 MHz to the amateur service in Region 1** (towards a worldwide allocation for harmonized weak signal communications) ► **Res. 658 (WRC-15)**

Studies to consider **in-band power limits** for earth stations in **MetSat & EESS @ 401-403 MHz** for DCS* and in the **MSS @ 399.9-400.05 MHz**

► **Res. 765** **(WRC-15)**

Studies to consider possible upgrading of the **2ndary MetSat (s-E)** allocation **to 1mary** status & a possible **1mary EESS (s-E)** allocation **@ 460-470 MHz** for DCS

► **Res. 766** **(WRC-15)**

Study spectrum needs for **TT&C in the SOS** for non-GSO satellites with short duration missions & consider, if necessary, new SOS allocations

► **Res. 659** **(WRC-15)**

* Data Collection Systems (DCS) are used to monitor and predict climate change, monitor oceans, weather and water resources, weather forecasting and assisting in protecting biodiversity, improving maritime security
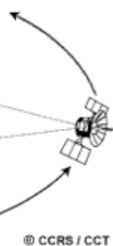
Satellite issues
(WRC-19 agenda items 1.4, 1.5, 1.6 & 7)

Consider results of studies on review, and possible revision if necessary, of RR App. **30** Annex 7 **limitations**, **incl. orbital position limitations**
► **Res. 557 (WRC-15)**

Studies to consider the **use of the bands 17.7-19.7 GHz (s-E) and 27.5 29.5 GHz (E-s)** by **earth stations in motion** communicating with GSO space stations **in the FSS** and take appropriate action ► **Res. 158 (WRC-15)**

Studies on development of a **regulatory framework for non-GSO FSS systems** that may operate in the bands **37.5-39.5 GHz (s-E), 39.5-42.5 GHz (s-E), 47.2-50.2 GHz (E-s) and 50.4-51.4 GHz (E-s)**

► **Res. 159 (WRC-15)**

Satellite Regulatory issues

► **Res. 86 (Rev.WRC-07)**

Satellite regulatory issues
(WRC-19 agenda item 7)

✓ **Seven issues identified so far under AI 7:**

A. Factors related to the **BiU of frequency assignments** of **non-GSO systems subject to coordination**

B. **Modification** (characteristics reduction) of a **recorded assignment** under RR App. **30** & **30A** Reg. 1 and 3 List

C. Discrepancy and/or inconsistency between RR provisions dealing with any changes to characteristics of assignment

D. **Ident.** specific **sat. networks & systems** to coordinate with, under RR Nos. **9.12**, **9.12A** and **9.13** or **9.21**

E. Harmonization of RR App. **30B** with RR App. **30** & **30A**

F. Enhancement of RR App. **30B** provisions to observe the principles based on which it was initially established

G. Updating ref. sit. for networks in RR App. **30** & **30A** after conversion into definitive of provisionally recorded assign^{nts}

Other ITU-R Studies for WRC-19
(WRC-19 agenda item 9.1)

9.1.1 — **Res. 212 – Terrestrial & Satellite components of IMT** (Rev.WRC-15) co-existence & compatibility @1885-2025 & 2110-2200 MHz

9.1.2 — **Res. 761 – IMT and BSS sound @ 1452-1492 MHz in Regions 1 and 3** (WRC-15)

9.1.3 — **Res. 157 – Technical/Operational/Regulatory studies for new N-GSO Sat. in "C-Band" allocated to FSS** (WRC-15)

9.1.4 — **Res. 763 – Stations on board sub-orbital vehicles** (WRC-15)

9.1.5 — **Res. 764 – IbR* of Rec. ITU-R M.1638-1 & M.1849-1 (MS(RLAN)@5GHz & new radar characteristics)** (WRC-15)

9.1.6 — **Res. 958 – 1) Urgent studies on Wireless Power Transmission (WPT) for electric vehicles** (WRC-15)

9.1.7 — **Res. 958 – 2) Managing unauthorized operations of Earth Station terminals** (WRC-15)

9.1.8 — **Res. 958 – 3) Narrowband & BB machine-type communication infrastructures** (WRC-15)

9.1.9 — **Res. 162 – FSS needs @ 51.4-52.4 GHz** (WRC-15)

* Incorporation by Reference

WRC-23 preliminary items & Resp. Groups

5 preliminary agenda items, Res. 810 (WRC-15)

Responsible ITU-R Groups

2.1 Res. 361 – Spectrum for GMDSS modernization & (WRC-15)   implementation of e-navigation → **WP 5B**

2.2 Res. 656 – Possible new allocations for EESS (active) (WRC-15)   for spaceborne radar sounders @ 45 MHz

WP 7C

2.3 Res. 657 – Spectrum needs & designation of radio (WRC-15)   services for space weather sensors

2.4 Res. 161 – Possible new allocations for (WRC-15)   FSS @ 37.5-39.5 GHz → **WP 4A**

2.5 Res. 235 – Spectrum use and needs of existing services (WRC-15)   @ 470-960 MHz in Region 1 and possible   regulatory actions @ 470-694 MHz in Region 1

none

Radio service abbreviations (1/2)

Abbreviations	Radio services	RR definition
AMS	aeronautical mobile service	No. **1.32**
AM(R)S	aeronautical mobile (route) service	No. **1.33**
AMSS	aeronautical mobile-satellite service	No. **1.35**
AMS(R)S	aeronautical mobile-satellite (route) service	No. **1.36**
ARNS	aeronautical radionavigation service	No. **1.46**
ARNSS	aeronautical radionavigation-satellite service	No. **1.47**
ARS	amateur service	No. **1.56**
ARSS	amateur-satellite service	No. **1.57**
BS	broadcasting service	No. **1.38**
BSS	broadcasting-satellite service	No. **1.39**
EESS	Earth exploration-satellite service	No. **1.51**
FS	fixed service	No. **1.20**
FSS	fixed-satellite service	No. **1.21**
ISS	inter-satellite service	No. **1.22**
LMS	land mobile service	No. **1.26**
LMSS	land mobile-satellite service	No. **1.27**
MetAids	meteorological aids service	No. **1.50**
MetSat	meteorological-satellite service	No. **1.52**

Radio service abbreviations (2/2)

Abbreviations	Radio services	RR definition
MMS	maritime mobile service	No. **1.28**
MMSS	maritime mobile-satellite service	No. **1.29**
MRNS	maritime radionavigation service	No. **1.44**
MRNSS	maritime radionavigation-satellite service	No. **1.45**
MS	mobile service	No. **1.24**
MSS	mobile-satellite service	No. **1.25**
RAS	radio astronomy service	No. **1.58**
RDS	radiodetermination service	No. **1.40**
RDSS	radiodetermination-satellite service	No. **1.41**
RLS	radiolocation service	No. **1.48**
RLSS	radiolocation-satellite service	No. **1.49**
RNS	radionavigation service	No. **1.42**
RNSS	radionavigation-satellite service	No. **1.43**
SOS	space operation service	No. **1.23**
SFTSS	standard frequency and time signal service	No. **1.53**
SFTSSS	standard frequency and time signal-satellite service	No. **1.53**
SRS	space research service	No. **1.55**

Abbreviations	Description	RR Nos.
ADS-B	Automatic Dependent Surveillance-Broadcast	-
AIS	Automatic Identification System	-
Art. or AP/App	An Article or an Appendix of the RR	-
BB	Broadband	-
BIPM	International Bureau of Weights and Measures	-
(D)BiU	(Date of) Bringing Into Use	-
BR	ITU Radiocommunication Bureau	-
DCS	Data Collection System	-
E-s, s-E	Earth-to-space, space-to-Earth	-
ES	Earth station	No. **1.63**
ESIM	ES In Motion	-
ESV	ES on board Vessels	-
GE06	Geneva 2006	-
GFT	Global Flight Tracking	-

Other abbreviations (2/3)

Abbreviations	Description	RR Nos.
GMDSS	Global Maritime Distress and Safety System	-
GSO	Geostationary-Satellite Orbit	No. **1.190**
HAPS	High Altitude Platform Station	No. **1.66A**
HF VHF UHF	High Frequency: 3 to 30 MHz Very High Frequency: 30 to 300 MHz Ultra High Frequency: 300 to 3000 MHz	No. **2.1**
ICAO	International Civil Aviation Organization	-
IMT	International Mobile Telecommunications	-
ITS	Intelligent Transport Systems	-
ITU	International Telecommunication Union	-
ITU-R	ITU Radiocommunication Sector	-
PPDR	Public Protection and Disaster Relief	-
SARPs	Standards and recommended practices	Nos. **5.2** to **5.9**
R1, R2, R3	RR Regions 1, 2 or 3	Nos. **5.2** to **5.9**

Abbreviations	Description	RR Nos.
Rec. / Rap.	Recommendation / Report	-
Res.	Resolution	-
RLAN	Radio Local Area Network(s)	-
RR	ITU Radio Regulations	-
RRB	ITU Radio Regulations Board	-
TT&C	Telemetry, Tracking and Command	(See Nos. **1.131**-**1.136**)
UA / UAS	Unmanned Aircraft / Unmanned Aircraft Systems	-
UTC	Coordinated Universal Time	No. **1.14**
VDES	VHF Data Exchange System	-
VSAT	Very Small Aperture Terminal	-
WAIC	Wireless Avionics Intra-Communications	-
WAS	Wireless Access System(s)	-
WRC	World Radiocommunication Conference	-