Radio Assembly & World Radio Conference 2015

Workshop on National Spectrum Management and Spectrum Management System for Developing Countries (SMS4DC)

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Suva, Fiji

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ITU at a Glance

Specialized Agencies of the United Nations

WHO ILO UPU ICAO WMO IMO IAEA

WB UNWTO FAO IFAD UNIDO WIPO WFP IMF

Specialized UN agency with focus on Telecommunication / ICTs

ITU Presence

ITU – Our strength

Our numbers

193

MEMBER STATES

700

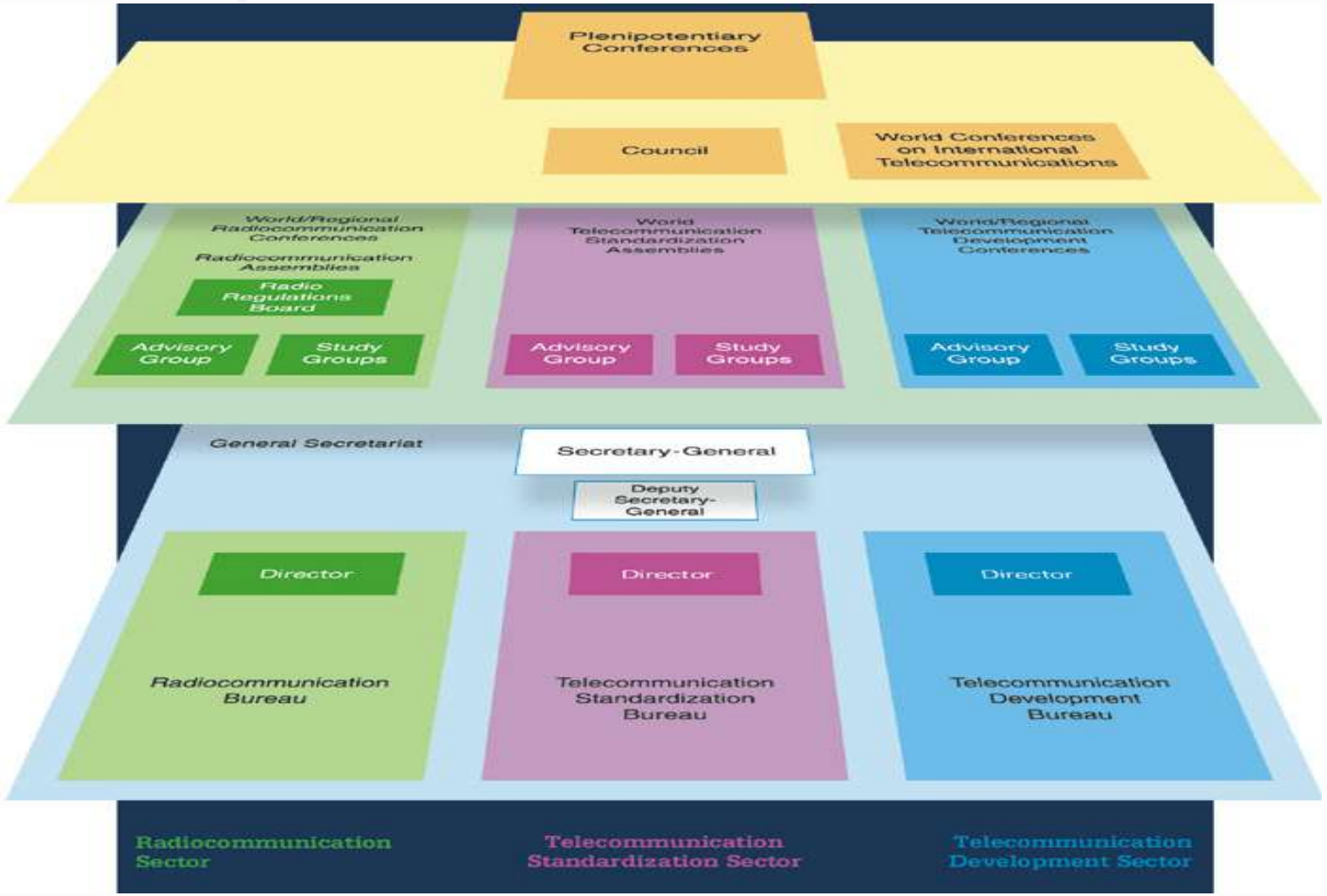
PRIVATE SECTOR ORGANIZATIONS

100

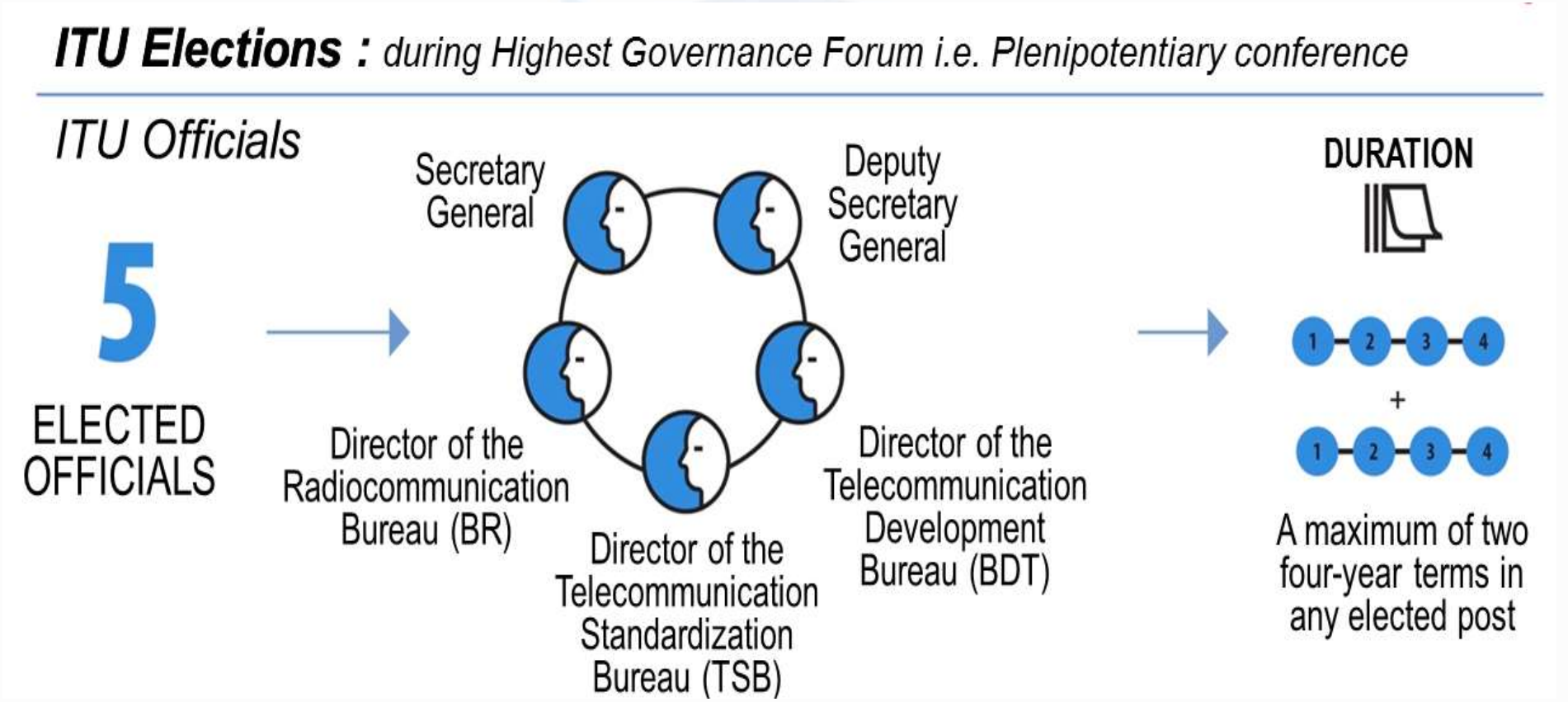
ACADEMIA MEMBERS

ITU – Organization

Each sector has separate mandate, but all work cohesively towards connecting the world



ITU – Organization



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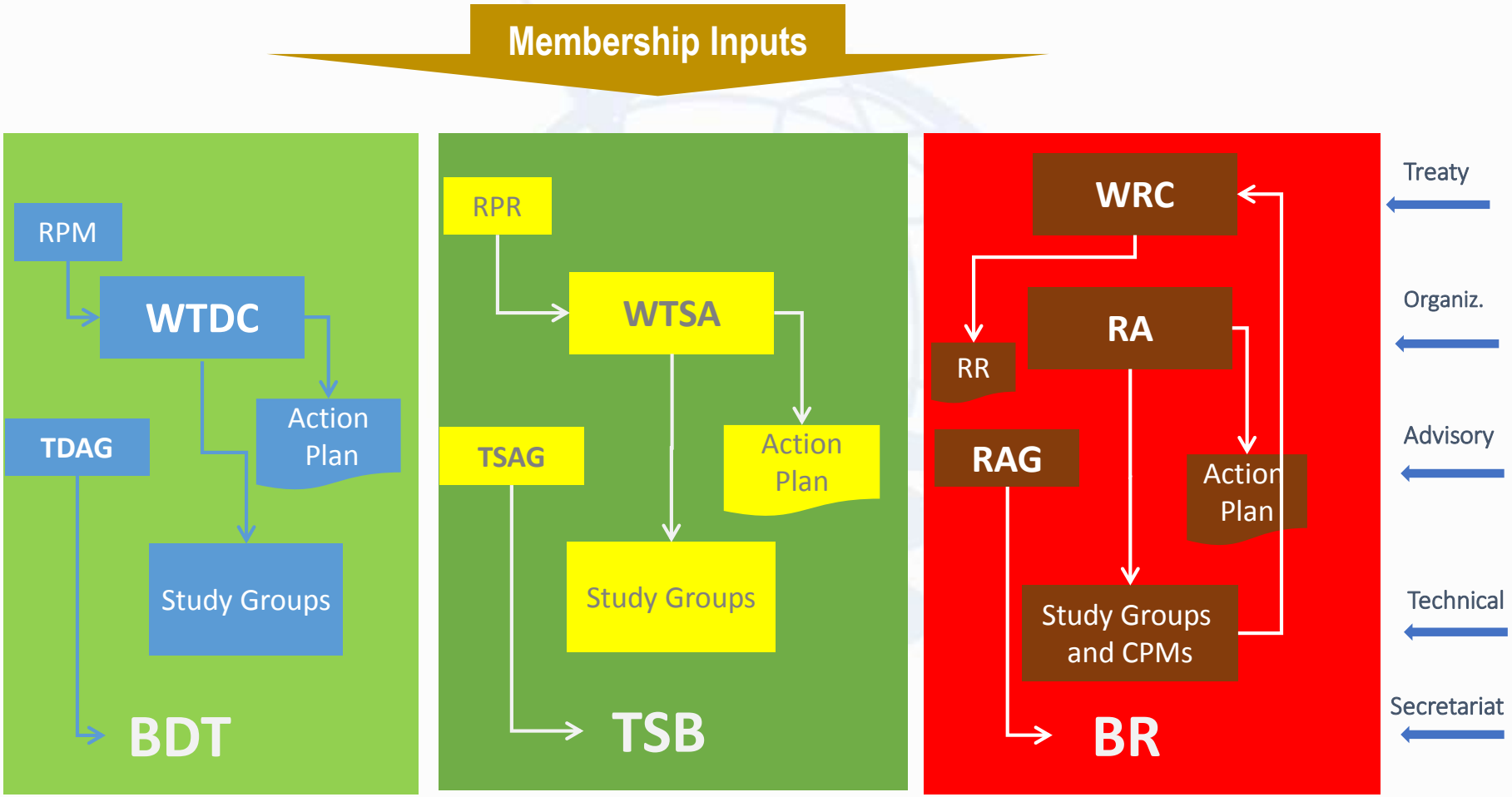


CENTRE INTERNATIONAL
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GENÈVE
International Telecommunication Union
RADIOCOMMUNICATION
ASSEMBLY
2015
GENEVA, SWITZERLAND
26 – 30 OCTOBER 2015
ITU
RAC-15
150
1865
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Radio Assemblies

- **Radiocommunication Assemblies (RA) are responsible for the structure, programme and approval of radiocommunication studies**
- **They are normally convened every three or four years and may be associated in time and place with World Radiocommunication Conferences (WRCs)**
- **The Assemblies:**
  - **ASSIGN** conference preparatory work and other questions to the Study Groups;
  - **RESPOND** to other requests from ITU conferences;
  - **SUGGEST** suitable topics for the agenda of future WRCs;
  - **APPROVE** and issue ITU-R Recommendations and ITU-R Questions developed by the Study Groups;
  - **SET** the programme for Study Groups, and disband or establish Study Groups according to need.

Study Group 1 (SG 1)

Spectrum Management

➢ **Scope:**

Spectrum management principles and techniques, general principles of sharing, spectrum monitoring, long-term strategies for spectrum utilization, economic approaches to national spectrum management, automated techniques and assistance to developing countries in cooperation with the Telecommunication Development Sector.

➢ **Structure:**

- Working Party 1A (WP 1A) - Spectrum engineering techniques
- Working Party 1B (WP 1B) - Spectrum management methodologies and economic strategies
- Working Party 1C (WP 1C) - Spectrum monitoring

Study Group 3 (SG 3)

Radiowave Propagation

➢ **Scope:**

Propagation of radio waves in ionized and non-ionized media and the characteristics of radio noise, for the purpose of improving radiocommunication systems.

➢ **Structure:**

- *Working Party 3J (WP 3J) - Propagation fundamentals*
- *Working Party 3K (WP 3K) - Point-to-area propagation*
- *Working Party 3L (WP 3L) - Ionospheric propagation and radio noise*
- *Working Party 3M (WP 3M) - Point-to-point and Earth-space propagation*

Study Group 4 (SG 4)

Satellite Services

- **Scope:**

Systems and networks for the fixed-satellite service, mobile-satellite service, broadcasting-satellite service and radiodetermination-satellite service.

- **Structure:**

  - *Working Party 4A (WP 4A) - Efficient orbit/spectrum utilization for FSS and BSS*
  - *Working Party 4B (WP 4B) - Systems, air interfaces, performance and availability objectives for FSS, BSS and MSS, including IP-based applications and satellite news gathering*
  - *Working Party 4C (WP 4C) - Efficient orbit/spectrum utilization for MSS and RDSS*

Study Group 5 (SG 5)

Terrestrial Services

- **Scope:**

Systems and networks for fixed, mobile, radiodetermination, amateur and amateur-satellite services.

- **Structure:**
  - *Working Party 5A (WP 5A) - Land mobile service above 30 MHz (excluding IMT); wireless access in the fixed service; amateur and amateur-satellite services*
  - *Working Party 5B (WP 5B) - Maritime mobile service including Global Maritime Distress and Safety System (GMDSS); aeronautical mobile service and radiodetermination service*
  - *Working Party 5C (WP 5C) - Fixed wireless systems; HF and other systems below 30 MHz in the fixed and land mobile services*
  - *Working Party 5D (WP 5D) - IMT Systems*
  - *Task Group 5/1 - WRC-19 Agenda item 1.13*

Study Group 6 (SG 6)

Broadcasting Service

➢ **Scope:**

Radiocommunication broadcasting, including vision, sound, multimedia and data services principally intended for delivery to the general public. to delivery nodes, and secondary distribution to consumers.

- **Structure**
  - *Working Party 6A (WP 6A) - Terrestrial broadcasting delivery*
  - *Working Party 6B (WP 6B) - Broadcast service assembly and access*
  - *Working Party 6C (WP 6C) - Programme production and quality assessment*

Study Group 7 (SG 7)

Science Services

Scope:

- *Systems for space operation, space research, Earth exploration and meteorology, including the related use of links in the inter satellite service.*
- *Systems for remote sensing, including passive and active sensing systems, operating on both ground-based and space-based platforms.*
- *Radio astronomy and radar astronomy.*
- *Dissemination, reception and coordination of standard-frequency and time-signal services, including the application of satellite techniques, on a worldwide basis.*

Structure:

- *Working Party 7A (WP 7A) - Time signals and frequency standard emissions*
- *Working Party 7B (WP 7B) - Space radiocommunication applications*
- *Working Party 7C (WP 7C) - Remote sensing systems*
- *Working Party 7D (WP 7D) - Radio astronomy*

Task Group 5/1

WRC-19 Agenda item 1.13

- The first session of the Conference Preparatory Meeting for WRC-19 (CPM19-1), invited Study Group 5 to establish a Task Group (TG 5/1) which will be the responsible group for WRC-19 agenda item 1.13

- Agenda item 1.13:

*"to consider identification of frequency bands for the future development of International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution **238 (WRC-15)**",*

RA – 2015 (General Information)

- **Following the adoption of Resolution 1343 by the council of ITU, the Radiocommunication Assembly 2015 (RA-15) took place in Geneva, Switzerland from 26th to 30th October 2015.**
- **5 committees were formed to carry out the tasks of RA-15, namely:**
  - *COM 1 - Steering Committee*
  - *COM 2 - Budget control*
  - *COM 3 - Editorial Committee*
  - ***COM 4 - Structure and work programme of the Study Groups***
  - *COM 5 - Working methods of the RA and SGs*
- **It was noted in the report from Dir-BR to the RA-15 that :**
  - *Overall 22% more documents were produced by SGs than the previous study period with most documents under SG5.*
- **The role of academia has been considered most relevant in SG3 and SG7 of ITU-R**
- **In addition reports from 6 BR SGs and information and Administrative documents from the secretariat, a total of 34 contributions were made to plenary before the start of the RA-15.**

RA – 2015 Outcomes

- **In addition reports from 6 BR SGs and information and Administrative documents from the secretariat, a total of 34 contributions were made to plenary before the start of the RA-15.**

- **RA-15 agreed to**
  - **6** new resolutions
  - Modification to **30** existing resolutions
  - Suppressed **5** existing resolutions.
  - No change was made to **5** existing resolutions.

441 registered Participants

RA – 2015 Outcomes

➢ *Category: Bridging Digital Divide*

- **New Resolution ITU-R 69:** *Development and deployment of international public telecommunications via satellite in developing countries*

➢ *Category: Spectrum Management*

- **Revision of Resolution ITU-R 40-3 -** *Worldwide databases of terrain height and surface features*

  The resolutions considers that the propagation predictions are improved by the inclusion of more detailed information on terrain heights and surface features and suitable digital maps. It encourage administrations and organizations involved in the production of terrain maps to make databases available as such availability of digital maps of terrain height and surface features would be of considerable benefit to developing countries in the planning of their existing and newly introduced services. Also resolved that the further development of SMS4DC should also take into account.

- **Revision of Res ITU-R 11-4:** *Further development of the spectrum management system for developing countries*

- **Revision of Res. ITU-R 22-3:** *Improvement of national radio spectrum management practices and techniques*

RA – 2015 Outcomes

➢ *Category: Wireless Broadband*

- **Res. ITU-R 56-1:** *Naming for International Mobile Telecommunications*

Since ITU is the internationally recognized entity that has sole responsibility to define and to recommend the standards and frequency arrangements for IMT systems, with the collaboration of other organizations such as standard development organizations, universities, industry organizations and with partnership projects, forums, consortia and research collaborations, therefore the RA-15 debated especially on naming of IMT systems.

- *the existing term IMT-2000 continues to be relevant and should continue to be utilized;*
- *the existing term IMT-Advanced continues to be relevant and should continue to be utilized;*
- *However for systems, system components, and related aspects that include new radio interface(s) which support the new capabilities of systems beyond IMT-2000 and IMT-Advanced, the term "IMT-2020" be applied*
- *In addition it was resolved that the term "IMT" would be considered the root name that encompasses all of IMT-2000, IMT-Advanced and IMT-2020 collectively.*

➢ *Category: Accessibility for persons with disabilities*

- **New Resolution ITU-R 67:** *Telecommunication/ICT accessibility for persons with disabilities and persons with specific needs*

The proposal of new resolution from United Arab Emirates attempts to include this issue in the list of topics of common interest of all the three sectors in order to reach an integrated approach which is according to Resolution 191 of the Plenipotentiary Conference, Busan 2014 on Strategy for the Coordination of efforts among the three Sectors of the Union (ITU-R, ITU-T and ITU-D).

➢ *Category: Emergency Telecommunication, Disaster response and relief*

- **Suppression of Res. ITU-R 53-1:** *The use of radiocommunications in disaster response and relief*

The resolution was adopted in the past in order to serve a specific need to undertake studies and develop guidelines related to the management of radiocommunications in disaster prediction, detection, mitigation and relief collaboratively and cooperatively within ITU and with organizations external to the Union. This work was considered to have been accomplished in general and therefore the **resolution was suppressed with any remaining relevant matters consolidated in the ITU-R 55-1**

- **Revision of Res. ITU-R 55-1:** *ITU studies of disaster prediction, detection, mitigation and relief*

The resolution considers the importance of radiocommunication systems in assisting disaster management through techniques for early warning, prevention, mitigation and relief and also takes note of Resolution 34 (Rev. Dubai, 2014) of the World Telecommunication Development Conference, on the role of telecommunications/information and communication technologies in disaster preparedness, early warning, rescue, mitigation, relief and response. Based on the agreement of the delegations the resolution.

RA – 2015 Outcomes

➢ *Category: Climate change and green ICTs*

- **Revision to Resolution ITU-R 60 -** *Reduction of energy consumption for environmental protection and mitigating climate change by use of ICT/radiocommunication technologies and systems*

The resolution considers that the issue of climate change is rapidly emerging as a global concern and requires global collaboration because climate change is one of the major factors causing emergency situations and natural disasters afflicting humankind.

➢ *Other resolutions and recommendations*

- **New Resolution ITU-R 66:** *Studies related to wireless systems and applications for the development of the Internet of Things (IoT)*

The resolution while recognizing that the IoT is a concept encompassing various platforms, applications, and technologies that are implemented under a number of radiocommunication services also notes that the implementation of the Internet of Things currently does not require specific regulatory provisions in the Radio Regulations.

- **Revision of Recommendation ITU-R M.1036-4:** *Frequency arrangements for implementation of the terrestrial component of International Mobile Telecommunications (IMT) in the bands identified for IMT in the Radio Regulations (RR)*

The revisions to this recommendation were debated at length and were finally agreed during the 5th plenary session of the RA-15. The recommendation provides guidance on the selection of transmitting and receiving frequency arrangements for the terrestrial component of IMT systems as well as the arrangements themselves, with a view to assisting administrations on spectrum-related technical issues relevant to the implementation and use of the terrestrial component of IMT in the bands identified in the RR. The frequency arrangements are recommended from the point of view of enabling the most effective and efficient use of the spectrum to deliver IMT services – while minimizing the impact on other systems or services in these bands – and facilitating the growth of IMT systems.

- **New Recommendation ITU-R M.[BSMS700] -** *Specific unwanted emission limit of IMT mobile stations operating in the frequency band 694-790 MHz to facilitate protection of existing services in Region 1 in the frequency band 470-694 MHz*

This Recommendation provides guidance to administrations on specific unwanted emission levels of IMT mobile stations operating in the frequency band 694-790 MHz in order to facilitate protection of existing services in the frequency band 470-694 MHz in Region 1. In essence the recommendation may be referred by Administration in using the 700 MHz band for IMT which is being under consideration by several ITU administrations which are also member of APT.

RA – 2015 Outcomes

- List of All resolutions of RA-15

- List of New Questions for ITU-R Study Groups

World Radiocommunication Conference 2015 (WRC-15)

Geneva, Switzerland, 2-27 November 2015

Agenda for the WRC-15
(Resolution 807 (WRC-12))

Items:

1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9.1, 1.9.2, 1.10, 1.11, 1.12, 1.13, 1.14, 1.15, 1.16, 1.17, 1.18, 2, 4, 7, 9.1, 9.3 and 10

CPM Chapter 1

Mobile and Amateur Issues

1.1 to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for IMT and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Res. 233 (WRC-12);

1.2 to examine the results of ITU-R studies, in accordance with Res. 232 (WRC-12), on the use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and take the appropriate measures;

1.3 to review and revise Res. 646 (Rev.WRC-12) for broadband PPDR, in accordance with Res. 648 (WRC-12);

1.4 to consider possible new allocation to the amateur service on a secondary basis within the band 5.25-5.45 MHz in accordance with Res. 649 (WRC-12);

CPM Chapter 2

Science Issues

1.11 to consider a primary allocation for the EESS (Earth-to-space) in the 7-8 GHz range, in accordance with Res. 650 (WRC-12);

1.12 to consider an extension of the current worldwide allocation to the EESS (active) in the frequency band 9.3-9.9 GHz by up to 600 MHz within the frequency bands 8.7-9.3 GHz and/or 9.9-10.5 GHz, in accordance with Res. 651 (WRC-12);

1.13 to review No. 5.268 with a view to examining the possibility for increasing the 5 km distance limitation and allowing SRS (space-to-space) use for proximity operations by space vehicles communicating with an orbiting manned space vehicle, in accordance with Res. 652 (WRC-12);

1.14 to consider the feasibility of achieving a continuous reference time-scale, whether by the modification of coordinated UTC or some other method, and take appropriate action, in accordance with Res. 653 (WRC-12);

CPM Chapter 3

Aeronautical, Maritime and Radiolocation Issues

1.5 to consider the use of frequency bands allocated to the FSS not subject to App.s 30, 30A and 30B for the control and non-payload communications of UAS in non-segregated airspaces, in accordance with Res. 153 (WRC-12);

1.15 to consider spectrum demands for on-board communication stations in the MMS in accordance with Res. 358 (WRC-12);

1.16 to consider regulatory provisions and spectrum allocations to enable possible new AIS applications and possible new applications to improve maritime RL in accordance with Res. 360 (WRC-12);

1.17 to consider possible spectrum requirements/regulatory actions, including appropriate aeronautical allocations, to support wireless avionics intra-com. (WAIC), in accordance with Res. 423 (WRC-12);

1.18 to consider a primary allocation to the radiolocation service for automotive applications in the 77.5-78.0 GHz in accordance with Res. 654 (WRC-12);

CPM Chapter 4

Satellite Services, FSS

1.6 to consider possible additional primary allocations:

1.6.1 to the FSS (E-to-s and s-to-E) of 250 MHz in the range between 10 GHz and 17 GHz in Region 1;

1.6.2 to the FSS (E-to-s) of 250 MHz in Region 2 and 300 MHz in Region 3 within the range 13-17 GHz; and review the regulatory provisions on the current allocations to the FSS within each range, taking into account Res.s151&152 (WRC-12);

1.7 to review the use of the band 5.091-5.15 GHz by the FSS (E-to-s) (limited to feeder links of non-GSO mobile-satellite systems in the MSS) in accordance with Res. 114 (Rev.WRC-12);

1.8 to review the provisions relating to ESVs, (Res.909 (WRC-12));

1.9 to consider, in accordance with Res. 758 (WRC-12):

1.9.1 possible new allocations to the FSS in the 7.15-7.25 GHz (s-to-E) and 8.4-8.5 GHz (E-to-s), subject to sharing conditions;

CPM Chapter 4

Satellite Services, MSS

1.9 to consider, in accordance with Resolution 758 (WRC-12):

1.9.2 the possibility of allocating the bands 7 375-7 750 MHz and 8 025-8 400 MHz to the maritime-mobile satellite service and additional regulatory measures, depending on the results of appropriate studies;

1.10 to consider spectrum requirements and possible additional spectrum allocations for the mobile-satellite service in the Earth-to-space and space-to-Earth directions, including the satellite component for broadband applications, including International Mobile Telecommunications (IMT), within the frequency range from 22 GHz to 26 GHz, in accordance with Resolution 234 (WRC-12);

CPM Chapter 5

Satellite Regulatory Issues

7 to consider possible changes, and other options, in response to Res. 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, an advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Res. 86 (Rev.WRC-07) to facilitate rational, efficient, and economical use of radio frequencies and any associated orbits, including the GSO orbit;

9 to consider and approve the Report of the Director of the BR, in accordance with Article 7 of the Convention:

9.1 on the activities of the Radiocommunication Sector since WRC-12;

9.2 on any difficulties or inconsistencies encountered in the application of the Radio Regulations; and

9.3 on action in response to Res. 80 (Rev.WRC-07);

Chapter 6

General Issues

2 to examine the revised ITU-R Rec.s incorporated by reference in Radio Reg. communicated by RA, in accordance with Res. 28 (Rev.WRC-03), and to decide whether or not to update the corresponding references in Radio Reg. in accordance with principles contained in Annex 1, Res. 27 (Rev.WRC-12);

2.1 to consider spectrum requirements and additional spectrum allocations in the radio-determination to support UAS operation in non-segregated airspace;

2.2 to review the use of the band 5 091-5 150 MHz by the FSS (E-to-s) (limited to feeder links of the non-GSO MSS) in accordance with Res. 114 (Rev.WRC-03)

4 to review the res.s and rec.s of previous WRCs with a view to their possible revision, replacement/ abrogation (Res.95 (Rev.WRC-07))

Chapter 6

General Issues

9 to consider and approve the Report of the Director of the BR, in accordance with Article 7 of the Convention:

9.1 on the activities of the Radiocommunication Sector since WRC-12;

10 to recommend to Council items for inclusion in agenda for next WRC, and to give its views on preliminary agenda for subsequent WRC and on possible agenda items for future WRCs, in accordance with Article 7 of Convention,

WRC-15 (General Information)

- Around 3300 participants from 162 Member States,
- Around 500 participants representing 130 other entities, including industry, also attended the conference as observers
- 667 Documents submitted before WRC-15 which include 2700 proposals
- WRC-15 addressed over 40 topics related to frequency allocation and frequency sharing for the efficient use of spectrum and orbital resources.

WRC-15 (General Information)

Chairman of the Conference:	**Mr Festus Yusufu Narai Daudu (Nigeria)**	
Vice-Chairmen of the Conference:	Mr A. Jamieson (New Zealand) Mr Y. Al-Bulushi (Oman) Mr D. Obam (Kenya) Mrs D. Tomimura (Brazil) Mr A. Kühn (Germany) Mr N. Nikiforov (Russian Federation)	
Committee 1: **(Steering)**	(Composed of the Chairman and Vice-Chairmen of the Conference and of the Chairmen and Vice-Chairmen of the Committees.)	
Committee 2: **(Credentials)**	Chairman:	Mr N. Meaney (Australia)
Committee 3: **(Budget Control)**	Chairman:	Mr A. Kadirov (Uzbekistan)
Committee 4: **Specified agenda items (a.i.)** **1.1 , 1.2, 1.3, 1.4, 1.5 (see Note), 1.15, 1.16, 1.17, 1.18, 3*, 5*, 9*, 9.1*, 9.2*, Global flight tracking**	Chairman:	Mr M. Fenton (United Kingdom)
Committee 5: **Specified agenda items** **1.6 (1.6.1, 1.6.2), 1.7, 1.8, 1.9 (1.9.1, 1.9.2), 1.10, 1.11, 1.12, 1.13, 1.14, 3*, 5*, 7, 9*, 9.1*, 9.2*, 9.3**	Chairman:	Mr K. Al Awadhi (United Arab Emirates)
Committee 6: **Specified agenda items** **2, 3*, 4, 5*, 6, 8, 9*, 9.1*, 9.2*, 10**	Chairman:	Mrs A. Allison (USA)
Committee 7: **(Editorial)**	Chairman:	Mr C. Rissone (France)

General Information

- **Committee 1**: *Steering Committee*
- **Committee 2:** *Credentials Committee*
- **Committee 3:** *Budget Control Committee*
- **Committee 4, 5 and 6:** *Specified Agenda Items Committees*
- **Committee 7:** *Editorial Committee*

Committee 4 (mainly terrestrial issues)

Working Group 4A (Aeronautical and Radiolocation)

- Sub-Working Group to deal with Agenda item 1.5 (SWG 4A1 a.i. 1.5)
- Sub-Working Group to deal with Agenda item 1.17 (SWG 4A2 a.i. 1.17)
- Sub-Working Group to deal with Agenda item 1.18 (SWG 4A3 a.i. 1.18)
- Sub-Working Group to deal with Agenda item on Global Flight Tracking (GFT) (SWG 4A4 - GFT)

Working Group 4B (Maritime and Amateur)

- Sub-Working Group to deal with Agenda item 1.4 (SWG 4B1 a.i. 1.4)
- Sub-Working Group to deal with Agenda item 1.16 (SWG 4B2 a.i. 1.16)
- Agenda item 1.15 (to consider spectrum demands for on-board communication stations in the maritime mobile service in accordance with Resolution 358 (WRC 12) will be treated directly at the working group level.

Working Group 4C (Mobile and PPDR)

- Sub-Working Group to deal with agenda item 1.1 (SWG 4C1 a.i. 1.1)
- Sub-Working Group to deal with agenda item 1.2 (SWG 4C2 a.i. 1.2)
- Sub-Working Group to deal with agenda items 1.3 and 9.1; 9.1.7 (SWG 4C3 a.i. 1.3, issue 9.1.7)

Committee 5 (mainly satellite issues)

- **Working Group 5A (Space Science)**
  - Plenary to deal with Agenda items 1.13, 5 (Resolution (Rev.WRC-03) 74) and relevant parts of 9.2
  - Sub-Working Group to deal with Agenda item 1.11 (SWG 5A1 a.i. 1.11)
  - Sub-Working Group to deal with Agenda item 1.12 (SWG 5A2 a.i. 1.12)
  - Sub-Working Group to deal with Agenda item 1.14 (SWG 5A3 a.i. 1.14)

- **Working Group 5B (Satellite Allocation)**
  - Sub-Working Group to deal with agenda item 1.6 (SWG 5B1 a.i. 1.6)
  - Sub-Working Group to deal with agenda item 1.7 (SWG 5B2 a.i. 1.7)
  - Sub-Working Group to deal with agenda item 1.9.1 (SWG 5B3 a.i. 1.9.1)
  - Sub-Working Group to deal with agenda item 1.9.2 (SWG 5B4 a.i. 1.9.2)
  - Sub-Working Group to deal with agenda item 1.10 (SWG 5B5 a.i. 1.10)

- **Working Group 5C (Satellite Regulatory Issues)**
  - Sub-Working Group to deal with agenda item 1.8 (SWG 5C1 a.i. 1.8)
  - Sub-Working Group to deal with agenda item 7 and related parts of agenda items 9.2 and 9.3 (SWG 5C2 a.i. 7)
  - Sub-Working Group to deal with agenda item 9.1.2 (SWG 5C3 a.i. 9.1.2)
  - Sub-Working Group to deal with agenda item 9.2 (SWG 5C4 a.i. 9.2)

Committee 6

- **Working Group 6A (WG 6A General Issues)**
  - Sub-Working Group 6A1 on WRC-15 agenda items 2 and 4 (SWG 6A1 a.i. 2, 4 (IbR & Res. 95))
  - Sub-Working Group 6A2 on WRC-15 agenda item 9.2*, Issues not related to satellite (SWG 6A2 a.i. 9.2.NSat)
- **Working Group 6B (WG 6B Next WRC)**
  - Agenda of future conferences, a.i. 6, 10
  - 1 Ad-Hoc Group (AHG) 6B1
  - 2 Ad-Hoc Group (AHG) 6B2
  - 3 Ad-Hoc Group (AHG) 6B3
  - 4 Ad-Hoc Group (AHG) 6B4
- **Note: Contributions for WRC-23 agenda are proposed to be considered separately**

Summary of Key Outcomes of WRC -15

Outcomes of WRC-15

Global Flight Tracking

- Agreement was reached on the allocation of RF spectrum for global flight tracking in civil aviation for improved safety. The frequency band **1,087.7 – 1,092.3 MHz** has been allocated to the aeronautical mobile-satellite service (Earth-to-space) for reception by space stations of Automatic Dependent Surveillance-Broadcast (ADS-B) emissions from aircraft transmitters

Emergency Communications

- WRC-15 identified spectrum in the **694 – 894 MHz** band to facilitate mobile broadband communications for robust and reliable mission critical emergency services in **public protection and disaster relief** (PPDR), such as police, fire, ambulances and disaster response teams

Outcomes of WRC-15

Search & Rescue

- WRC-15 **reinforced** protection to Search and Rescue beacons that transmit in the **406 – 406.1 MHz** band signals to uplink to search and rescue satellites
- Resolution 205 was modified to ensure that frequency drift characteristics of radiosondes are taken into account when operating above 405 MHz to avoid drifting close to 406 MHz
- Administrations are requested to **avoid making new frequency assignments** for the mobile and fixed services within the adjacent frequency bands to prevent interference in the frequency band 406-406.1 MHz

Enhanced Maritime communication systems

- New applications for data exchange, using Automatic Identification System (AIS) technology, are intended to improve the safety of navigation. To enable them, New allocations were made in the bands **161.9375-161.9625 MHz** and **161.9875-162.0125 MHz** to the maritime mobile-satellite service.

Note: *Studies will continue on the compatibility between maritime mobile-satellite service (MMSS) in the downlink in the band 161.7875-161.9375 MHz and incumbent services.*

Outcomes of WRC-15

Road Safety

- According to UN data, more than 1.25 million fatalities occur each year on the roads around the world.
- Radio-frequency spectrum needed for the operation of short-range high-resolution automotive radar has been allocated in the **79 GHz** band. This will provide a globally harmonized regulatory framework for automotive radar to prevent collisions and improve vehicular safety by reducing traffic accidents.

White spaces

- White space is still under discussion in ITU-R SG1, it was not subject of the conference.

Outcomes of WRC-15

Satellite Earth Stations in Motion

- WRC-15 agreed to facilitate the global deployment of Earth Stations In Motion (ESIM) in the **19.7 – 20.2 GHz** and **29.5 – 30.0 GHz** bands in the fixed-satellite service (FSS), paving the way for satellite systems to provide global broadband connectivity for the transportation community.
- Earth stations on-board moving platforms, such as ships, trains and aircraft, will be able to communicate with high power multiple spot beam satellites, allowing transmission rates in the order of **10 – 50 Mbits/s**.

Standard C Band (3.7GHz-4.2GHz)

- **NOC** it keeps its allocation to **FSS**

Outcomes of WRC-15

Wi-Fi

- ITU-R studies indicate that the minimum spectrum need for WAS/RLAN in the 5 GHz frequency range in the year 2018 is estimated at **880 MHz** (*includes 455-580 MHz already utilized by non-IMT mobile broadband applications operating within the 5 GHz range resulting in 300-425 MHz additional spectrum being required*)
- Res. COM6/22: *Studies concerning Wireless Access Systems including radio local area networks in the frequency bands between 5 150 MHz and 5 925 MHz*
- Invited the 2019 WRC to consider the results of the ITU-R studies and take appropriate actions

IMT and WRC-15

- **From Res. ITU-R 56-1 we know that IMT encompasses all its generations**
  - IMT-2000,
  - IMT-Advanced, *and now…*
  - IMT-2020

IMT and WRC-15

Related to IMT-2000:

- Technical Specifications are defined in Recommendation ITU-R M.1457, first release dated from May 2000: ITU-R M.1457-0 (05/2000), since then twelve revisions were made, and most recent version is: ITU-R M.1457-12 (02/2015)
- 6 Families of Technologies were recognized as IMT-2000 compliance

Related to IMT-Advanced:

- Technical Specifications are defined on Recommendation ITU-R M.2012, first release dated from 2012: ITU-R M.2012-0 (01/2012), since then two revisions were made, and most recent version is: ITU-R M.2012-2 (09/2015)
- 2 Families of Technologies were recognized as IMT-Advanced compliance

IMT 2020

- Since early 2012, ITU-R embarked on a programme to develop “IMT for 2020 and beyond”, setting the stage for ‘5G’ research activities emerging worldwide; involved parties have in mind a consensus about the “5G” Definitions and ”IMT-2020” Technical Specifications

- Roadmap for IMT-2020 has been defined on the recent Recommendation ITU-R M.2083-0 (09/2015) : IMT Vision - "Framework and overall objectives of the future development of IMT for 2020 and beyond"

Recent ITU Outcomes related to IMT

- Recommendation **ITU-R M.1579-2** (03/2015): Global circulation of IMT-2000 terrestrial terminals

- Recommendation **ITU-R M.1036-5** (10/2015): Frequency arrangements for implementation of the terrestrial component of International Mobile Telecommunications (IMT) in the bands identified for IMT in the Radio Regulations (RR)

- Recommendation **ITU-R M.2012-2** (09/2015): Detailed specifications of the terrestrial radio interfaces of International Mobile Tele communications Advanced (IMT-Advanced)

- Recommendation **ITU-R M.2083-0** (09/2015): Framework and overall objectives of the future development of IMT for 2020 and beyond
- Report ITU-R M.2370 (07/2015): IMT Traffic estimates for the years 2020 to 2030

- ITU-R Handbook on "**Global trends in IMT"** (05/2015)

- **ITU-R WP 5D**: Work plan, timeline, process and deliverables for the future development of IMT

WRC-15 Outcomes related to IMT

➢ Revised Resolution related to IMT:

- **Resolution 212** (Rev.WRC-15): Implementation of International Mobile Telecommunications in the frequency bands 1 885-2 025 MHz and 2 110-2 200 MHz

- **Resolution 223** (Rev.WRC-15): Additional frequency bands identified for International Mobile Telecommunications

- **Resolution 224** (Rev.WRC-15): Frequency bands for the terrestrial component of International Mobile Telecommunications below 1 GHz

- **Recommendation 207** (Rev.WRC-15): Future IMT systems

WRC-15 Outcomes related to IMT

➢ New Resolutions related to IMT:

- **Resolution 235** (WRC-15): Review of the spectrum use of the frequency band 470-960 MHz in Region 1

- **Resolution 761** (WRC-15): Compatibility of International Mobile Telecommunications and broadcasting-satellite service (sound) in the frequency band 1 452-1 492 MHz in Regions 1 and 3

- **Resolution 238** (WRC-15): Studies on frequency-related matters for International Mobile Telecommunications identification including possible additional allocations to the mobile services on a primary basis in portion(s) of the frequency range between 24.25 and 86 GHz for the future development of International Mobile Telecommunications for 2020 and beyond

IMT Frequency Bands before WRC-15

As in WRC 12		
Band (MHz)	**Bandwitdh (MHz)**	**Radio Rules Footnotes identifying the band for IMT**
450-470	20	5.286AA
698-960	262	5.313A, 5.317A
1710-2025	315	5.384A, 5.388
2110-2200	90	5.388
2300-2400	100	5.384A
2500-2690	190	5.384A
3400-3600	200	5.430A, 5.432A, 5.432B, 5.433A
7 Bands	**Total 1,177**	

New IMT Frequency Bands in WRC-15

- **Following the growing demand for spectrum for mobile broadband services, WRC-15 identified frequency bands in the L-band (1427-1518 MHz) and in the lower part of the C-band (3.4 -3.6 MHz)**

- **WRC-15 took a key decision that will provide enhanced capacity for mobile broadband in the 694-790 MHz frequency band in ITU Region-1 and a globally harmonized solution for the implementation of the digital dividend.** *Full protection has been given to television broadcasting as well as to the aeronautical radio navigation systems operating in this frequency band.*

IMT and WRC-15

➢ Extended C Band (3.3GHz-3.7GHz)

- **3.3GHz – 3.4GHz**: new Band; Identification from some countries (into all Regions; it could be expected a global harmonization in WRC-23: as **same frequency band cannot be revised in consecutive conferences**)

- **3.4GHz – 3.6GHz**: partially identified before WRC-15, now globally harmonized identification for IMT

- **3.6GHz – 3.7GHz**: new Band; only few countries in Region 2 (Americas) identified for IMT (quite unlikely a global allocation in WRC-23)

IMT and WRC-15

- **L-Band (1427MHz – 1518MHz) (all new Bands)**
  - 1427MHz – 1452MHz: *Global identification*
  - 1452MHz – 1492MHz: *fully for R2 and R3, partially for R1 (it could be expected a global harmonization in WRC-23)*
  - 1492MHz – 1518MHz: *Global identification*

New IMT Frequency Bands in WRC-15

WRC - 15				
Band (MHz)	Bandwitdh (MHz)	R1	R2	R3
470 – 608	138		some	
614 – 698	84		some	
1427 – 1452	25	any	any	any
1452 – 1492	40	some	any	any
1492 – 1518	26	any	any	any
3300 – 3400	100	some	some	some
3600 – 3700	100		some	
4800 – 4990	190		some	some
8 Bands	New BW 703			

Note: Table is based on provisional Final Acts and may change once final Acts are issued

All IMT Frequency Bands

Band (MHz)	Bandwidth (MHz)
450-470	20
470-608	138
614-698	84
698-960	262
1427-1452	25
1452-1492	40
1492-1518	26
1710-2025	315
2110-2200	90
2300-2400	100
2500-2690	190
3300-3400	100
3400-3600	200
3600-3700	100
4800-4990	190
15 Bands	1,880 (Regional allocations vary and therefore totals can be different for a specific region)

Note: Table is based on provisional Final Acts and may change once final Acts are issued

Conference Preparatory Meeting for WRC-19 (CPM19-1)

CPM19-1

- **Following the WRC-15 the CPM19 had its first meeting from 30 November – 1 December 2015. 269 participants from 63 Member States, 1 Observer from the State of Palestine and 25 Sector Members**

- **The main task of the CPM is to decide on the structure of the CPM Report (for the WRC-19 conference) and the chapter rapporteurs and allocate the work to the relevant study groups.**

Resolution COM 6/16 contains the proposed agenda items for the WRC-19 and also references to the relevant Resolutions which are calling for the appropriate studies.

CPM19-1

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CPM19-1

CHAPTER 1: *Land mobile and fixed services*

- Agenda items: 1.11, 1.12, 1.14, 1.15

  Rapporteur: Ms Keer ZHU (China (People's Republic of))

CHAPTER 2: *Broadband applications in the mobile service*

- Agenda items: 1.13, 1.16, 9.1 (issues 9.1.1, 9.1.5, 9.1.8)

  Rapporteur: Mr José ARIAS (Mexico)

CHAPTER 3: *Satellite services*

- Agenda items: 1.4, 1.5, 1.6, 7, 9.1 (issues 9.1.2, 9.1.3, 9.1.9)

  Rapporteur: Mr Nicolay VARLAMOV (Russian Federation)

CHAPTER 4: *Science services*

- Agenda items: 1.2, 1.3, 1.7

  Rapporteur: Mr Vicent MEENS (France)

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- **CHAPTER 5:** *Maritime, aeronautical and amateur services*
  - Agenda items: 1.1, 1.8, 1.9, 1.10, 9.1 (issue 9.1.4)

    Rapporteur: Mr Wael EL SAYED (Egypt (Arab Republic of))

- **CHAPTER 6:** *General issues*
  - Agenda items: 2, 4, 9.1 (issues 9.1.6, 9.1.7), 10

    Rapporteur: Mr Peter N. NGIGE (Kenya (Republic of))

I Thank U

"Committed to connecting the WORLD"

Major ITU SM Events in 2016

ITU Study Group Meetings
ITU-D (Res. 9) and ITU-R SG1

ITU COE training workshop on Spectrum Management and Monitoring
Chengdu, China 16 – 21 May 2016

Economic Aspects of Spectrum Management
Iran, Q3/4 2016

2nd Asia Pacific Spectrum Management Conference
Bangkok, Thailand 25-29 April 2016

Your active participation in and contribution to these events is most welcome!