

3-2004

Why the World Radiocommunication Conference Continues to be Relevant Today

Kathleen Q. Abernathy
Federal Communications Commission

Follow this and additional works at: <https://www.repository.law.indiana.edu/fclj>



Part of the [Administrative Law Commons](#), and the [Communications Law Commons](#)

Recommended Citation

Abernathy, Kathleen Q. (2004) "Why the World Radiocommunication Conference Continues to be Relevant Today," *Federal Communications Law Journal*: Vol. 56 : Iss. 2 , Article 2.

Available at: <https://www.repository.law.indiana.edu/fclj/vol56/iss2/2>

This Article is brought to you for free and open access by the Law School Journals at Digital Repository @ Maurer Law. It has been accepted for inclusion in Federal Communications Law Journal by an authorized editor of Digital Repository @ Maurer Law. For more information, please contact rvaughan@indiana.edu.



JEROME HALL LAW LIBRARY

INDIANA UNIVERSITY
Maurer School of Law
Bloomington

Why the World Radiocommunication Conference Continues to be Relevant Today

Kathleen Q. Abernathy*

I.	INTRODUCTION	287
II.	WHAT IS THE WRC?	288
III.	WHY IS THE WRC RELEVANT TODAY?	291
	A. <i>Harmonization of Spectrum</i>	291
	B. <i>Creating Technical and Operational Certainty</i>	296
IV.	CONCLUSION.....	298

I. INTRODUCTION

The World Radiocommunication Conference (“WRC” or “Conference”) is held every three to four years to ensure that on a global and regional basis the radiocommunications spectrum resource is used

* Kathleen Q. Abernathy was sworn in as a Commissioner of the Federal Communications Commission (“FCC”) on May 31, 2001. Before her appointment to the FCC, Commissioner Abernathy was Vice President for Government Affairs at Broadband Office, Inc.; a partner at Wilkinson Barker Knauer, LLP; Vice President for Regulatory Affairs at U.S. WEST (now known as Qwest Communications); Vice President for Federal Regulatory Affairs at AirTouch Communications and a Director at Comsat World Systems. She also served as a Legal Advisor to FCC Commissioners Sherrie Marshall and James Quello. Commissioner Abernathy received a B.S. from Marquette University and a J.D. from Columbus School of Law, the Catholic University of America. She is a member and former President of the Federal Communications Bar Association and a member of the Washington, D.C. Bar. Commissioner Abernathy served as a Senior Advisor to the United States’ delegation to the 2003 World Radiocommunication Conference.

Commissioner Abernathy wishes to thank Jennifer A. Manner and Anna-Elisa Mackowiak for their assistance with this article.

efficiently, that new radiocommunications services can be deployed, and that existing radiocommunications services are protected from harmful interference. At this year's Conference in Geneva, Switzerland, spectrum was allocated to further the deployment of many exciting uses of the radiocommunications spectrum, including wireless access ("wi-fi") services,¹ broadband wireless services on airplanes and ships, and additional data services over satellites.

Despite the accomplishments of past WRCs, some have argued that the WRC process is outdated and slow, and that it should be phased out. While improvements certainly can be made to further streamline the WRC process, the WRC remains an integral part of the world's ability to use the radiocommunications spectrum resource as efficiently as possible and to ensure the deployment of new and innovative services to consumers. In particular, the WRC is extremely important in accomplishing two critical goals in managing the radiocommunications spectrum on a global basis. First, the WRC provides an international forum to maximize the global harmonization of the radiocommunications spectrum resource. Second, the WRC decision-making process creates technical and operational certainty for new and existing users. These two components often overlap. This article examines why these two critical functions, in addition to the traditional WRC functions of spectrum allocation and protection of existing radiocommunications services, ensure that the WRC process is essential for sound global spectrum management into the twenty-first century.

II. WHAT IS THE WRC?

The WRC process is a tremendous undertaking to arrive at a consensus on a wide range of spectrum-related issues. Each WRC is attended by as many as 170 countries and must conclude in a four-week period of time. The WRC is one of the key activities of the International Telecommunications Union ("ITU"). The ITU is an international treaty-based organization that is affiliated with the United Nations. Its mission is to bring together the world's countries to coordinate global telecommunications networks and services.² The ITU is comprised of three

1. Wi-fi, or "Wireless fidelity," is the popular term for a wireless local area network ("WLAN") that replaces the use of physical cables for the connection of telecommunications networks within a building and in short distance outdoor areas to provide data and other services. WLANs have been deployed widely on college campuses and in certain business environments, such as cafes, throughout North America and Europe, and increasingly in developing countries.

2. See ITU, ITU Overview—Purposes, at <http://www.itu.int/aboutitu/overview/purposes.html> (last updated Feb. 13, 2002).

sectors: the Radiocommunications Sector (“ITU-R”),³ the Telecommunications Standardization Sector (“ITU-T”),⁴ and the Telecommunications Development Sector (“ITU-D”).⁵

WRCs are held under the auspices of the ITU-R. The main role of the ITU-R is to help manage the world’s radio frequency spectrum and satellite orbits. A major part of this task is to administer the ITU’s Radio Regulations, which is a treaty document that includes the International Table of Frequency Allocations and accompanying technical rules. As part of this process, WRCs are held every three to four years to examine and adopt appropriate changes to the Radio Regulations. Specifically, each Conference is able to (1) adopt changes that allocate spectrum for deployment of new services, (2) protect existing services from harmful interference, and (3) adopt accompanying technical rules.⁶

Since not all spectrum-related issues can be addressed at each Conference, every WRC follows an established agenda which is finalized at the prior WRC. The agenda for upcoming Conferences is often one of the most controversial items discussed at the WRC. Member states often have very strong views on what items should be considered and what items should not be considered at each future Conference. This controversy stems from the fact that failure to have an issue addressed at an upcoming Conference may lead to the delay or inability to launch a new service or use that is important for a particular country or region. Similarly, by allowing the consideration of an issue on a WRC agenda, a country or region may be concerned about the potential for harmful interference of a new service with an existing service. In some cases, competitive concerns may also drive support for or against an item.

3. See ITU, ITU Radiocommunication Sector, at <http://www.itu.int/ITU-R/> (last updated Mar. 25, 2004).

4. The mission of the ITU-T is “to ensure an efficient and on-time production of high-quality standards . . . covering all fields of telecommunications.” It “was created on March 1, 1993, replacing the former International Telegraph and Telephone Consultative Committee (“CCITT”) whose origins go back to 1865. The public and the private sectors cooperate within ITU-T for the development of standards that benefit telecommunication users worldwide.” ITU, The ITU Telecommunication Standardization Sector (ITU-T), at <http://www.itu.int/ITU-T/> (last updated Nov. 17, 2003).

5. “The ITU’s Telecommunication Development Bureau has well-established [programs] to facilitate connectivity and access, foster policy, regulatory and network readiness, expand human capacity through training [programs], formulate financing strategies and e-enable enterprises in developing countries.” Hamadoun I. Toure, Director BDT, Telecommunication Development Sector, ITU, at <http://www.itu.int/ITU-D/> (last visited Nov. 9, 2003).

6. Each country must implement the output of each WRC for any changes adopted to be effective in that member state.

Once the next WRC agenda is set and the WRC that adopted the agenda concludes,⁷ member states work diligently to determine their own internal position on relevant agenda items and understand the position of other member states. After individual countries finalize their positions, they will often work within regional bodies and other organizations to obtain additional support from other countries. In addition, countries will actively advocate their positions within the ITU-R process itself, whether in a technical study group meeting or a conference preparatory meeting. While many countries, because of a lack of resources, may not be able to study the full breadth of issues in detail, they try to focus on issues of importance and gain support accordingly. Generally, because WRCs often make decisions based on consensus, the more support a member state or region can obtain beforehand, the greater its chance for success at the Conference.⁸ In rare cases, the WRC may hold a vote with each Member

7. In some cases, this may even be earlier since many agenda items have been under consideration for more than one Conference or were the subject of studies that have been mandated by prior WRCs.

8. The United States has a particularly well-developed preparatory process for each WRC, which has often been labeled "mini-WRC" because it brings together a cross-section of the public and private sectors in order to develop consensus positions to present at the Conference. The United States preparatory process is a dual track process. See Jennifer A. Manner, *Survey: WRC-2000 and IMT-2000—The Search for Global Spectrum*, 9 *COMMLAW CONCEPTUS* 5 (2001).

The Department of Commerce, through the National Telecommunications and Information Administration ("NTIA"), convenes the Interdepartment Radio Advisory Committee ("IRAC"). In the IRAC, the U.S. government spectrum user community—including agencies as diverse as the U.S. Coast Guard, the Department of Defense, and the Federal Aviation Administration—meets to develop consensus positions on WRC agenda items that impact government use of the spectrum resource. See *id.* at 13 n.93; see also NTIA, IRAC Function and Responsibilities, at <http://www.ntia.doc.gov/osmhome/iracdefn.html> (last updated Apr. 21, 2003).

Simultaneously with the IRAC process, the FCC convenes an Industry Advisory Committee ("IAC") which consists of U.S. industry, FCC staff, and other government representatives. The IAC, like the WRC, meets in plenary and at the committee level with the committees assigned to substantive issues. It also develops recommended positions on agenda items for the upcoming WRC that are relevant to industry. Between the IRAC and the IAC process, there is an opportunity between the two bodies for comment, and ultimately a reconciliation process occurs.

The reconciled proposals for the FCC's IAC process and the NTIA's IRAC process are then reviewed by the State Department's Communications and Information Policy ("CIP") group. The State Department has the final say on U.S. proposals to the WRC because it has the lead on matters of foreign policy. Often the proposals for the upcoming Conference are not finalized completely until the U.S. Ambassador to WRC is appointed. Generally, countries will try to have most of their positions ready for the Conference before it convenes. The WRC Ambassador is a 120-day appointment, so generally there are only a few months from the time of appointment until the WRC is held. For example, Ambassador Janice Obuchowski was first appointed in February 2003. *Bush Names Obuchowski as WRC Ambassador*, *COMM. DAILY*, Feb. 6, 2003.

State having one vote.

The agreements reached at each Conference result in changes to the Radio Regulations. Although many of these changes become effective at the close of the Conference, for them to be truly effective, each country must implement these changes in accordance with their own domestic process. Even though there is no enforcement mechanism contained in the treaty for countries who do not abide by the Radio Regulations, the principle of comity and substantial international pressure generally lead to compliance.⁹

III. WHY IS THE WRC RELEVANT TODAY?

The WRC is very important to the success of managing the global spectrum resource because it is the sole forum in which countries are able to set international parameters on how to most efficiently utilize the radiocommunications spectrum and the orbital resource. Specifically, the WRC provides an avenue for countries to ensure that spectrum usage is harmonized to the greatest extent practicable across the globe. In addition, the outcomes of WRCs, and the associated process for reaching decisions, result in operational and technical certainty for existing services. As discussed below, both harmonization and certainty are critical to encouraging new uses in the spectrum, while ensuring that existing uses are protected from harmful interference. In addition, the WRC process generally endeavors to achieve both goals through a flexible process which allows the evolution of technology. Ultimately, this leads to the efficient use of the radiocommunications spectrum on a global basis. Achieving efficiency in the use of the spectrum resource is imperative as spectrum becomes increasingly congested with the continued introduction of new and innovative services.

A. *Harmonization of Spectrum*

The WRC process has increased in importance as a forum to maximize the opportunity for global harmonization for the use of the radiocommunications spectrum. Harmonization, in the context of the radiocommunications spectrum, refers to the ability to have discrete frequency bands available for a specific use, such as third generation mobile telephony ("3G") or wi-fi. The need for spectrum harmonization for many uses has increased because of the growing need for companies to

9. Countries who do not support an allocation decision can take a reservation through a country footnote at the end of the Conference. However, these countries have an obligation to ensure that their nonconforming use does not result in harmful interference to the conforming use of another country. *See generally*, ITU, RADIO REGULATIONS (2001).

capture global economies of scale in order to successfully market and operate telecommunications products and services. By ensuring that spectrum is available for specific uses on a harmonized basis, equipment manufacturers and service providers are able to capture the synergies associated with the widespread deployment of such telecommunications services. The effects of such synergies may include reduced manufacturing costs, since equipment manufacturers can anticipate selling equipment on a near global scale, rather than selling in a handful of countries. This should ultimately be reflected in lower costs to consumers, making these services more affordable and more widely available in both the developing and developed world.

Another benefit of harmonization is the ability to deploy global systems. In the past, the term global system was deemed synonymous with satellite systems. Accordingly, the focus of many recent Conferences was the harmonization of global spectrum for specific satellite services. Over the past decade, however, this has changed. Today, fixed and mobile wireless systems, such as 3G, have also sought access to harmonized global spectrum. These service providers are seeking to capture not only the manufacturing economies of scale that exist with global markets, but also the ability to deploy global telecommunications networks that operate seamlessly.

WRCs can enable the harmonization of spectrum in several ways. First, harmonization may occur through the adoption of an allocation of spectrum for a specific radiocommunications service, along with accompanying technical or operational conditions. This was the situation at WRC 2003 where countries sought the use of the 5 GHz band for wi-fi devices.¹⁰ Specifically, WRC 2003 considered a new allocation on a primary basis for mobile service in the 5 GHz band.¹¹ Many countries considered wi-fi to be a mobile service, and therefore were unable to license such devices without a change in the International Table of Frequency Allocations. As a result, U.S. equipment manufacturers and wi-fi service providers were strongly in favor of obtaining a new global mobile service allocation at the 5 GHz band to ensure that wi-fi services could be deployed globally on a harmonized basis.

Some of the challenges the United States faced in seeking a mobile allocation in the 5 GHz band for wi-fi were to familiarize other nations

10. *See, e.g.*, U.S. DEP'T OF STATE, UNITED STATES DELEGATION REPORT: WORLD RADIOCOMMUNICATION CONFERENCE 2003, at 1 (2003), available at http://www.fcc.gov/ib/wrc-07/docs/WRC03DelReport_final.doc.

11. The terms "primary" and "secondary" are defined levels of service rights to specified bands.

with the concept of wi-fi, and to demonstrate how these services could coexist with incumbent services. Accordingly, it was necessary for the United States and other proponents to demonstrate that the existing services in the 5 GHz band, including the radio location and earth exploration services, could be protected from potential harmful interference from wi-fi systems operating on a co-primary basis in the band. This was accomplished through a proposal to apply certain technical parameters, including Dynamic Frequency Selection (“DFS”), on wi-fi operations at the 5 GHz band.¹²

In order to obtain sufficient support for adoption of the new allocation, the United States faced the challenge of educating member states about the benefits of both wi-fi and a harmonized approach to its deployment. This was accomplished on two fronts. First, the United States engaged in extensive foreign country outreach, both before and during the Conference, in bilateral and regional meetings. Second, Cisco, one of the leading proponents of wi-fi technology, made wi-fi available throughout the WRC 2003 conference center for the duration of the Conference. This provided delegates from both developed and developing countries with the opportunity to witness the many benefits of wi-fi service firsthand. In the past, delegates to the Conference could only receive the thousands of pages of Conference documents as hard copies. Now, for the first time, delegates could simply sign on to their computer using the wi-fi access at the conference center and have up-to-the-minute access to all documents.

Despite the efforts of the United States and other wi-fi supporters on this issue, several countries, including France and Saudi Arabia, expressed concern that outdoor wireless access transmitters would cause significant interference to spaceborne active sensors (e.g., radars) that operate in the earth exploration satellite and space research services. To address these and other concerns about potential harmful interference, the United States proposed (1) limiting the new mobile service allocation to the 5150-5350 MHz and 5470-5725 MHz band, (2) requiring all wi-fi devices to be equipped with mitigation systems having technical specifications that would maintain an acceptable interference to noise ratio at the incumbent receivers, and (3) including regulatory text requiring wi-fi devices to accept interference from, and not cause interference to, other services. Ultimately, Conference delegates agreed upon this compromise approach.¹³

12. See U.S. DEP'T OF STATE, UNITED STATES DELEGATION REPORT: WORLD RADIOCOMMUNICATION CONFERENCE 4-5 (2003), available at http://www.fcc.gov/ib/wrc-07/docs/WRC03DelReport_final.doc [hereinafter DELEGATION REPORT].

13. *Id.* at 5.

This compromise provides a broad framework within which countries can deploy wi-fi type services, although some flexibility remains in the technical solutions that member states may implement. As the United States and other countries implement this allocation, industry will be able to deploy wi-fi systems globally, capturing the synergies associated with the global availability of harmonized spectrum at 5 GHz. As a result, consumers can expect greater access to broadband wireless networks at lower costs.

Another example of harmonization occurring at WRC 2003 was the agenda item that sought the creation of an international regulatory framework for satellite earth stations on vessels (“ESVs”).¹⁴ Several companies have begun to deploy ESVs on commercial cruise ships in order to offer Internet and other high-speed services to cruise passengers. However, because of existing ITU regulations, these ESVs have had to operate on a non-interference basis with existing services. Specifically, this WRC 2003 agenda item required the Conference to develop a framework that could be used as a basis for national regulations for licensing ESVs, and for reaching prior agreements with the licensing administration when the route of the ship carrying the ESV could potentially cause interference to stations in the fixed service of another administration.

Ultimately, the Conference adopted a regulatory scheme that recognized the unique nature of ESVs as mobile terminals operating in fixed-satellite service networks. Specifically, in order to address the potential for interference into other services in the same band, the Conference imposed specific limitations on ESV emissions and on the operation of ESVs outside the territory of the licensing administration.¹⁵ With the technical rules in place, the Conference was also able to adopt a nonbinding resolution that provides guidelines for administrations in adopting national regulations governing ESV usage and licensing. This has resulted in the creation of a framework by which service providers and equipment manufacturers can expect to face a more streamlined approach to licensing among differing jurisdictions. This type of harmonization is especially important due to the mobile nature of ESVs (e.g., traveling from port to port).

Another manner in which WRCs have worked towards harmonization is by identifying specific bands or encouraging the use of specific frequencies for certain uses. Through this approach, the WRC is able to

14. *Id.* at 9.

15. See WRC Advisory Committee, Draft Proposal for the Work of the Conference (Apr. 4, 2002), available at http://www.fcc.gov/ib/wrc-03/files/docs/advisory_comm/mtg8/wac101.pdf.

provide guidance to countries as to which frequencies a critical mass of countries have deployed or may deploy a particular use of the spectrum. This also signals to industry, including equipment manufacturers and service providers, in which frequency bands they should endeavor to design their networks to operate if they wish to capture global synergies.

An example of this approach at WRC 2003 was an agenda item which considered whether spectrum should be made available for public protection/disaster relief on a national basis in several frequency bands.¹⁶ Specifically, the WRC 2003 considered whether spectrum in the frequency ranges 746-806 MHz, 806-869 MHz, and 4940-4990 MHz, as well as others, should be made available for future advanced solutions for public protection and disaster relief when looking at national requirements. Many countries wanted to adopt binding treaty language on this issue. However, several countries, including the United States, supported the goals of the proposal but were concerned that this would be legally meaningless under the Radio Regulations. Specifically, for an action to have legal force under the Radio Regulations and, more importantly, in the International Table of Frequency Allocations, it must concern a radiocommunications service as defined by the treaty. Since public protection and disaster relief are not radiocommunications services, spectrum cannot be allocated for these uses. Accordingly, if the Conference had addressed this issue in the International Table of Frequency Allocations, it would not have had any binding legal force.

However, all countries thought that this agenda item was extremely important because of the public safety ramifications. Therefore, in an effort to satisfactorily resolve this issue and provide some informal guidelines to countries on where to locate these systems in order to capture the synergies of harmonization, the WRC 2003 agreed to a resolution that provides nonbinding guidance to countries on regional frequency ranges already in use for public protection and disaster relief. This type of solution provides all countries with relevant information on where it might be easiest, based on available technology, to deploy future public safety and disaster relief systems.

As discussed, maximizing the global harmonization of spectrum, to the extent it is possible to do so, serves many important interests. By ensuring that spectrum is available for global use, both developed and developing countries can have greater comfort that equipment will be available at reasonable prices for them to deploy the proposed service when they are ready.

16. See DELEGATION REPORT, *supra* note 12, at 9-10.

B. Creating Technical and Operational Certainty

Of equal importance to the harmonization that results from the WRC process is that it provides spectrum users with technical and operational certainty. Technical and operational certainty is important for governments and industry to be able to obtain funding to deploy services and for continuity of existing services. A more dynamic, less structured regime could result in chaos, especially since it may take several years to deploy a viable wireless telecommunications or satellite system, and substantially longer to recoup the investment once the system is operating.

The WRC process provides this technical and operational certainty in several ways. First, technical and operational certainty can be achieved through the allocation of spectrum to a specific service on a global basis to create a harmonized use, as discussed above. For example, increased certainty was achieved at WRC 2003 by creating a global allocation of spectrum on a secondary basis for use for aeronautical mobile satellite service ("AMSS") at the 14-14.5 GHz band. This allows for the provision of broadband Internet service via satellite on commercial and other aircraft, where before the change in the Table of Allocations, individual member states would have to approve a nonconforming use. Allocating spectrum for this use was supported strongly by the United States and Germany, as well as by many European countries, where such service was already being put into use by commercial airlines on transatlantic routes. These countries believed that failure to allocate spectrum globally for this use would ultimately make it an impractical service to provide, since each country would have to make an affirmative finding to allow such use, given that it was not consistent with the ITU's Radio Regulations. This type of uncertainty would make investment and deployment decisions by industry near impossible, hence depriving consumers of a valuable telecommunications service. Adopting an allocation for AMSS, on the other hand, would open the door to service providers around the globe as they sought market entry and would allow the deployment of an innovative use of the spectrum.

In an effort to make this proposed AMSS secondary allocation more acceptable to countries that have existing services in the band, the advocates decided substantially before the Conference that they could operate successfully in a secondary status for the allocation. This would mean that the new service would have to accept interference from and provide protection to the primary services operating in the frequency band, thus eliminating many of the concerns by some administrations about potential interference with existing services.

Despite this effort, concerns were raised at the Conference by France, the Arab Group, and the United Kingdom about the need for additional regulatory constraints to protect users within the co-primary fixed service and radio astronomy from the uses allowed by the new AMSS allocation. After much discussion, the WRC reached a compromise decision that ensures the protection of existing services in the band as well as enables the new service to go forward on a harmonized basis. Specifically, a secondary allocation for AMSS was agreed to in the relevant frequency bands, along with the adoption of certain technical limits to ensure protection to existing services in the band.

Currently, several countries, including the United States and Germany, have allowed the operation of commercial Internet service on airplanes on an interim, noninterfering basis. Now that the WRC is concluded, and the allocation to AMSS has been made, countries can implement this allocation domestically. For example, under the "Rapid Response Plan" that the United States is implementing, the FCC will shortly address the new secondary allocation to mobile-satellite service at 14-14.5 GHz and will adopt accompanying service rules.¹⁷

Such quick WRC implementation efforts, such as those taken in the United States with regard to AMSS and other WRC issues, are also imperative to create certainty.¹⁸ If countries fail to implement the decisions of the WRC that are in their national interest, the benefits of the WRC process in terms of the deployment of new and innovative services and more efficient use of the spectrum will fail to materialize.

Further, the WRC process also provides certainty as it ensures that reasoned decisionmaking occurs in arriving at the spectrum allocation decisions. The WRC preparatory process provides adequate time between Conferences to ensure that technical studies can occur to determine the potential impact of allocation decisions. For example, in the case of the AMSS secondary allocation issue at WRC 2003, the delegates were able to reach a consensus by examining technical data prepared in advance in order to ensure that services in the same frequency bands as the new service would not be subject to potential interference.

The WRC process also provides an opportunity, where appropriate, to create and manage an international regulatory framework for radiocommunications services, without subtracting from each member state's sovereignty. For example, the coordination process that has been

17. Press Release, FCC, FCC and NTIA Announce WRC-2003 Implementation Plan for 2003 World Radiocommunication Conference (WRC-03) Final Acts (Aug. 7, 2003), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-237420A1.pdf.

18. *Id.*

developed for geostationary orbit satellite systems provides countries with the ability to successfully coordinate systems in advance of launch, so they can avoid the potential for harmful interference. In addition, this coordination process is aimed at maximizing the use of orbital resources. However, the licensing of these satellite systems remains with the individual member states. Similarly, technical and operational limits incorporated into the Radio Regulations provide countries with protection against harmful interference from neighboring and other countries' radiocommunications services and uses.

Certainty is also created by the WRC process through its transparent nature. Specifically, the WRC process allows participation by governments, industry, and other international organizations in all of its meetings.¹⁹ This is extremely important, as technical and other relevant work is accomplished by the relevant experts. Such a process ensures that stakeholders who will be impacted by the decisions of WRCs are directly involved and have confidence in the process. Similarly, the deliberative approach of the WRC also instills technical and operational certainty for users of the radiocommunications spectrum.

V. CONCLUSION

The twenty-first century requires sound spectrum management on both a global and a national basis. While the sovereignty of individual nations to make domestic allocation and use decisions concerning the radiocommunications spectrum must be respected, it is imperative that the spectrum as a global resource be managed well. Specifically, as globalization in the use of the spectrum resource becomes more critical to the successful deployment of telecommunications services, the WRC process remains an important key to sound spectrum management.

19. Industry participation occurs in one of two ways. First, individual member states may choose to allow their industry to become private sector members of the ITU. Second, member states may also designate industry representatives to serve on their national delegation to the WRCs and other technical and preparatory meetings. The United States allows both types of participation to occur. *See Manner, supra* note 8.