Insight

# Primer: World Radio Conference 2023

JEFFREY WESTLING | JUNE 22, 2023

**Executive Summary**

- The World Radiocommunication Conference 2023, set to convene in November, determines the regulatory approach to a wide range of international telecommunications issues such as spectrum allocation for mobile wireless networks and next-generation satellite broadband deployment.
- Failure to advance U.S. interests on these issues at the conference could allow the Chinese Communist Party to advantage its own firms such as Huawei and ZTE, both of which have been banned in the United States due to security concerns.
- This primer explains what the World Radio Conference is, the important issues the conference will cover, and why strong leadership at the conference is critical to advancing U.S. interests in international telecommunications policy.

**Introduction**

In November, delegations from countries across the globe will meet in Dubai for the World Radio Conference 2023 (WRC-23). The conference allows delegations to propose changes to international radio regulations and plays a major role in the development and deployment of new radio equipment and standards. With a wide range of issues on the agenda, it will be critical for the U.S. delegation to find consensus on contentious issues and promote the interests of both commercial and government radio operations in the United States.

The conference will also set the agenda for the next World Radio Conference in 2027. As the conference occurs only every four years, participants must carefully consider the future of radio operations and the regulations that will allow for innovation and growth in the sector. As mobile wireless 6G networks, low Earth orbit (LEO) satellite constellations, and next-generation unlicensed standards all will see major developments in the coming years and require additional allocations and regulations to facilitate their deployment, developing a comprehensive agenda can make or break future innovation and determine which countries will lead.

These issues do not exist in isolation, and failure to move on key priorities will open the door for foreign rivals such as China to take the lead on technological deployment across the globe. For example, China has moved quickly to craft international standards using its 5G frequency bands, giving Chinese firms a leg up on international rivals. Without strong U.S. leadership, equipment from companies such as Huawei and ZTE could become the international standard as countries harmonize around Chinese technology.

This primer explains what WRC-23 is, its process, and the importance of making a strong case for U.S. interests. This primer also breaks down agenda items that lack consensus among U.S. agencies, firms, and experts, such as mid-band spectrum availability, future studies for high frequency spectrum bands, and satellite spectrum sharing and orbital plane standards. Congress can play a critical role in resolving outstanding disagreements and assisting the U.S. delegation in presenting a strong path forward for the conference.

## WRC-23

The World Radio Conference is a quadrennial meeting of radio regulators, industry representatives, and academics to determine international radio regulation standards. While countries need not necessarily follow the exact international radio regulations within their borders, these international rules allow for widespread harmonization of regulations and prevent countries from allowing services that would interfere with international allocations.

Delegations only address items on the conference agenda, and currently WRC-23 has 19 items. These issues range from spectrum allocations for wireless technologies in mid-band frequencies to rules for satellite operations. Of note, delegations will also set the agenda for the 2027 conference, and so will need to develop a long-term plan for WRC-27.

Prior to the conference, regional delegations will meet to discuss differing views on agenda items and priorities for WRC-27. These regional conferences allow the delegations to resolve disagreements and develop a strong coalition moving into the conference. Without regional support, proposals are not likely to receive broader support during the main conference. While initial meetings occurred in late May, the Americas region will meet again in Ottawa prior to WRC-23. This will be the last major chance to find agreement on outstanding issues and develop a plan for WRC-27 prior to the conference.

## Mobile Spectrum Allocation

### *Lower Mid-band Spectrum*

The WRC-23 agenda includes an item about potential 5G operations in mid-band spectrum, though developing a spectrum pipeline has been a contentious issue in recent years.

For current 5G networks, mid-band radio frequencies (ranging from about 1 GHz–6 GHz) provide a balance between capacity and coverage. While operations in these ranges can’t provide coverage as far as lower frequency bands, operations in the mid-band can cover enough geographic range to provide ubiquitous connection in cities and rural communities. Unlike lower band frequencies, these mid-band operations also allow for lower latency and higher bandwidth, making them perfect for 5G services.

In the United States, federal operations largely occupy these mid-band frequencies, making it difficult to find bands suitable for reallocation to either exclusive or shared-use licensing regimes. Thus far, the Federal Communications Commission (FCC) has made available for exclusive use the 3.7–4.2 GHz band, though deployment has faced challenges due to potential interference with radio altimeters on aircraft and the 2.5 GHz band, although the FCC hasn't issued all the licenses due to concerns that the lapse of spectrum auction authority prevents it from doing so. The 3.5 GHz band has been made available on a shared basis, with military operations taking top priority, a licensed tier that can operate when the military is not present, and an unlicensed underlay when neither the military nor licensed operators are operating in the band.

The need for mid-band spectrum among competing interests has spurred significant debate on the Hill and within regulatory agencies. Government and commercial wireless providers disagree over how much bandwidth should be allocated to federal agencies such as the Department of Defense (DoD), which uses mid-band spectrum for radar and communications platforms important to the nation's security. Different commercial operators also have conflicting goals and visions for mid-band spectrum, as large mobile providers such as AT&T, Verizon, and T-Mobile tend to support large, full power exclusive use licenses to build out nationwide networks. Newer entrants and cable providers want smaller licenses or shared regimes such as the 3.5 GHz band, which would provide these firms a better chance to obtain a license at auction or allow unlicensed operations in these bands for services such as Wi-Fi and Bluetooth. These disagreements, primarily between the DoD and commercial operators, largely caused the lapse of spectrum auction authority in early 2023, as a spectrum pipeline for 5G bands is negotiated. Congress should reauthorize the FCC's authority before the conference to give the delegation more credibility when negotiating with other countries.

Earlier this year, federal agencies agreed with a plan to include 100 MHz of mid-band spectrum for 5G allocations at WRC-23, though the DoD argues that this agreement will not prevent the agencies from continuing to study the feasibility of the 5G operations in the band in the United States on a shared basis rather than exclusive use for 5G networks. Besides that, no agreement has been reached on mid-band designations for 5G services.

These discussions do not exist in isolation. China will largely be pushing for international harmonization of the 6 GHz band for 5G services, a band the United States has allocated for unlicensed use. If the United States doesn't present alternative frequency ranges for 5G services that can be internationally harmonized, 5G operations in the 6 GHz band could be adopted in more regions. This would allow Chinese equipment to proliferate in regions where the plan is adopted, setting back efforts to make Wi-Fi 6 in the band an international standard.

*Upper Mid-Band Spectrum Allocation*

While WRC-23 focuses primarily on allocations for 5G networks, telecommunications companies must look ahead for spectrum bands suitable for 6G and unlicensed services in the 7 GHz–15 GHz range. Because WRC-23 will set the agenda for WRC-27, interested parties are working to develop an agenda item that would explore additional frequency bands that can be allocated internationally. At the same time, an allocation for 5G or 6G services could preclude other uses of the spectrum bands, or disincentivize countries from adopting shared regimes because the designation would essentially assign those bands for exclusive use licenses.

These issues, while seemingly a bit premature, are at the core of future spectrum discussions. Without a robust pipeline for 5G and 6G networks, the United States could fall behind international rivals including China in mobile deployment and standard setting. At the same time, there are valuable use cases for unlicensed or shared models in which parties maximize the efficiency of any given assignment. Exploring opportunities to make

additional bandwidth available while ensuring regulators have the flexibility to design band plans suitable for the particular band will be critical for future radio operations.

**Satellite Issues**

As companies deploy new technologies to provide broadband services, outdated or ineffective regulations could jeopardize future innovation and competition. Apart from the discussion about specific spectrum allocations, delegations will also debate the merits of a variety of satellite-related provisions at WRC-23. Because satellites operate outside the physical borders of nations, international coordination allows countries to ensure their operations remain unaffected as new systems enter service. Satellite operations provide a variety of different services, and the WRC allows parties to coordinate operations to prevent harmful interference. Innovations in LEO technology have seen tremendous growth in competitive broadband offerings at relatively low latency, but these systems often deploy a large constellation of satellites and need additional spectrum to provide competitive broadband services. Many of these issues will be debated at WRC-23.

Primarily, delegations will debate future study of updated sharing rules for satellite broadband operations in what is known as the Ka and Ku bands. These bands are critical for satellite communications but haven't been updated in over 25 years. LEO providers such as Space X and Kuiper have been pushing for an update to these rules, which would allow new entrants to operate in these bands while protecting incumbent systems. The legacy services, however, worry that updates to the sharing rules would cause harmful interference and disrupt their operations. This tension, if unresolved, could limit the development and deployment of new services.

Beyond spectrum allocation, WRC-23 will cover other critical issues related to satellite operations. For example, one agenda item is satellite orbit plane deviation. When a governing body approves a satellite deployment, it outlines the orbit of that satellite so neighboring systems know where it is positioned and can avoid collisions and harmful interference. Incumbent operators want the orbital plane to be fairly large, allowing for flexibility and adjustments when potential collisions may occur. New entrants, however, want the orbital plane to be relatively more confined so that their risk of interfering with the incumbent is diminished and their own network will have more flexibility. These types of orbital planning decisions determine whether constellations can coexist, and finding a balance between the competing interests will be critical for the deployment of next-generation LEO satellite broadband.

**Conclusion**

WRC-23 will cover a wide range of important issues related to telecommunications policy. Without strong U.S. leadership to set standards critical to innovation, international rivals could surpass the United States with their own preferred companies, such as Huawei and ZTE, which European clients may then prefer over Western firms. It will be critical for the U.S. delegation to find consensus for its positions and persuade international allies to adopt these policies.