



King of the Hill in Spectrum ITU and WRC Set the Rules

Introduction

Earlier this year, the US announced that it has selected its leadership for the final preparations guiding its participation in the International Telecommunication Union (ITU) World Radiocommunication Conference 2023 (WRC-23) – the quadrennial gathering of radiocommunication authorities and subject matter experts from around the globe to harmonize the use of the electromagnetic spectrum both regionally and globally. The goal of the month-long conference is to amend and enhance the globally recognized road map governing the introduction of next-generation telecommunication technologies for the next 10-15 years and longer. As is the case with every WRC, the stakes are high as an ever-expanding list of spectrum-dependent technologies and applications vie for a finite supply of frequency resources.

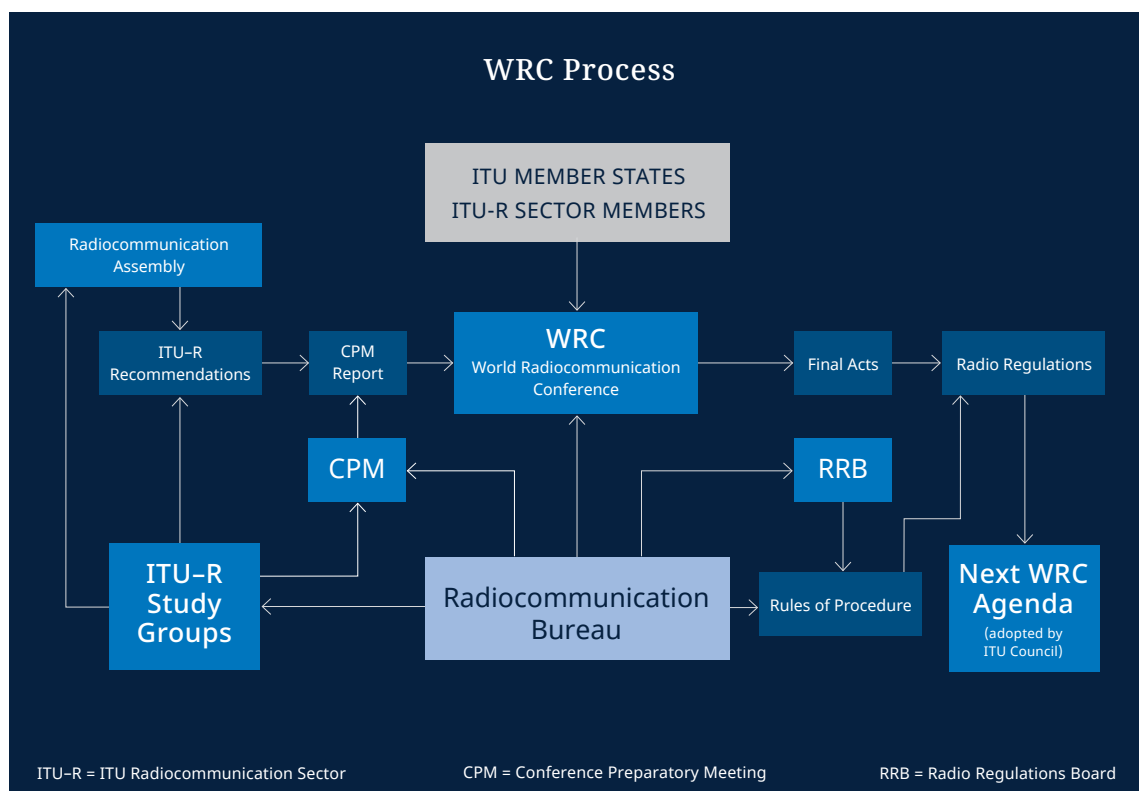
Founded in 1865, the ITU is the United Nations’ specialized agency for information and communications technologies. Every four years, the ITU brings together delegations from all 193 of its member states to convene in a month-long series of deliberations over a number of agenda items and topics affecting radio spectrum use. Each WRC is the cumulation of years of technical and regulatory studies, sometimes for more than one WRC cycle, that pave the way to the adoption of new Radio Regulations that govern the international use of spectrum. It is truly the king of the hill in spectrum management.

In late March, nearly 200 delegations from around the world will meet in Geneva to finalize the Conference Preparatory Meeting (CPM) Report for WRC-23. This report will be the first contribution to WRC-23 and contains different options, or in ITU-speak, methods, to change the Radio Regulations in response to the agenda set out by WRC-19. As discussed below, this agenda invites consideration of a wide array of spectrum and regulatory issues that impact technologies we use every day.



Overview of ITU and WRC

The ITU's primary role is to "allocate global radio spectrum and satellite orbits, develop the technical standards that ensure networks and technologies seamlessly interconnect, and strive to improve access to ICTs to underserved communities worldwide." There are three sectors within the ITU: Development, Standardization, and Radiocommunications. The Radiocommunications Sector (ITU-R) coordinates a vast and growing range of radio services as well as the international management of the radio-frequency spectrum. WRCs and their associated preparations fall under the purview of the ITU-R. The block diagram below, taken from the ITU's biennial World Radiocommunication Seminar, shows the inputs and outputs of the WRC process by the countries, preparatory meetings, and the invaluable support from the ITU's Radiocommunication Bureau.



The four-year cycle leading up to each World Radiocommunication Conference comprises a succession of technical studies and preparatory meetings. This graphic illustrates the cycle, the main parties and structures involved, and the steps taken ahead of the quadrennial conference. Source: ITU [Source: [WRS-22: Global harmonization paves road to WRC-23 – ITU Hub](#)]

Diversity and the ITU:

Despite its capabilities to influence industries and move markets, the arcane nature of its activities has resulted in the ITU operating largely in isolation within an insular environment. Indeed, several participants from the initial modern-era WRC, held in 1979, remain active in 2023. The ITU and its members have recognized that it needs to reach out to encourage a more diverse group of participants, especially women. To that end, the Network of Women for WRC-23 ([NOW4WRC23](#)) has been formed to promote gender equality, equity, and parity through [mentoring initiatives](#). For its part, the US has responded to the call by having women-led delegations at WRC-19 (Grace Koh) and at WRC-23 (Anna Gomez), and the US is not alone in expanding the number of women serving in leadership roles on country delegations. But, without doubt, the most significant action demonstrating that real change might be at hand is the election of Doreen Bogdan-Martin as the first woman ITU Secretary-General, with ultimate responsibility for the leadership and management of the ITU and its resources.

WRCs are an important opportunity to reflect on the current framework for international spectrum use and plot a course to consider future evolutions of radio services and their applications. The day-to-day workings of a WRC involve meetings from plenary down to informal drafting group sessions along with countless side discussions in the margins of the actual meetings. In the following section, we discuss the details of the upcoming WRC-23, its critical items, and ways to get involved in the WRC process.

The ITU is led by an elected Secretary-General. At the ITU [Plenipotentiary](#) Conference (Plenipot) in 2022, [Doreen Bogdan-Martin](#) became the first woman elected as Secretary-General in the ITU's 157-year history. The Secretary-General and her team are responsible for the leadership and management of the ITU and its resources. The Plenipot, held every four years, sets general policies and makes strategic and financial plans for the ITU, in addition to electing the ITU's senior management, the Member States of the Council, and the members of the Radio Regulations Board.

WRC-23 agenda items

Each WRC has its own unique set of issues and focus, and WRC-23 will be no different. Following WRC-19 at Sharm el-Sheikh, Egypt, WRC-23 will be the second conference held outside of Geneva. WRC-23 will take place in Dubai, United Arab Emirates from 20 November to 15 December 2023.

In general, WRC-23 agenda items (AIs) can be divided into five groups based on the different category of radio services they address, namely: (1) fixed and mobile, (2) aeronautical and maritime, (3) science, (4) satellite, and finally, (5) general issues. Each agenda item has an associated WRC Resolution that describes the current state of the Radio Regulations in a specific part of the radio spectrum and invite studies for a possible new or upgraded radio service to operate in that spectrum. At the beginning of the WRC-23 preparatory cycle, the agenda items were assigned to expert Study Groups responsible for carrying out studies. Study Groups are further subdivided into Working Parties that meet two to three times a year to study, discuss, and report their findings for each agenda item they were assigned. An agenda item will likely fail at the WRC if the corresponding studies are either incomplete or fail to achieve consensus support.

The full list of agenda items and their corresponding Resolutions are available in the ITU WRC-23 booklet. Those that have drawn the most attention are:

- **AI 1.1** – The 4.8-4.99 GHz frequency band was first identified for use within certain countries by International Mobile Telecommunications (IMT) at WRC-15 pursuant to a set of technical conditions. At WRC-19, the number of countries supporting IMT in the band expanded to 40. WRC-23 will review a key technical condition applicable to IMT services (i.e., the power-flux density limit) and other measures for co-existence with other services.

On paper, this is an agenda item with a narrow scope to study sharing conditions between IMT and aeronautical and maritime mobile services. In practice, however, complications have arisen due to Russia/China and NATO allies holding opposing opinions on this AI.

- **AI 1.2** – A number of frequency bands in what is known as “mid-band” spectrum are being considered for IMT identifications under this important AI, as identifying sufficient spectrum at global and regional levels is viewed as essential to expand 5G connectivity globally.

A large number of studies have been performed with the involvement of multiple ITU-R expert groups. It is expected that significant amount of effort will be spent on this AI leading to and at the WRC-23. Key considerations are the technical conditions that can enable IMT identification while protecting the incumbent services.

Frequency bands considered for IMT

- 3 600 to 3 800 MHz and 3 300 to 3 400 MHz (Region 2)
- 3 300 to 3 400 MHz (amend footnote in Region 1)
- 7 025 to 7 125 MHz (globally)
- 6 425 to 7 025 MHz (Region 1)
- 10 000 to 10 500 MHz (Region 2)



Radio Regulations No.1.66A – high altitude platform station:

A station located on an object at an altitude of 20 to 50 km and at a specified, nominal, fixed point relative to the Earth.

- **AI 1.4** – This AI studies the use of high-altitude platform stations as IMT base stations (HIBS) in the mobile service in certain frequency bands already identified for IMT. HIBS could provide coverage for remote or under-served area where traditional network infrastructure is impractical.

Concerns to be addressed under this AI include cross-border interference and whether there is any flexibility on the altitude of the platforms.

- **AI 1.16** – This AI will consider technical, operational, and regulatory measures to facilitate the use of non-geostationary satellite systems fixed-satellite service (FSS) earth station in motion a number of frequency bands.

A number of example provisions have been proposed to enable co-existence with incumbent services. One of the main topics of discussions is how to ensure compliance and manage interference response.

- **AI 1.17** – This AI aims to study the possibility of allowing satellite-to-satellite links in a number of current FSS frequency bands and determine the appropriate regulatory actions, including adding inter-satellite service (ISS) allocations where appropriate.

Studies under this AI were complicated by the number of possible configurations of satellite-to-satellite links between GSO and non-GSO satellites and the fact that satellite-to-satellite links can potentially be accommodated by FSS or ISS allocations.

- **AI 1.18** – AI 1.18 considers possible new allocation to the mobile-satellite service for narrow-band mobile-satellite service (MSS) systems in various frequency bands in Region 1 and/or Region 2.

This AI suffers from a lack of clarity to the maximum equivalent isotropically radiated power envisaged for the narrow-band MSS systems. As a result, studies were incomplete, and no change to the Radio Regulations at WRC-23 is expected. There has been suggestion of another agenda item based on a modified scope, but it remains to be seen whether there will be agreement at WRC-23.

A large part of the work that will be performed at WRC-23 includes the development of the agenda for WRC-27. Usually, by the end of the third week of the conference, future agenda items (FAIs) take the center stage in negotiations. What makes WRC-23 slightly different from previous conferences is the existence of a substantial [list of WRC-27 preliminary AIs](#). Many of the items were placed on this list during the final hours of WRC-19 deliberation when the conference was simply out of time for negotiation and out of available space for WRC-23 AIs. Proponents of these preliminary AIs will work hard at the conference to ensure their favorite items make the cut this time.

In addition to those already on the preliminary WRC-27 AI list, administrations and regions are expected to bring in additional proposals for FAIs. It is customary to include at least one agenda item from each regional group (see box) for the next conference. With six regional groups, one agenda item from each region plus the 13 existing preliminary WRC-27 AIs add up to 19 potential WRC-27 AIs. Some of the items on the current preliminary list will no doubt be cut to make room for new proposals, but one can expect fierce debate over valued places on the Resolution for WRC-27 AIs.

Getting involved

The best way to influence the outcome of a WRC is to participate in the process, early and often. The WRC preparatory process is long and intense, with many incremental steps between the closing ceremony of the previous WRC to the opening ceremony of the next one. From submission of technical characteristics, development of study methodologies, liaising between responsible and contributing groups, defending and examining sharing studies, to the deliberation of the CPM text, many hours are spent under the basement of the [Tower Building](#). While politics and diplomacy are also factors at WRCs, it is extremely difficult for any position to prevail without a solid foundation of work to support such a position.

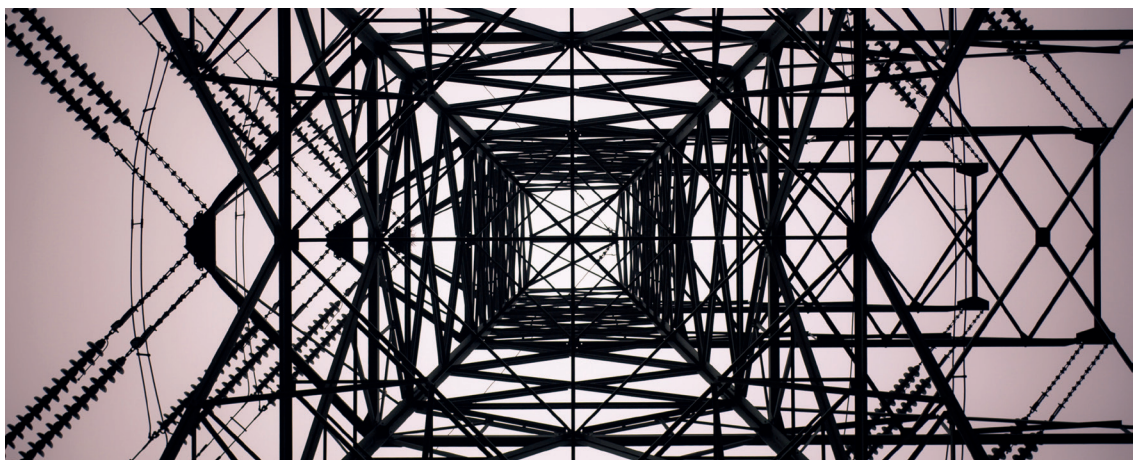
During a WRC cycle, the real works of developing the method(s) to satisfy each AI are performed by the responsible ITU-R Study Group and its affiliated Working Parties. As previously mentioned, these working parties meet two to three times a year to carry out the studies. As an example, AIs related to satellite services would belong to Study Group 4 and WP4A (FSS) or WP4C (MSS). It is critical to actively participate at the working party level to advocate for any issue of interests to you because outputs from the working parties feed directly into the deliberations at higher-level bodies, such as CPM and WRC.

Parallel to the ITU-R preparatory process, there are six regional groups for regional preparations of WRC. These regional groups play significant roles during

negotiations at the conference as a regional position carry much more weight than the position of a single administration. The United States participates in the Inter-American Telecommunication Commission (CITEL) and always works diligently to establish Inter-American Proposals, which require support from six or more CITEL member states with no more than half of that number of member states objecting.

The most immediate item in the horizon is the [CPM23-2](#). According to Resolution ITU-R 2-8, CPM23-2 “shall prepare a consolidated report to be used in support of the work of WRC.” And CPM23-2, chaired by Cindy-Lee Cook from Canada, will do just that in less than two weeks’ time at the end of March in Geneva. It will be a monumental effort to prepare and agree to (for most parts) a CPM report that will be nearly one thousand pages, as the draft CPM report going into the CPM23-2 currently stands at [948 pages](#). The final CPM report must be available five months prior to each WRC.

One might wonder how useful all these texts are in the CPM report? And the answer will be: it depends. For many WRC participants who have not been following the preparation through the entire cycle, the CPM report provides insight on the studies that have been done and the methods that are available for each WRC AI. For others, especially those who have been directly involved in the studies at lower level or for administrations with sophisticated national processes, the CPM report merely serves as a milepost on the way WRC.



Conclusion

WRC is not a zero-sum game. We are entering the age of sharing as exclusive spectrum access by a radio service is increasingly difficult to justify. At the end of a WRC, no one will get everything he or she has wanted, but most participants will get something that they need. Everyone who is on a national delegation will be there to represent the country instead of personal or institutional interests. Anyone who has been on a US delegation can attest that, despite the various interests and views, the US delegation always come together at WRC to achieve what the country needs.

Preparing for a WRC, participating in the study cycle, and finding the best approach to accomplish your spectrum objectives can be quite challenging. Established players and new entrants alike will require significant guidance on how to navigate through the domestic and international processes. DLA Piper's highly experienced Engineering Services team leverages the firm's global reach to provide WRC advocacy that are backed by engineering analysis and a deep understanding of the ITU-R and WRC. The team's experience and capabilities have helped many companies navigate these and other novel, complex issues.

For more information

Find out more about our firm at dlapiper.com. To learn more about DLA Piper's Telecommunications Engineering Services, download this concise document or contact any of the authors of this handbook:

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