

## ITU WRC-19 SPECTRUM POLICY PREVIEW

MICHAEL J. MARCUS

The International Telecommunication Union's (ITU's) World Radiocommunication Conference 2019 (WRC-19) will convene in Sharm el-Sheikh, Egypt, from 28 October to 22 November 2019. These conferences are held every three to four years. It is the job of WRC to review and, if necessary, revise the Radio Regulations [1], the international treaty governing the use of the radio-frequency spectrum and the geostationary-satellite and non-geostationary-satellite orbits. Revisions are made on the basis of an agenda determined by the ITU Council, which takes into account recommendations made by previous world radiocommunication conferences [2]. The WRC-19 agenda [3] includes about 25 items spanning a wide variety of radio services.

Although the Radio Regulations are a treaty obligation of ITU members, they are not mandatory for "military radio installations of (members') army, naval and air forces" [4]. In addition, ITU members may authorize other frequencies "on the express condition that harmful interference shall not be caused to services carried on by stations operating in accordance with the provisions of the Convention and of these Regulations" [5].

Thus, in services whose signals routinely cross national boundaries, including MF, HF, and all satellite services, these provisions are essential. They are also essential in countries with international land borders (unlike Japan and Sri Lanka) and in radio services that are intrinsically international in nature such as maritime and aeronautical mobile. Due to the mobility in today's information and communication technology-centric societies and economies, the provisions affecting mobile cellular telecommunications services, including ubiquitous smartphones, are extremely influential in today's telecommunications industry.

This column includes results from the 2nd ITU Inter-Regional Workshop on WRC-19 Preparation [6], held in Geneva on 20–22 November 2018, which narrowed the options to be considered on the various agenda items at WRC-19. The rest of this column will focus on a few agenda items likely to be of interest to readers of this publication. The references given will enable readers to find detailed information on all the agenda items for the conference. While it is generally too late now to start having a major influence on issues at the conference for those who have not been involved to date, understanding the cycles involved in preparation for such conferences and their national and international preparations is key to participating in future major ITU conferences.

Agenda Item (AI) 1.13 deals with identifying frequency bands for the future development of International Mobile Telecommunications (IMT). Twelve frequency bands have been identified for consideration in the range of 24.25–86 GHz. The bandwidths of the bands range from 1.6 GHz to 5 GHz, with the larger bands at the upper end of the range. For each of the possible bands, "methods" and "conditions" have been developed that enumerate the issues involving alternative arrangements in different ITU regions and with respect to other radio services. For example, there are possible interference issues with respect to passive environmental satellites as well as fixed satellite issues in several bands.

AI 9.1.1 deals with implementation of IMT in the frequency bands 1885–2025 MHz and 2110–2200 MHz, where there are coexistence and compatibility issues between the terrestrial and satellite components of IMT. Parts of these bands are now allocated on a coprimary basis to Mobile Service, Fixed Service, and Mobile Satellite Service, and there is concern about the compatibility of the terrestrial component of IMT and its satellite component in neighboring countries and adjacent geographical areas. Studies have now been completed on four different interservice

interference scenarios in two sub-bands. However, no consensus has yet been reached on policy options for the conference.

AI 1.12 deals with possible global or regional harmonized frequency bands for the implementation of intelligent transport systems (ITS) under existing mobile allocations. In this case, there are three options now under consideration. None of these involve a specific identification of bands for ITS, although two of the options encourage countries to seek harmonization on a regional or worldwide basis. The present options illustrate that during the multi-year conference preparation process, consensus can move away from ideas that were placed on the agenda at the previous conference.

AI 1.15 deals with future use of 275–450 GHz. This region has no present allocations, and none are under consideration at this time. However, there is present and planned use of the band "identified" for passive services [7], and the conference will consider balancing these with potential fixed and mobile uses. In addition to possibly maintaining the status quo ("NOC" in ITU jargon) [4], possible options are under consideration that differ in both procedure and substance with respect to use of various bands for mobile and fixed applications.

AI 1.16 deals with wireless access systems, including radio local area networks (WAS/RLAN), in the frequency bands between 5150 and 5925 MHz. The overall bandwidth is now being considered in five sub-bands. For three of these, no changes to existing allocations are now under consideration, but for the other two (5785–5850 and 5150–5250 MHz), possible changes to present allocations remain an option for the WRC.

There are many other issues under consideration for the conference ranging from amateur radio issues to railroad communications issues, so the examples above are really just a sample. Readers are advised that such spectrum policy issues need not be viewed as a "spectator sport," but are a legitimate part of communications engineering in the broad sense. Some engineers around the world make such issues the focus of their careers, but this need not be a binary choice. The author urges readers to become more knowledgeable in such issues and consider getting involved in their country's preparation for the next conference, which will be a few years after WRC-19. Participation in national-level ITU-R preparation is one way to start on such issues.

## REFERENCES

- [1] <https://www.itu.int/pub/R-REG-RR-2016>
- [2] <https://www.itu.int/en/ITU-R/conferences/wrc/Pages/default.aspx>
- [3] [https://www.itu.int/dms\\_pub/itu-r/oth/0c/0a/R0C0A00000C0027PDFE.pdf](https://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000C0027PDFE.pdf)
- [4] Article 48 of the International Telecommunication Constitution
- [5] ITU Radio Regulation 4.4
- [6] <https://www.itu.int/md/R15-2NDWRC19PREPWORK-C>
- [7] International Allocation Table Footnote 5.565

## BIOGRAPHY

Michael J. Marcus (mjmarcus@marcus-spectrum.com) (S '66, M '72, SM '01, F '04) is director of Marcus Spectrum Solutions, Cabin John, Maryland, and an adjunct professor at Virginia Tech's Bradley Department of Electrical and Computer Engineering. He retired from the Federal Communications Commission in 2004 after nearly 25 years in senior spectrum policy positions. While at FCC, he proposed and directed the policy developments that resulted in the bands used by Wi-Fi, Bluetooth, and licensed and unlicensed millimeter-wave systems above 59 GHz. He was an exchange visitor from FCC to the Japanese spectrum regulator (now MIC), and has been a consultant to the European Commission and the Singapore regulator (now IMDA). During 2012–2013 he was Chair of the IEEE-USA Committee on Communication Policy and is now its Vice Chair for Spectrum Policy. In 2013, he was awarded the IEEE ComSoc Award for Public Service in the Field of Telecommunications "for pioneering spectrum policy initiatives that created modern unlicensed spectrum bands for applications that have changed our world." He received S.B. and Sc.D. degrees in electrical engineering from MIT.