EACO WORKING GROUP-5 | POST WRC-19 WORKSHOP

Covid-19 Kills, Follow Your National C19 Task Force Guidelines

AGENDA

Key Outcomes of the World Radiocommunications Conference (WRC-19)

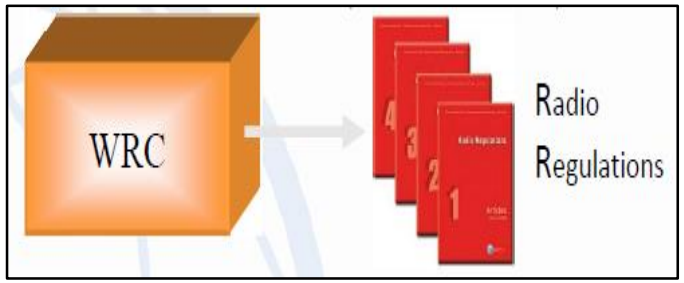
- Industry Partners and National Stakeholders
- Expected Course of Action by NRAs

WRC-19 Implementation Plan/Strategies at Regional and National Levels

CONTENT

1. General Overview
2. Key Topics Discussed at WRC-19
3. Identification of spectrum for IMT-2020
4. Protection of EESS and Meteorological Satellites
5. Identified additional spectrum for HAPS
6. New Regulatory Provision for Non-GSO Satellite Implementation
7. Earth Stations in Motion (ESIM)
8. Smart Transport Systems ITS and RSTT
9. WAS and RLAN (Outdoor Wi-Fi environment)
10. WRC-19 Declaration on Gender Equality
11. Summary of the Key Outcomes
12. High Level WRC-19 Outcomes Implementation Strategy

GENERAL OVERVIEW (1/4)



Radio Assembly (RA)

- A meet a week before WRC to agree on the structure and programme and approval of WRC studies.
- The duties and functions of the Radiocommunication Assembly are defined in Article 13 of the Constitution and Article 8 of the Convention

WRC (World Radiocommunications Conference)

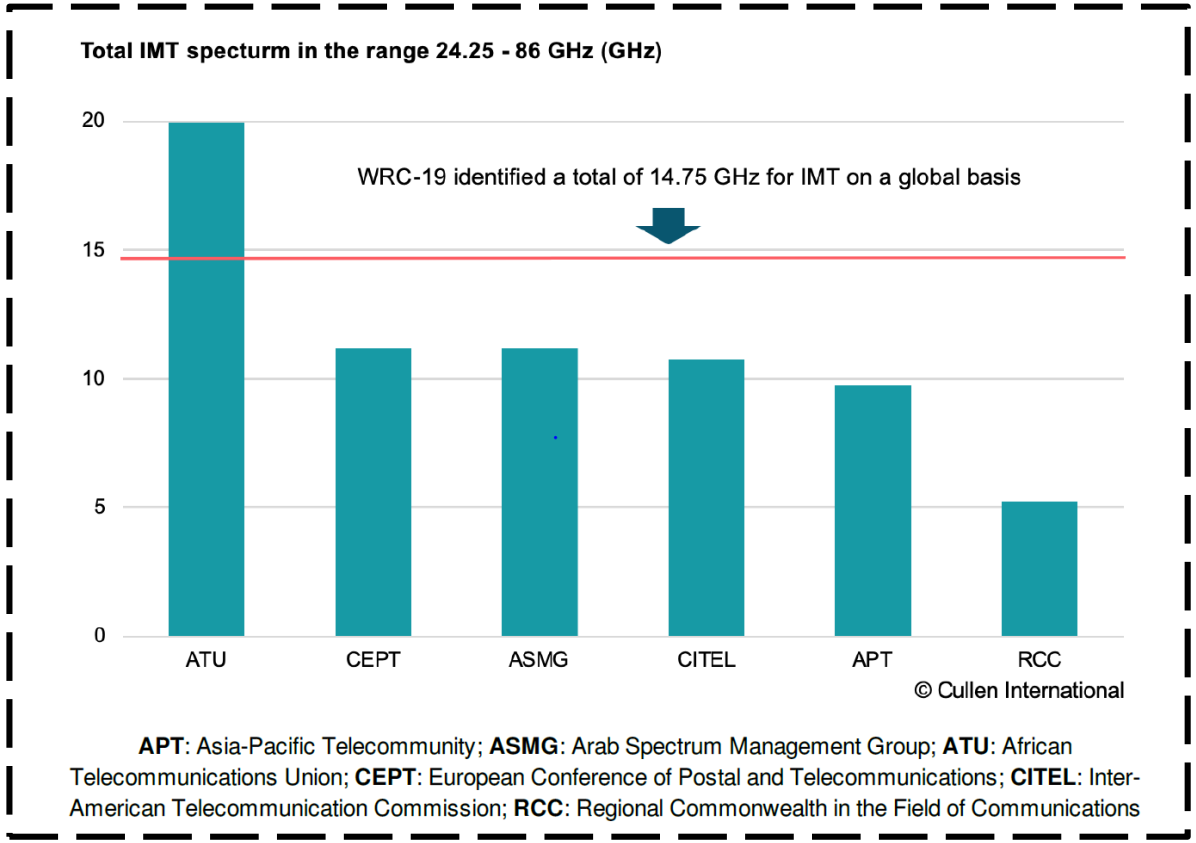
- Updates of radio regulations (RR); *Spectrum Allocations, Coordination & Notification Procedures, Administrative & Operations Procedures.*
- Adoption of new Resolution;
- Held every 3-4 years;
- Last WRC was held in 2019, in Egypt.

GENERAL OVERVIEW (2/4)

- WRC-19 identified more spectrum for IMT-2020 than what majority regional groups had proposed or hoped for;
- A total of **14.75GHz** of globally harmonised spectrum was identified for IMT-2020;
- In addition, identification by country or multi-countries from Americas, Middle-East, Europe and Africa added another **2.5GHz;**
- All identified spectrum is above **24GHz** (i.e. 24.25GHz to 86GHz) . Suitable for 5G technology that supports Active Antenna Systems (AAS).

GENERAL OVERVIEW (3/4)

- RCC, most conservative
- ATU, the most generous



APT: Asia-Pacific Telecommunity; **ASMG**: Arab Spectrum Management Group; **ATU**: African Telecommunications Union; **CEPT**: European Conference of Postal and Telecommunications; **CITEL**: Inter-American Telecommunication Commission; **RCC**: Regional Commonwealth in the Field of Communications

Source: Cullen International

GENERAL OVERVIEW (4/4)

WRC-19 Preliminary Regional Positions Vs. The WRC-19 Final Decision.

WRC-19: opening positions v. IMT identifications (Cullen International)

Spectrum band	Regional groups opening positions for IMT identifications *		WRC-19 decision
	Yes	No	
24.25–27.5 GHz	All		Global IMT identification
31.8–33.4 GHz		All	No IMT identification
37–40.5 GHz	APT, ATU and CITEL	ASMG	Global IMT identification
40.5–42.5 GHz	All		Global IMT identification
42.5–43.5 GHz	All except RCC	RCC	Global IMT identification
45.5–47 GHz		APT, ASMG, CITEL and RCC	Identified for IMT by 53 countries
47–47.2 GHz		All	No IMT identification
47.2–50.2 GHz	ATU CITEL (only for 47.2–48.2 GHz)	ASMG, CEPT and RCC	47.2–48.2 GHz Identified for IMT in region 2 and other 69 countries from region 1 and 3
50.4–52.6 GHz	ATU	ASMG, CEPT and RCC	No IMT identification
66–71 GHz	APT, ATU, ASMG and CEPT	CITEL and RCC	Global IMT identification
71–76 GHz	All except APT		No IMT identification
81–86 GHz	All except APT		No IMT identification

* excluding cases where the regional groups did not reach consensus regarding IMT identification in any of these bands or when the regional groups took a neutral position.

Source: Cullen International

KEY TOPICS DISCUSSED AT WRC-19

- IMT-2020, also known as 5G
- The Global Maritime Distress and Safety System (GMDSS)
- Earth Exploration and Meteorological-Satellite Systems
- Earth Stations in Motion (ESIM)
- Non-Geostationary Satellite Orbit (non-GSO) Systems
- High-Altitude Platform Station (HAPS) Systems
- Radiocommunication Systems between Train and Trackside for High-Speed Railway
- Communication over Wireless Access Systems, including Radio Local Area Networks (WiFi).

(1) IDENTIFIED SPECTRUM FOR IMT-2020 (1/10)

Additional bands identified for IMT-2020 **(COM4/7-10);**

24.25–27.5 GHz,
37–43.5 GHz,
45.5–47 GHz,
47.2–48.2 GHz, and
66–71 GHz.

- Additional spectrum was identified for IMT-2020, to facilitate and accelerate the deployment of 5G Mobile Network;
- 5G is expected to facilitate transportation of huge amount of data, at much faster rate and connection of large amount of devices;
- The ultra-low latency coupled with high bit-rate applications of IMT will require larger contiguous blocks of spectrum than those available in frequency bands that are currently in use or assigned by NRAs.
- Globally harmonised bands were desirable in order to facilitate global roaming and the benefits of economies of scales.
- In identifying the spectrum, WRC-19 took appropriate action to protect the EESS, including Meteorological and other passive services in adjacent bands.
- In total, identified spectrum was eight (8) times more spectrum that anticipated for IMT before the conference.
- 17.25GHz of spectrum was identified in comparison with the 1.9GHz identified before the conference.
- The good news is that 14.75GHz of the spectrum has been harmonised worldwide, bringing globally harmonised spectrum to 85% as of today.

(2) PROTECTION OF EESS AND METEOROLOGICAL SATELLITE SYSTEMS (2/10)

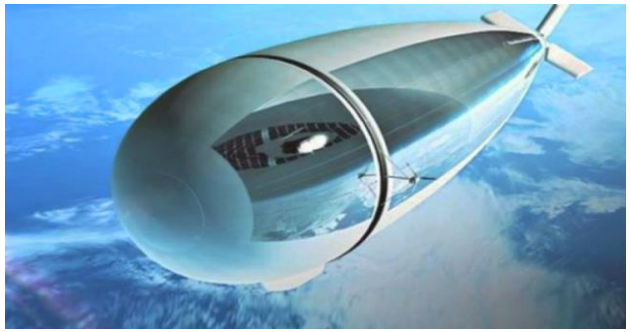
The limits are specified in **Resolution 750 (WRC-19)** and are implementable in two steps;

A limit of –33/–29 dBW/200 MHz applies for base/mobile stations brought into use before 1st September 2027.

A limit of –39/–35 dBW/200 MHz will apply for base/mobile stations brought into use after 1st September 2027.

- In identifying additional spectrum for IMT-2020, WRC-19 established conditions to protect incumbent services in or adjacent bands from IMT mobile base stations;
- Most notably, was the protection of EESS that helps in prediction of weather patterns and models. Harmful interference to the EESS would make weather predictions increasingly less accurate.
- WRC-19 established limits on unwanted emissions for the total radiated power (TRP) of IMT stations operating in the bands; 23.6-24GHz.
- The limits are specified in **Resolution 750 (WRC-19)** and are implementable in two steps; A limit of –33/–29 dBW/200 MHz applies for base/mobile stations brought into use before 1 September 2027. A limit of –39/–35 dBW/200 MHz will apply for base/mobile stations brought into use after 1 September 2027.
- The two steps implementation plan was key in breaking the deadlock for identifying the IMT in 26GHz (i.e. 24.25-27.5GHz) band.
- **Resolution Com4/8 (WRC-19)** requires that, the use of IMT in 24.25-27.5GHz ; allow for future development of EESS, SRS and FSS earth stations. Should be limited to land mobile (not Aircraft or Ships). Apply Category B limits **(Rec.ITU-R SM.329)** and keep the IMT BS antenna parterns/envelop within limits specified in **Rec.ITU-R M.2101(WRC-19)**
- **Resolution.Com4/9 (WRC-19)** protects EESS operating in the band 37-40.5GHz band from IMT base stations operating in the band 37-40.5GHz.

(3) ADDITIONAL SPECTRUM FOR HIGH ALTITUDE PLATFORM SYSTEMS (HAPS) (3/10)



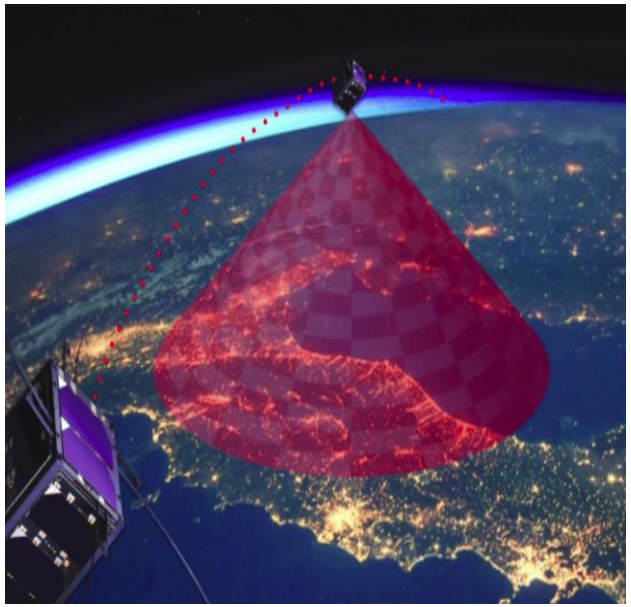
(1) The WRC-19 identified the frequency bands . **Resolutions 167 and 168 (WRC-19);**

- **31-31.3GHz (COM4/5)**
- **38-39.5GHz (COM4/6)**

(2) WRC-19 also re-affirmed that, the frequency bands **47.2-47.5GHz** and **47.9-48.2GHz** are available to administrations globally wishing to deploy HAPS.

- HAPS are high altitude platforms operating at heights above 20KMs from the ground surface (also known as the stratosphere);
- HAPS enhance broadband availability on a wide area basis than the terrestrial networks, thus connecting many people at the same time;
- HAPS could be deployed in times of disaster where ground infrastructure development is very difficult or not possible;
- HAPS could also be used for provision of fixed links to end users or backhaul links between the mobile access and the core networks;
- HAPS have been under trial for a number of years using both aircrafts and airships;
- The WRC-19 identified the frequency band 31-31.3GHz, 38-39.5GHz for global use by HAPS;
- WRC-19 also re-affirmed that, the frequency bands **47.2-47.5GHz** and **47.9-48.2GHz** are available to administrations globally wishing to deploy HAPS **(Resolution 122 (WRC-19).**

(4) NON-GEOSTATIONARY SATELLITE ORBIT (NON-GSO) SYSTEMS (4/10)



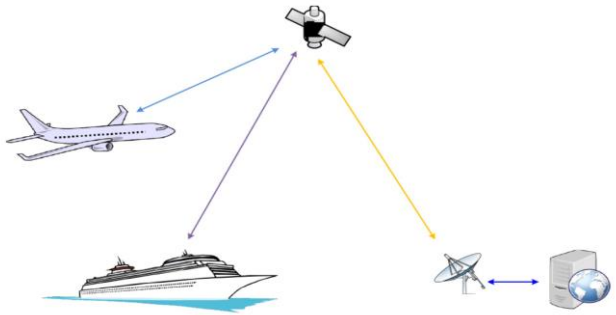
New Deployment Plan for NGSO effective 1st January 2021:

10% within the first two years;
50% within five years and
100% deployment at the end of the 7 years.

COM5/7 (WRC-19)

- A new regulatory procedure for the deployment of NGSOs including mega-constellation in the low-Earth orbit were established;
- With the new regulatory regime, NGSO systems shall deploy 10% of their constellations within 2 years after end of the current regulatory period for bring in into use, 50% within 5 years, and complete the deployment within 7 years.

(5) EARTH STATION IN MOTION (ESIM) (5/10)



Source: CEPT/ECC

Source: TVNZ

- A new resolution was adopted to boost the deployment of ESIM.
- WRC-19 recognise three types of ESIM; ESIM on aircraft (Aeronautical ESIM), ESIM on Ships (Maritime ESIM) and ESIM on vehicles (also known as land ESIM);
- ESIM are designed to connect people in aircraft, ships and vehicle to ensure their safety and security while in motion (remember MH370?);
- There has been increase in demand for spectrum for ESIM (ITU-R estimates over 20,000 vessels have been connected since 2014 and up to more than 50,000 vessels are projected for the next few years).
- WRC-19 adopted regulatory procedures for which the frequency bands **17.7-19.7GHz** (space-to-Earth) and **27.5-29.5GHz** (Earth-to-space) can be used by ESIM to communicate to GSO in the fixed satellite service (FSS) **(Resolution 169, COM5/6 (WRC-19).**
- While using the bands, ESIM deployment should NOT impose undue constraints on incumbent services (i.e. terrestrial and space services) or in any ways affect their future deployment.
- WRC0-19 also agreed that, it is important that this resolution be brought to the attention of the secretary-general of the International Maritime Organization and of the Secretary General of the International Civil Aviation Organization.

(6) SMART TRANSPORT SYSTEM: ITS AND RSTT (6A/10)

WRC-19 adopted:
COM4/2 WRC-19

- A new **recommendation** on intelligent transport system (ITS) and a **new Resolution** on railway radiocommunication systems between train and trackside (RSTT);
- This was aimed at facilitating improved transportation systems and road and train safety among others;

(6) SMART TRANSPORT SYSTEM: ITS AND RSTT (6B/10)

WRC-19 adopted:
COM4/2 WRC-19

ITS:

- The new ITU recommendation highlights the need for harmonization of frequency bands for evolving ITS applications under mobile service allocations;
- The recommendation also underscores the importance of harmonised spectrum and adoption of international standards to support the worldwide deployment of evolving ITS as well as to benefit from economies of scales,
- The recommendation further urges NRAs to consider using harmonised spectrum bands or parts thereof **(ITU-R M.2121)** in their attempts to plan and implement ITS applications in respective countries;
- The recommendation further invites ITU member states and sector members to actively contribute to the ITU-R studies on ITS and evolving ITS including but not exclusive to connected vehicles, autonomous vehicles, adaptive driver assistance systems through ITU-R study Groups.

(6) SMART TRANSPORT SYSTEM: ITS AND RSTT (6C-1/10)

RSTT:
COM4/2 (WRC-19)

RSTT:

- The new resolution underscore the social economic benefits of railway transportation, more so for developing countries like the EACO member states;
- It then calls for spectrum harmonization for railway radiocommunications systems between train and trackside (RSTT) within the mobile service allocation;
- RSTT is expected to improve railway traffic control, passenger safety and improved security for train operations;
- The main categories of RSTT applications include train radio, train positioning information, train remote and train surveillance.

(6) SMART TRANSPORT SYSTEM: ITS AND RSTT (6C-2/10)

RSTT:
COM4/2 WRC-19

RSTT Recommendations:

- The Resolution recognizes that ITU-R is developing a Recommendation to facilitate spectrum harmonization for current and evolving RSTT;
- NRAs are encouraged to take into account ITU-R study results and other deliverables with a view to facilitate spectrum harmonization for RSTT, in particular for train radio application;
- It further encourages railway agencies or organizations to utilize relevant ITU-R study results and publications when implementing technologies and systems supporting RSTT;
- Administrations may however determine the amount of spectrum to be made available for RSTT and conditions of usage at respective national or regional levels to meet a particular need.

(7) BSS ORBITAL SLOTS MADE AVAILABLE UNDER AI1.4 (7/10)

WRC-19 **Agenda Item 1.4;**

Resolution **559 [COM5/3] (WRC-19) ;**

- It will be recalled that the WRC-19 **Agenda Item 1.4** reviewed, and revised the limitations in **Annex 7** to **Appendix 30 (WRC-15**;
- Accordingly, orbital positions between **37.2° W** to **10°E** on the GSO arc, formerly referred to as forbidden GSO arc before WRC-19 were made available;
- **Resolution 559 [COM5/3] (WRC-19)** contains **"Special Procedure"** which gave priority access to certain administrations in ITU Region-1 & 3 to file for new assignment;
- Under ATU leadership and support from the BR, 31 African Member states including EACO countries successfully filed for new orbital positions and spectrum resources between 23rd March 2020 – 22nd May 2020;
- The race is on currently to request the RRB to not update our EPM values before the matter is discussed by WRC-23.

(8) WIRELESS ACCESS SYSTEMS AND RADIO LOCAL AREA NETWORKS (WIFI) (8/10)

WiFi networks;

WRC-19 Revised the Regulatory Provisions to;

- Accommodate both indoor and outdoor usage, and;
- Facilitate 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.

(9) GLOBAL MARITIME DISTRESS & SAFETY SYSTEM (GMDSS)(9/10)

WRC-19 Decision On **Issue A**:

- Expanded Coverage and Enhanced Capabilities for GMDSS;
- Supported **GMDSS** modernisation by including additional frequencies in the 415 – 526.5 kHz and 4 MHz – 27.5 MHz bands for NAVDAT system under maritime mobile service allocations;
- With its transmission limited to coast stations

(10) WRC-19 DECLARATION FOR GENDER EQUALITY (10/10)

WRC-19 Declaration:

- WRC-19 adopted a declaration that promotes gender equality, equity and parity in the work of the ITU Radiocommunication sector;
- ITU member states declared they will urgently undertake active measures to increase the number of girls receiving primary and secondary education in advanced mathematics and science in their preparation to undertake degree studies in STEM fields, including electrical engineering and computer science;
- The conference also agreed to increase the number of scholarship and fellowship provided to women pursuing academic degrees at all levels in STEM fields, and;
- By 2023, to substantially increase the number of internships, training opportunities and summer jobs available for women to prepare them for professional careers and leadership positions in the telecommunication/ICT sector;
- The conference accepted the independent state of Samoa's request to host Girls in ICT day 2020. This was scheduled to take place on 23rd April 2020.

SUMMERY OF THE KEY OUTCOMES (1/2)

1. Additional globally harmonised spectrum was identified for IMT-2020 to facilitate advanced mobile broadband and massive machine-type communications at ultra-low latency;
2. The Conference accorded protection to the EESS, Meteorological and SRS (space research services) in the adjacent bands;
3. Protection of Meteorological services and climatology that safeguards human life and natural resources as well as radio astronomical systems used for deep space exploration;
4. Protection of radio astronomy systems (RAS) from other space stations or satellite systems in orbit;
5. Resolution approved on Railway radiocommunication systems to facilitate the deployment of railway train and trackside systems to meet the needs of a high-speed railway environment;
6. New orbital slots were opened up for broadcasting satellite, to which priority access was given to developing countries to regain access to spectrum orbit resources with the view of replacing the severely degraded plans.

SUMMERY OF THE KEY OUTCOMES (2/2)

10. A milestone based regulatory approach was defined for non-geostationary satellite orbit (non-GSO) systems to facilitate faster implementation of satellite constellations;
11. ESIMs will enable connectivity in Planes, Ships and Trains;
12. Expansion of the global maritime distress and safety systems also referred to as GMDSS;
13. Approval of a new recommendation on Intelligent Transport Systems (ITS) aimed at connecting vehicles, improving traffic management and assisting safe driving;
14. Global Maritime Distress and Safety System (GMDSS) – Expanded coverage and enhanced capabilities for GMDSS;
15. WiFi networks – Regulatory provisions revised to accommodate both indoor and outdoor usage and the growth in demand for wireless access systems;
16. The conference unanimously declared its commitment of the sector to gender equality, and gender balance.

WRC-19 IMPLEMENTATION STRATEGY

A five (5) point implementation plan ;

- **Ratification of WRC-19 Final Act;** EACO member states should bring to the attention of respective ministries and recommend for ratification of the same;
- **National Table of Frequency Allocations (NFTA);** work should start on updating of NFTAs in line with decisions of WRC-19;
- **Stakeholder's Awareness;** all relevant stakeholders including industry agents at national levels, operators etc. should be informed of the outcomes and respective national policy on implementation;
- **Enabling Regulatory Environment;** NRAs are encouraged to start working relevant regulatory provisions/frameworks to facilitate smooth implementation of the outcomes;
- **Enabling Technical Environment;** work on regional spectrum harmonization and development of the relevant band plans should start.

REFERENCES

- WRC-19 Final ACTs;
- ITU News Magazine No. 6, 2019;
- Cullen International Publications

REMEMBER TO WASH YOUR HANDS VERY OFTEN, KEEP A PHYSICAL DISTANCE FROM ONE ANOTHER AND WEAR MASK WHEN IN PUBLIC

MUCHAS GRACIAS