**Journal Title:** ITU News

**Journal Issue:** No. 6 (2003)

**Article Title:** Global needs, global solutions : WRC-03 delivers a blueprint for the current and future needs of the global radiocommunication sector

**Page number(s):** pp. 2-8

# Global needs, global solutions

## WRC-03 delivers a blueprint for the current and future needs of the global radiocommunication sector


*Veena Rawat (Canada), the first woman to chair a world radiocommunication conference, receives gold medal from ITU Secretary-General, Yoshio Utsumi, in honour of her great service to the Union*

### Making history

For the first time in the history of ITU, a woman chaired the World Radiocommunication Conference (WRC-03) that ended on 4 July with a blueprint reflecting current and future needs of the global radiocommunication sector. Veena Rawat, a well-known and highly respected figure in the international radiocommunication community was unanimously elected Chairman of WRC-03. Ms Rawat is Vice President of Marketing and Business Development at Communications Research Centre Canada, an appointment she took up recently. Prior to this, she was Deputy Director-General of Spectrum Engineering at Industry Canada.

### Veena awarded gold medal

At the closing ceremony, ITU Secretary-General, Yoshio Utsumi, presented Ms Rawat with a gold medal prepared specially to honour her great service to the Union. "She has shown great skill in her leadership of the conference and her ability to find common ground between different parties and interests. Her knowledge of the issues, as well as her patience and endurance are worthy of our respect and admiration, not to mention her toughness and energy," he said.

Ms Rawat had to deal with an unprecedented work schedule reflected in a record number of agenda items (48), including three that were added by the conference itself and related to the coordination and notification of satellite networks.

### Cooperation, consensus and conservation of time and energy

When the Conference opened on 9 June at the Geneva International Conference Centre, she told delegates that the sheer size of the agenda made it imperative that they work with unprecedented efficiency. She asked delegates to keep in mind three words, "cooperation, consensus and conservation of time and energy". She was pleased to note that, "consensus of a significant number of issues had already developed as a result of the preparatory work, and from cooperation in various regional and inter-

## Conference structure

### Chairman and Vice-Chairmen of the Conference

**Chairman:** Veena Rawat (Canada)
**Vice-Chairmen:**
Region A: Ms J. Obuchowski (United States)
Region B: F. Rancy (France)
Region C: L. Reiman (Russian Federation)
Region D: W.K. Chepkwony (Kenya)
Region E: G. Xi (China)
Region E: N. Kisrawi (Syrian Arab Republic)

### Chairmen and Vice-Chairmen of the Committees

Committee 1 — Steering Committee
This Committee is composed of the Chairman and Vice-Chairmen of the Conference and of the Chairmen and Vice-Chairmen of all the Conference Committees.

**Committee 2 — Credentials**
Chairman: J. Edane Nkwele (Gabon)
Vice-Chairman: A. Krutskikh (Russian Federation)

**Committee 3 — Budget Control**
Chairman: B.A. Gracie (Canada)
Vice-Chairman: S. Glotov (Ukraine)

**Committee 4 — Specified agenda items**
Chairman: E. George (Germany)
Vice-Chairmen: B. Nurmatov (Kyrgyzstan)
B. Chaudhuri (India)
J.-B. Yao (Côte d'Ivoire)

**Committee 5 — Specified agenda items**
Chairman: A.R. Jamieson (New Zealand)
Vice-Chairmen: E. Sestakov (Moldova)
E. Kosaka (Japan)
M. Bessi (Morocco)

**Committee 6 — Appendices 30, 30A and 30B**
Chairman: K. Arasteh (Islamic Republic of Iran)
Vice-Chairmen: S. Djematene (Algeria)
J.C. Albernaz (Brazil)

**Committee 7 — Future agenda and work programme**
Chairman: A. Nalbandian (Armenia)
Vice-Chairmen: K.J. Wee (Republic of Korea)
R. González Bustamante (Mexico)

**Committee 8 — Editorial**
Chairman: L. Bourgeat (France)
Vice-Chairmen: L. Barclay (United Kingdom)
C. Menéndez Argüelles (Spain)

regional forums". The four-week conference was opened by Richard Butler, a former Secretary-General of ITU (1982–1989), appointed as the Dean of the event.

Mr Utsumi had this to say to the 2500 delegates at the opening ceremony: "Since we spend so much time and effort on these matters, we should be able to say to our families, friends and neighbours that because of our work in Geneva, all our lives will be improved. I am sure that we can achieve all this through constructive discussions with mutual cooperation and with efficiency."

The need for efficiency was reinforced by the Director of the Radiocommunication Bureau, Valery Timofeev, who said that the size and scope of the agenda would "test all of our skills in being able to consider the 2500 individual proposals and within less than four weeks to reach conclusions and decide on Final Acts to reflect those conclusions".

WRC-03 took a number of landmark decisions to deal with the increasing pressure placed on the radio-frequency spectrum — a limited natural resource belonging to all of humanity.

Summing up the achievements, Ms Rawat said: "I am certain that the decisions of this conference will have a positive impact on all citizens, the telecommunication industry and telecommunication service operators.

The following is a synopsis of some of the highlights of WRC-03.

## Some of the major milestones

### Mobile wireless access systems get global allocation

A big question for WRC-03 was whether it could make a global allocation of spectrum at 5 GHz for mobile wireless access systems (WAS), including radio local area networks (RLAN). WRC-03 successfully established new frequency allocations on a primary basis to the mobile service in the bands 5150 – 5350 MHz and 5470 – 5725 MHz. Wireless devices that do not require individual licences are being used to create broadband networks in homes, offices and schools. These networks are also being used in public facilities in so-called hot spots such as airports, cafés, hotels, hospitals, train stations and conference sites to offer broadband access to the Internet. An example of the efficiencies produced by these networks was seen at the heart of the conference centre itself. The work of the conference was easier, in terms of providing delegates fast and easy access to documents and to their corporate intranets.

The lower part of the 5 GHz spectrum will be predominantly used for indoor applications, with the first 100 MHz (5150 – 5250 MHz) restricted to indoor use. Further, the use of these frequency bands is conditional to provisions that provide for interference mitigation mechanisms and power emission limits to avoid interference into other radiocommunication services operating in the same spectrum range.

### Public protection and disaster relief: A major breakthrough

Today's public protection and disaster relief applications are mostly narrow-band supporting voice and low data-rate applications, typically in channel bandwidths of 25 kHz or less. It is anticipated that many future applications will be wideband (with data rates in the range of 384–500 kbit/s) and/or broadband (with data rates in the range of 1–100 Mbit/s). At the conference, many countries expressed the wish to promote interoperability and interworking between systems used for public protection and disaster relief, both nationally and for cross-border operations in emergency situations.

A new Resolution paves the way for the deployment of new technologies for wideband and broadband public protection and disaster relief applications. The Resolution also identified the frequency bands/ranges listed below to achieve regionally harmonized spectrum for advanced public protection and disaster relief solutions:

- **Region 1(Africa and Europe):** 380 – 470 MHz as the frequency range within which the band 380 – 385/390 –395 MHz is a preferred core harmonized band for permanent public protection activities within certain agreed countries of Region 1.
- **Region 2 (Americas):** 746 – 806 MHz, 806 – 869 MHz, 4940 – 4990 MHz
- **Region 3 (Asia and Australasia):** 406.1–430 MHz, 440–470 MHz, 806 – 824/851 –


*From left to right (at the closing ceremony): Hamadoun I. Touré, Director of the Telecommunication Development Bureau; Houlin Zhao, Director of the Telecommunication Standardization Bureau; Roberto Blois, ITU Deputy Secretary-General; Yoshio Utsumi, ITU Secretary-General; Roger Smith, Secretary of the Conference Plenary; Veena Rawat, Chairman of the Conference; and Valery Timofeev, Director of the Radiocommunication Bureau*

869 MHz, 4940 – 4990 MHz and 5850 – 5925 MHz (some countries in Region 3 have also identified the bands 380 – 400 MHz and 746 – 806 MHz for public protection and disaster relief applications).

Countries are encouraged to consider these frequency bands/ranges or parts thereof when undertaking their national planning. They are also called upon to encourage public protection and disaster relief agencies and organizations to utilize relevant Recommendations of the ITU Radiocommunication Sector (ITU–R) in planning spectrum use and implementing technology and systems supporting public protection and disaster relief.

Manufacturers are encouraged to take this Resolution into account in future equipment designs, including the need for countries to operate within different parts of the identified bands.

## Global spectrum allocation approved for broadband Internet on board aircraft

The conference has opened the door for the commercial deployment of a new mobile information service: the two-way real-time broadband connectivity to aircraft passengers and crew. Its agreement to extend the secondary mobile-satellite service allocation in the 14 – 14.5 GHz band to include the aeronautical mobile satellite service came into force on 5 July 2003. Prior to WRC-03, this frequency band already included a secondary allocation to the mobile-satellite service (MSS) — albeit with the exclusion of the aeronautical mobile-satellite service (AMSS).

With the restriction "except aeronautical mobile-satellite service" now removed from the 14 – 14.5 GHz band allocation, companies like Connexion by Boeing have the green light to provide real-time communications to and from aircraft in flight.

"Clearing this critical hurdle paves the way for global introduction of our high-speed in-flight connectivity service beginning next year," commented Connexion by Boeing President, Scott Carson. For passengers, the new service includes e-mail , corporate intranet connectivity, shopping and travel destination information.

## A happy landing for aeronautical services

The need for compatibility between aeronautical and broadcasting services posed some challenges for WRC-03. Aeronautical systems are converging towards a digital environment that supports aeronautical navigation and surveillance functions, which need to be accommodated in existing radio spectrum. Some countries are planning to introduce digital sound broadcasting systems in the frequency band at about 87 – 108 MHz. However, at present, there are no compatibility criteria between FM broadcasting

## CITEL and ATU sign cooperation agreement at WRC-03

*The American and African regional organizations, known as the Inter-American Telecommunication Commission (CITEL) of the Organization of American States and the African Telecommunications Union (ATU), signed a cooperation agreement at WRC-03.*


*Pictured during the signing ceremony (from left to right) are: Hezron Olouch (representing the Chairman of the ATU Conference of Plenipotentiaries); Jan Mutai, Secretary-General of ATU; Ambassador Janice Obuchowski, Head of the US delegation to WRC-03; Veena Rawat, Chairman of WRC-03; Paulo Cordoba (representing the Chairman of COM/CITEL); Clovis Baptista Neto, Executive Secretary of CITEL; and Yoshio Utsumi, ITU Secretary-General. The agreement was signed by messrs Baptista and Mutai*

*The countries of the Americas and Africa have agreed to work together to build closer cooperation ties between themselves and ITU. Both parties will coordinate, as far as possible, their positions on matters of common interest. In particular, they will focus their efforts in areas of telecommunication development in both regions, exchanging experience and relevant documentation.*

systems operating in this band and the planned additional aeronautical systems in the adjacent band 108 – 117.975 used for aircraft transmission.

A new Resolution on the "Use of the band 108 – 117.975 MHz by aeronautical services" recognizes the need for the aeronautical community to provide additional services in order to enhance navigation and surveillance systems through a future communication data link. This Resolution also takes account of the need for the broadcasting community to provide digital terrestrial sound broadcasting.

A new footnote was also approved (5.BA03) that allows the additional use of the band 108 – 117.975 MHz by the aeronautical mobile radionavigation service on a primary basis. However, this use is limited to systems that transmit navigational information in support of air navigation and surveillance functions in accordance with recognized international aviation standards. Surveillance functions include the observation of aircraft location, velocity and weather conditions for the purpose of air traffic control and situational awareness/collision avoidance between aircraft.

### Future development of IMT-2000 systems and beyond

IMT-2000 systems are third-generation (3G) mobile systems, which provide access to a plethora of services supported by fixed telecommunication networks, such as the public switched telephone network (PSTN), integrated services digital network (ISDN) and the Internet Protocol (IP).

As the industry moves beyond IMT-2000 systems, the demand for multimedia applications, such as high-speed data, IP-packet and video are expected to increase. ITU has reaffirmed its support for the continuing development of mobile wireless communications by recognizing the need to provide a global vision for the future development of IMT-2000 and systems beyond IMT-2000. As part of this commitment, ITU will study technical and operational issues on how these systems will evolve, and develop Recommendations as required. It will also study, in time for WRC-07, frequency-related matters for the future development of these systems. The studies will focus on the:

- evolving user needs, including the growth in demand for IMT-2000 services;
- evolution of IMT-2000 and pre-IMT-2000 systems through advances in technology;
- bands currently identified for IMT-2000;
- time-frame in which spectrum would be needed;
- period for migration from existing to future systems;
- extensive use of frequencies below those identified in the Radio Regulations for IMT-2000.

These studies will take into account the particular needs of developing countries, including the use of the satellite component of IMT-2000.

## Earth stations located on board vessels

The question of whether earth stations on board vessels (ESV) should be considered as a fixed-satellite service or a mobile-satellite service generated a great deal of debate. On one side of the argument were countries who considered ESV as a mobile maritime satellite service. On the other were those who argued that ESV is a fixed-satellite service.

There is a demand for global wideband satellite communication services on vessels. And the technology exists that enables ESVs to use fixed-satellite service (FSS) networks to provide a wide variety of communication services such as Internet access, including high-speed data, voice and video applications. However, the provision of such services creates regulatory challenges for some countries, as ESVs have the potential to cause unacceptable interference to other services, notably in the bands 5925 – 6425 MHz and 14 – 14.5 GHz. The conference considered that without special regulatory provisions, ESVs could end up causing a heavy coordination burden, especially for countries in the developing world. In the end, the conference agreed on the regulatory and operational provisions and technical limitations for ESVs transmitting in FSS bands 5925 – 6425 MHz and 14 – 14.5 GHz.

## Radio astronomy

The science of radio astronomy plays a fundamental role in increasing our understanding of the universe. Radio astronomy is a so-called "passive service" in the sense that it never causes interference to other users of radio. But it is becoming very difficult to protect radio astronomy observatories from man-made interference as the use of the radio-frequency spectrum on Earth and in space becomes heavily congested. Unwanted emissions produced by stations of the active space services may cause unacceptable interference to stations of the radio astronomy service (RAS).

At this conference, RAS was looking for protection from the satellite downlink allocations in bands adjacent to radio astronomy bands. Proposals on this matter ranged from "no change" to the current Radio Regulations to placing hard limits for the unwanted emissions from satellites. The conference reached a compromise by suggesting threshold levels for unwanted emissions in certain bands and requirement for consultation in the event these levels are exceeded. This matter will be a subject of further ITU-R studies.

## Radio amateur matters

The amateur service was looking for an exclusive, worldwide allocation in the vicinity of 7 MHz of no less than 300 kHz. WRC-03 considered the realignment of allocations to the amateur, amateur-satellite and broadcasting services around 7 MHz on a worldwide basis. At the time of the Washington International Radiotelegraph Conference in 1927, the width of the amateur 7-MHz band was set at 300 kHz worldwide. This 300-kHz band remained a worldwide, exclusive amateur allocation until the Cairo Conference of 1938, when the top portion of the band was made available for broadcasting outside the Americas (Region 2). Since then, only the amateur service in Region 2 had access to 300 kHz.

Initial discussions on the 7 MHz realignment showed fundamental differences of opinion between proponents of realignment and those advocating "no change" on the grounds that disruptions to the broadcasting and fixed services would outweigh any benefits. As a first step towards balancing amateur service needs and broadcasting interests, WRC-03 took a landmark decision to add 100 kHz of bandwidth on a global basis.

The conference also agreed to shift broadcasting stations in Regions 1 and 3 from the 7100 – 7200 kHz band and to reallocate this band to the amateur service in those two Regions. This change will take effect on 29 March 2009. In Region 2, the allocation of 7000 – 7300 kHz remains exclusively for the amateur service.

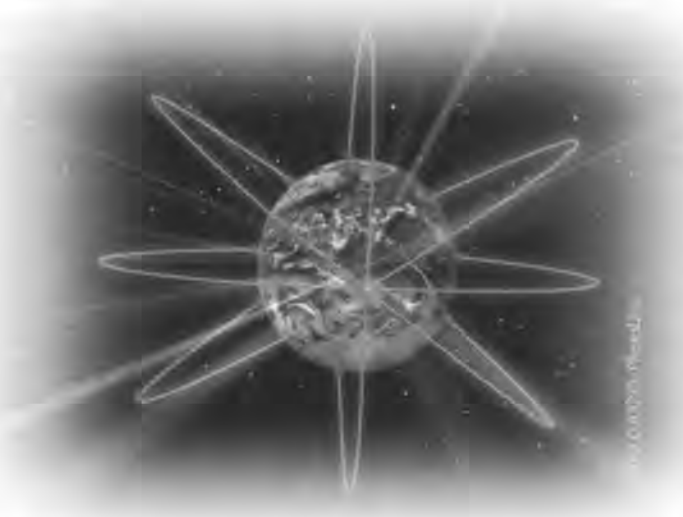
Footnotes were also agreed upon to give some countries the flexibility with respect to their fixed, mobile and broadcasting services.

## Morse code proficiency, now a matter of discretion for individual countries

Revisions to Article 25 of the Radio Regulations now leave it to the discretion of individual countries to decide whether a person seeking a licence to operate an amateur station needs

to demonstrate the ability to send and receive texts in Morse code signals. Before WRC-03, it was a mandatory, international regulatory requirement to master Morse code as a prerequisite for obtaining an amateur radio operator's licence to operate below 30 MHz.

Another revision to this Article makes it possible for amateur stations to be used for transmitting international communications on behalf of third parties, but only in cases of emergencies or disaster relief. Again, it is up to individual countries to determine the applicability of this provision to amateur stations under their jurisdiction.



## Broadcasting-satellite service — BSS (sound): The sharing challenge

Another hotly debated issue was the use of the 2.5 GHz band. The conference reviewed the results of studies concerning frequency sharing between BSS (sound) and terrestrial services in the band 2630 – 2655 MHz. This issue relates to the protection of terrestrial IMT-2000 systems from geostationary and non-geostationary satellite BSS systems. The key challenge here was the request by Japan and the Republic of Korea to seek spectrum allocations and regulatory provisions for BSS (sound) services in frequencies in this range. It was a difficult task balancing the interests of these countries in Region 3 to implement BSS (sound) while protecting the future use of this band by the terrestrial component of IMT-2000. The matter was resolved to the satisfaction of all.

## Radionavigation-satellite systems

Today, the global navigation satellite system (GNSS) consists of the United States' Global Positioning System (GPS), and Russia's Global Navigation Satellite System (GLONASS). There are plans to upgrade these systems to second-generation systems. Meanwhile, spectrum was allocated at WRC-2000 for new radionavigation-satellite service (RNSS) systems like Galileo. But while the green light was given to Europe's Galileo project at WRC-2000 — which Europe wanted in order to reduce its dependency upon a single global system — a number of follow-up items turned up the heat on this debate, making this one of the most difficult issues of the conference.

An important challenge was to establish technical and regulatory conditions for the operation of these systems and for the protection of existing uses. The conference confirmed the technical provisions for the use of the new bands for RNSS (i.e., GPS, GLONASS and Galileo). It also established regulatory provisions for consultation and coordination of the different RNSS systems.

## Meeting the needs of small terminals in FSS in the 13.75 – 14 GHz band

The special requirements of geographically "small or narrow countries" operating fixed-satellite service (FSS) earth stations in the band 13.75 – 14 GHz have been addressed through a new Resolution, which provides a way forward on how best to coordinate land-based radars. There had been much discussion on finding a technical solution for sharing between radiolocation, radionavigation and space research and FSS in the band 13.75 – 14 GHz. The main issue was how to relax the current limit on earth stations operating with GSO satellite networks from 4.5 m to a smaller antenna used by very small aperture terminals (VSAT). At the same time, since the band is used by land, ship and airborne radars, it was critical to ensure protection of these radars. The conference established technical conditions to ensure compatible operation of these uses. ■