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| **Telecommunication DevelopmentAdvisory Group (TDAG)****25th Meeting, Geneva, 2-5 June 2020** | C:\Users\comas\AppData\Local\Temp\Rar$DRa0.735\jpg\ITU official logo_blue_RGB.jpg |
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|  | **Document** **TDAG-20/****4-E** |
|  | **21 January 2020** |
|  | **Original:** **English** |
| Director, Telecommunication Development Bureau |
| OUTCOMES OF WRC-19, RA-19 AND CPM23-1 RELATED TO ITU-D |
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| **Summary:** The Radiocommunication Assembly 2019 (RA-19) took place in Sharm el-Sheikh, Egypt, from 21 to 25 October 2019. It was followed by the World Radiocommunication Conference 2019 (WRC-19) from 28 October to 22 November 2019 and the first session of the Conference Preparatory Meeting (CPM23-1) for the World Radiocommunication Conference 2023 (WRC-23) from 25 to 26 November 2019. WRC-19 addressed topics related to frequency allocation, frequency sharing and the associated regulatory procedures for the efficient use of spectrum and orbital resources. This document summarizes the results of these meetings and highlights the relevant decisions which are important especially for developing countries.**Action required:** TDAGis invited to note this report and provide guidance as deemed appropriate. |

# Background

The Radiocommunication Assembly 2019 (RA-19) took place in Sharm el-Sheikh, Egypt, from 21 to 25 October 2019, followed by the World Radiocommunication Conference 2019 (WRC-19) from 28 October to 22 November 2019. Around 3400 participants from 163 countries participated in the conference, which received 568 documents and held 14 plenary meetings. Dr Amr Badawi of Egypt was appointed Chairman of WRC-19.

WRC-19 established the following seven committees and an ad hoc group of the Plenary to carry out its responsibilities:

* Committee 1: Steering Committee (composed of the chairman and vice-chairmen of the conference and the chairman and vice-chairmen of the committees)
* Committee 2: Credentials Committee (chaired by Mr Timofey Kim, Kazakhstan)
* Committee 3: Budget Control Committee (chaired by Mr Daniel Obam, Kenya)
* Committee 4: specific WRC-19 agenda items on terrestrial issues (chaired by Mr José Arias Franco, Mexico)
* Committee 5: specific WRC-19 agenda items on satellite issues (chaired by Mr Nobuyuki Kawai, Japan)
* Committee 6: specific WRC-19 agenda items on general issues and next WRCs (chaired by Mr Martin Weber, Germany)
* Committee 7: Editorial Committee (chaired by Mr Christian Rissone, France)
* Ad hoc group of the Plenary (chaired by Ms Cindy-Lee Cook, Canada).

The first session of the Conference Preparatory Meeting (CPM23-1) for WRC-23 took place from 25 to 26 November 2019. CPM has as its main task to decide on the structure of the draft CPM Report for WRC-23, the chapter rapporteurs, and to allocate the preparatory work for WRC-23 to the relevant ITU-R study groups or subordinate groups, as appropriate.

# RA-19

The resolutions approved by the Radiocommunication Assembly are available at <https://www.itu.int/md/R19-RA19-C-0077/en>.

RA-19 also decided on the structure of the ITU-R study groups and elected the chairmen and vice-chairmen of all the study groups (see Resolution ITU-R 4-7 on the Structure of Radiocommunication Study Groups at https://www.itu.int/pub/R-RES-R.4).

The Resolutions and Recommendations agreed during RA-19, which have special relevance to developing countries and the future work of BDT are listed below:

**Resolution ITU-R 7-4** **–** Telecommunication development including liaison and collaboration with the ITU Telecommunication Development Sector (<https://www.itu.int/pub/R-RES-R.7-4-2019>).

**Resolution ITU-R 9-6** **–** Liaison and collaboration with other relevant organizations, in particular ISO, IEC and CISPR (<https://www.itu.int/pub/R-RES-R.9-6-2019>).

RA-19 requested that: “This Resolution should be brought to the attention of the Telecommunication Standardization Sector and the Telecommunication Development Sector”.

**Resolution ITU-R 12-1** – Handbooks and special publications for development of radiocommunication services (<https://www.itu.int/pub/R-RES-R.12>).

This resolution was not modified and still invites “the Telecommunication Development Sector to indicate what special subjects would be most useful to developing countries so that planning for handbooks and special publications may be undertaken”.

**Resolution ITU-R 50-4** **–** Role of the Radiocommunication Sector in the ongoing development of IMT (<https://www.itu.int/pub/R-RES-R.50-4-2019>).

**Resolution ITU-R 66-1** **–** Studies related to wireless systems and applications for the development of the Internet of Things(<https://www.itu.int/pub/R-RES-R.66-1-2019>).

**Resolution ITU-R 69** **-1–** Development and deployment of international public telecommunications via satellite in developing countries(<https://www.itu.int/pub/R-RES-R.69-1-2019>).

**Resolution ITU-R 70** **–** Principles for the future development of broadcasting (<http://www.itu.int/pub/R-RES-R.70>).

**Resolution ITU-R 71 –** Role of the Radiocommunication Sector in the ongoing development of television, sound and multimedia broadcasting (<http://www.itu.int/pub/R-RES-R.71>).

**Recommendation ITU-R M.1036-6 –** Frequency arrangements for implementation of the terrestrial component of International Mobile Telecommunications (IMT) in the bands identified for IMT in the Radio Regulations (<http://www.itu.int/rec/R-REC-M.1036>).

**Recommendation ITU-R M.1174-4 –** Technical characteristics of equipment used for on-board vessel communications in the bands between 450 and 470 MHz
(<http://www.itu.int/rec/R-REC-M.1174>).

**Recommendation ITU-R M.2134-0 –** Receiver characteristics and protection criteria for systems in the mobile service in the frequency range 27.5-29.5 GHz for use in sharing and compatibility studies (<http://www.itu.int/rec/R-REC-M.2134>).

**Recommendation ITU-R M.2135-0 –** Technical characteristics of autonomous maritime radio devices operating in the frequency band 156-162.05 MHz
(<https://www.itu.int/rec/R-REC-M.2135/en>).

# Main results of WRC-19

WRC-19 addressed topics related to frequency allocation, frequency sharing and the associated regulatory procedures for the efficient use of spectrum and orbital resources. The outcomes ensure high-quality radiocommunication services for mobile and satellite communications, maritime and aeronautical transport, air and road safety as well as for scientific purposes related to the environment, meteorology and climatology, disaster prediction, mitigation and relief.

WRC-19 decided on new and revised spectrum allocations and regulatory procedures for different services such as IMT-2020 (otherwise known as 5G mobile), space research, Earth exploration-satellite services (EESS), large scale non-geostationary satellite constellations (some hundreds to thousands spacecraft), high-altitude platform stations (HAPS), RLANs (WiFi networks), railway radiocommunication systems between train and trackside (RSTT), intelligent transport systems (ITS) and the Global Maritime Distress and Safety System (GMDSS).

Other major outcomes are listed below.

* WRC-19 identified additional globally harmonized (millimeter wave) frequency bands (24.25– 27.5 GHz, 37–43.5 GHz, 45.5–47 GHz, 47.2–48.2 and 66–71 GHz) for International Mobile Telecommunications (IMT), including IMT‑2020 (5G mobile), facilitating diverse usage scenarios for enhanced mobile broadband, massive machine‑type communications and ultra-reliable and low‑latency communications.

*In total, WRC‑19 identified more than 8 times more spectrum for IMT than was identified for IMT before the conference. 17.25 GHz of spectrum was identified for IMT after the conference, in comparison with the 1.9 GHz of spectrum identified before WRC‑19. Out of this number, 14.75 GHz of spectrum has been harmonized worldwide, reaching 85 per cent of global harmonization.*

* Protections were accorded to the Earth exploration-satellite service (EESS) as well as meteorological and other passive services in adjacent bands, such as the space research service (SRS) to ensure that space‑based monitoring of the Earth and its atmosphere remain unhindered (limits were established on unwanted emissions for the total radiated power of IMT stations).
* Satellite services supporting meteorology and climatology that aim to safeguard human life and natural resources will be protected from harmful radio‑frequency interference, as will systems used by radio astronomers for deep space exploration. WRC‑19 protected operations of EESS (passive) in the 23.6–24 GHz by establishing limits on unwanted emissions for the total radiated power of IMT stations).
* Radio astronomy stations will be protected from any harmful radio interference from other space stations or satellite systems in orbit.
* New orbital slots were opened up for broadcasting satellites, providing developing countries with the opportunity to regain access to spectrum orbit resources thanks to a priority mechanism especially set for them.
* A stable regulatory framework was defined for non‑geostationary satellite orbit (non-GSO) systems based on a milestone process enabling mega constellations to rapidly come to fruition. This will ensure that more affordable means of connectivity can be offered to citizens of all countries.

*Mega constellations of satellites consisting of hundreds to thousands of spacecraft in low-Earth orbit are becoming a popular solution for global telecommunications, as well as remote sensing, space and upper atmosphere research, meteorology, astronomy, technology demonstration and education.*Earth stations in motion will enable connectivity in planes, ships, and trains.

* The provision of a truly global maritime distress and safety system was ensured and expanded.
* Additional frequency bands were identified for high altitude platform stations (HAPS) – radios on aerial platforms hovering in the stratosphere – to facilitate telecommunications within a wide coverage area below for affordable broadband access in rural and remote areas.
* Regulatory provisions were revised to accommodate both indoor and outdoor usage and the growth in demand for wireless access systems, including RLANs for end-user radio connections to public or private core networks, such as WiFi, while limiting their interference into existing satellite services.
* AResolution was approved on railway radiocommunication systems between train and trackside (RSTT) to facilitate the deployment of railway train and trackside systems to meet the needs of a high-speed railway environment in particular for train radio applications for improved railway traffic control, passenger safety and security for train operations.
* A new Recommendation was approved to integrate ICTs in evolving intelligent transport systems (ITS) to connect vehicles, improve traffic management and assist in safer driving.
* Measures were taken to ensure the continuous assistance and support for the timely implementation of new technologies, including 4G and 5G networks and services, in Palestine.

**Entry into force of the revised provisions of the Radio Regulations**

The revised provisions of the Radio Regulations will enter into force on 1 January 2021, unless otherwise indicated in **Article 59** (Entry into force and provisional application of the Radio Regulations) or in **Resolution 99** (Provisional application of certain provisions of the Radio Regulations as revised by WRC-19).

The Provisional Final Acts of WRC-19 can be found at
<https://www.itu.int/pub/R-ACT-WRC.13-2019/en>

**Agenda items for WRC-23 and WRC-27**

WRC-19 approved the WRC-23 agenda, and invited the ITU Council to finalize the agenda and arrange for the convening of WRC-23. WRC-19 also approved the preliminary agenda for WRC-27 which will be considered further at WRC-23.

**Agenda for WRC‑23**

1.1 **Aeronautical and maritime mobile services:** consider protection of stations located in inter‑ national airspace and waters from other stations located within national territories.

1.2 **International Mobile Telecommunications (IMT):** consider additional allocations to the mobile service and identification of frequency bands for IMT.

1.3 **Mobile service within Region 1:** consider additional primary allocation of the band 3600–3800 MHz.

1.4 **High altitude platform stations as IMT base stations (HIBS):** consider the use of HIBS in the mobile service in certain frequency bands already identified for IMT.

1.5 **Review the spectrum use and spectrum needs of existing services in the frequency band 470–960 MHz in Region 1:** consider possible regulatory actions in the frequency band 470– 694 MHz in Region 1.

1.6 **Sub‑orbital vehicles:** consider regulatory provisions to facilitate radiocommunications for sub‑orbital vehicles.

1.7 **Aeronautical mobile‑satellite (R) service (AMS(R)S):** consider a new allocation for both the Earth‑to‑space and space‑to‑Earth directions of aeronautical VHF communications.

1.8 **Unmanned aircraft systems:** accommodate the use of fixed‑satellite service (FSS) networks by control and non‑payload communications of unmanned aircraft systems.

1.9 **Digital technologies for commercial aviation safety‑of‑life applications:** consider appropriate regulatory actions and updates to accommodate these technologies in existing HF bands allocated to the aeronautical mobile (route) service.

1.10 **Aeronautical mobile service for the use of non‑safety aeronautical mobile applications:** consider possible new allocations for these services.

1.11 **Global Maritime Distress and Safety System:** consider regulatory actions for the modernization of these systems and the implementation of e‑navigation

1.12 **Earth exploration‑satellite (active) service for spaceborne radar sounders:** consider a possible new secondary allocation.

1.13 **Space research service:** consider a possible upgrade of the allocation of the frequency band 14.8‑15.35 GHz to these services.

1.14 **EESS (passive):** consider possible adjustments to ensure alignment with more up‑to‑date remote‑sensing observation requirements (231.5-252 GHz).

1.15 **Earth stations on aircraft and vessels communicating with geostationary space stations in the fixed satellite service:** consider global harmonization (12.75-13.25 GHz).

1.16 **Non‑GSO FSS earth stations in motion:** develop technical, operational and regulatory measures, to facilitate the use of space‑to‑Earth and Earth‑to‑space frequency bands.

1.17 **Inter-satellite links:** consider adding an inter‑satellite service allocation, where appropriate.

1.18 **Mobile‑satellite service:** consider spectrum needs and potential new allocations for future development of narrowband mobile‑satellite systems.

1.19 **Fixed‑satellite service in the space‑to‑Earth direction:** consider a new primary allocation for these services in Region 2 (17.3-17.7 GHz).

**Preliminary agenda for WRC‑27**

2.1 **Radiolocation service:** consider additional spectrum allocations and identification for radio‑ location applications for millimeter and sub‑millimeter wave imaging systems.

2.2 **Aeronautical and maritime earth stations in motion communicating with geostationary space stations in the fixed-satellite service:** develop technical, operational and regulatory measures to facilitate the use of the frequency bands by these stations.

2.3 **Fixed‑satellite service:** consider the allocation of frequency bands to this service.

2.4 **Article 21:** introduce pfd and e.i.r.p. limits for the frequency bands 71–76 GHz and 81–86 GHz.

2.5 **Satellite services:** define conditions for stations in the satellite service to ensure compatibility with passive services.

2.6 **Space weather sensors:** consider regulatory provisions for appropriate recognition and protection of these sensors.

2.7 **Non‑geostationary fixed satellite system feeder links:** consider the development of regulatory provisions for space‑to‑Earth and Earth‑to‑ space communications.

2.8 **Space‑to‑space links:** study the technical and operational matters, and regulatory provisions, among non‑geostationary and geostationary satellites operating in the mobile‑satellite service.

2.9 **Mobile service:** consider possible additional spectrum allocations to facilitate the future development of mobile‑service applications.

2.10 **VHF maritime:** consider improving the utilization of the frequencies in Appendix 18.

2.11 **EESS (Earth‑to‑space):** consider a new allocation for this service.

2.12 **IMT identification:** in frequency range 694-960 MHz consider the removal of the limitation regarding aeronautical mobile in the IMT for the use of IMT user equipment by non‑safety applications.

2.13 **Mobile-satellite service:** consider a possible worldwide allocation for the future development of narrowband mobile‑satellite systems in frequency bands in the range [1.5-5 GHz].

**Promoting gender equality**

WRC‑19 declared the commitment of the ITU Radiocommunication Sector to gender equality, and gender balance. In particular, it adopted a declaration on promoting gender equality, equity and parity in the work of ITU-R. According to this declaration, ITU Member States should urgently undertake active measures to increase the number of girls receiving primary and secondary education in mathematics and science that is sufficient to prepare them for undergraduate degrees in STEM fields.

The declaration also calls on Member States and Sector Members to increase substantially the number of scholarships and fellowships provided to women pursuing academic degrees at all levels in STEM fields, particularly in electrical engineering and computer science.

Member States, Sector Members and the Radiocommunication Bureau are to encourage ICT education for girls and women, and support all measures that will help prepare them for a professional career in ICT.

**Resolutions which call for actions from the Director of BDT or ITU-D**:

* Resolution 12 (Rev. WRC-19): Assistance and support to Palestine.
* Resolution 72 (Rev. WRC-19): World and regional preparations for world radiocommunication conferences
* Resolution 224 (Rev. WRC-19): Frequency bands for the terrestrial component of International Mobile Telecommunications below 1 GHz.
* Resolution 646 (Rev. WRC-19): Public protection and disaster relief.
* Resolution 647 (Rev. WRC-19): Radiocommunication aspects, including spectrum management guidelines, for early warning, disaster prediction, detection, mitigation and relief operations relating to emergencies and disasters.
* Resolution 760 (Rev. WRC-19): Provisions relating to the use of the frequency band 694-790 MHz in Region 1 by the mobile, except aeronautical mobile, service and by other services.

The [**Annex**](https://www.itu.int/md/D14-TDAG21-C-0002/en) to this document contains the Resolutions and Recommendations, which may be of special interest for developing countries**.**

# CPM23-1

The results of the first session of the Conference Preparatory Meeting (CPM 23-1) for WRC-23 are available in BR Administrative Circular **CA/251 of 19 December 2019** (<https://www.itu.int/md/R00-CA-CIR-0251/en>).

CPM23‑1 organized the preparatory studies for WRC‑23 and proposed a structure for the draft CPM Report to WRC‑23. Furthermore, the meeting nominated eight chapter rapporteurs and co-rapporteurs, who will assist the chairman in managing the development of the draft report to WRC‑23. With one exception, all the preparatory work, as agreed by CPM23‑1, will be performed within the framework of the foreseen work programme and organization of the ITU-R study groups. Exceptionally, ITU-R Study Group 6 is invited to establish a dedicated Task Group (TG 6/1) to deal with issues related to WRC‑23 agenda item 1.5.

The Conference Preparatory Meeting for WRC-23 is chaired by Ms Cindy-Lee Cook of Canada (see [List of CPM chairman and vice-chairmen](http://www.itu.int/online/compass/participants.sh?topic=CPM&head_title=List%20of%20Conference%20Preparatory%20Meeting%20Chairman%20and%20Vice-Chairmen)).

# Chapters and rapporteurs of the draft CPM Report to WRC-23

Chapter 1 Fixed, Mobile and Broadcasting issues

Agenda items: 1.1, 1.2, 1.3, 1.4, 1.5

Co-Rapporteur Dr Hiroyuki Atarashi (Japan), for agenda items 1.1, 1.2 and 1.4.

Co-Rapporteur Mr Usman Aliyu Mahmud (Nigeria), for agenda items 1.3 and 1.5.

**Chapter 2** **Aeronautical and maritime issues**

Agenda items: 1.6, 1.7, 1.8, 1.9, 1.10, 1.11

Rapporteur Mr Mohammed Alhassani (United Arab Emirates).

Chapter 3 Science issues

Agenda items: 1.12, 1.13, 1.14

Rapporteur Mr Tarcisio Aurélio Bakaus (Brazil).

Chapter 4 Satellite issues

Agenda items: 1.15, 1.16, 1.17, 1.18, 1.19, 7

Co-Rapporteur Ms Florence Magnier (France), for agenda items 1.15, 1.16, 1.17, 1.18, 1.19.

Co-Rapporteur Mr Georges Kwizera (Rwanda) for agenda item 7.

Chapter 5 General issues

Agenda items: 2, 4 and 9.1 topics a) Resolution **657 (Rev.WRC-19)**, b) Resolution **744 (WRC-19)**,
 c) Resolution **175 (WRC-19)**, and d) WRC-19 Doc. [535](https://www.itu.int/md/R16-WRC19-C-0535/en), 2nd section
 of the Annex

Co-Rapporteur Mr Jia Huang (China),

Co-Rapporteur Dr Jong Min Park (Republic of Korea)

**Annex**

**Resolutions and Recommendations, which may be of special interest for developing countries**

**Resolution 7 (Rev. WRC-19):** Development of national radio-frequency management.

**Resolution 12 (Rev. WRC-19):** Assistance and support to Palestine.

**Resolution 49 (Rev. WRC-19):** Administrative due diligence applicable to some satellite radiocommunication services.

**Resolution 72 (Rev. WRC-19):** World and regional preparations for world radiocommunication conferences.

**Resolution 223 (Rev. WRC-19):** Additional frequency bands identified for International Mobile Telecommunications.

**Resolution 224 (Rev. WRC-19):** Frequency bands for the terrestrial component of International Mobile Telecommunications below 1 GHz.

**Resolution 535 (Rev. WRC-19):** Information needed for the application of Article 12 of the Radio Regulations.

**Resolution 550 (Rev. WRC-19):** Information relating to the high-frequency broadcasting service.

**Resolution 646 (Rev. WRC-19):** Public protection and disaster relief.

**Resolution 647 (Rev. WRC-19):** Radiocommunication aspects, including spectrum management guidelines, for early warning, disaster prediction, detection, mitigation and relief operations relating to emergencies and disasters.

**Resolution 760: (Rev. WRC-19):** Provisions relating to the use of the frequency band 694-790 MHz in Region 1 by the mobile, except aeronautical mobile, service and by other services.

**Resolution 804 (Rev.WRC-19):** Principles for establishing agendas for world radiocommunication conferences.

**Resolution 240 [ex.COM4/2] (WRC-19):** Spectrum harmonization for railway radiocommunication systems between train and trackside within the existing mobile service allocations.

**Resolution 243 [ex.COM4/9] (WRC-19):** Terrestrial component of International Mobile Telecommunications within the frequency bands 37-43.5 GHz and 47.2-48.2 GHz.

**Resolution 244 [ex.COM4/10] (WRC-19):** International Mobile Telecommunications in the frequency band 45.5-47 GHz.

**Resolution 559 [ex.COM5/3] (WRC-19):** Additional temporary regulatory measures following the deletion of part of Annex 7 to Appendix 30 (Rev.WRC-15) by WRC-19.

**Resolution 32 [ex.COM5/5] (WRC-19):** Regulatory procedures for frequency assignments to non-geostationary-satellite networks or systems identified as short-duration mission not subject to the application of Section II of Article 9.

**Resolution 170 [ex.COM5/8] (WRC-19):** Additional measures for satellite networks in the fixed-satellite service in frequency bands subject to Appendix 30B for the enhancement of equitable access to these frequency bands.

**Resolution 811 [ex.COM6/1] (WRC-19):** Agenda for the 2023 world radiocommunication conference.

**Resolution 245 [ex.COM6/2] (WRC-19):** Studies on frequency-related matters for the terrestrial component of International Mobile Telecommunications identification in the frequency bands 3 300-3 400 MHz, 3 600-3 800 MHz, 6 425-7 025 MHz, 7 025-7 125 MHz, and 10.0-10.5 GHz.

**Resolution 172 [ex.COM6/12] (WRC-19):** Operation of earth stations on aircraft and vessels communicating with geostationary space stations in the fixed-satellite service in the frequency band 12.75-13.25 GHz (Earth-to-space).

**Resolution 175 [ex.COM6/18] (WRC-19):** Use of International Mobile Telecommunication systems for fixed wireless broadband in the frequency bands allocated to the fixed service on primary basis.

**Resolution 812 [ex.COM6/19] (WRC-19):** Preliminary agenda for the 2027 world radiocommunication conference.

**Recommendation 206 (Rev. WRC-19):** Studies on the possible use of integrated mobile-satellite service and ground component systems in the bands 1 525-1 544 MHz, 1 545-1 559 MHz, 1 626.5-1 645.5 MHz and 1 646.5-1 660.5 MHz.

**Recommendation 503 (Rev. WRC-19):** High-frequency broadcasting.

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