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Key outcomes of the World Radiocommunication Conference 2019

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150 years of ITU News
1869–2019

Paving the way for a better future

Mario Maniewicz

Director of the ITU Radiocommunication Bureau

The agreements reached at the World Radiocommunication Conference 2019 (WRC-19) will favourably impact the lives of billions of people around the world, creating a digital landscape for sustainable growth and development.

WRC-19 paves the way for new, more innovative ways to connect the world, both through terrestrial and space-based communication technologies.

The decisions reached in Sharm El-Sheikh will enable the introduction of new technologies and the protection of existing services. They will allow people and industries to benefit from the advances of radiocommunication technologies.

We owe this to the hard work of the WRC-19 delegates from around the world. They honoured ITU's 154-year-old legacy of finding consensus for practical solutions to ensure that people everywhere can benefit from the latest communications technologies available.

As new industrial developments are born out of leading-edge broadband technology, people in underserved areas will also get better and more affordable access.

ITU is at the heart of this effort.

As we look to the future, I am confident that the outcomes of this conference, which was the largest WRC ever, will have a profound positive impact on people's lives for decades to come.

> *"The decisions reached in Sharm El-Sheikh will enable the introduction of new technologies and the protection of existing services."*
>
> Mario Maniewicz

Key outcomes of the World Radiocommunication Conference 2019

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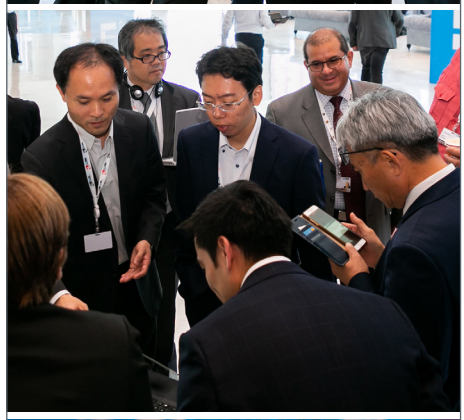
Looking ahead

Other news during WRC-19

ITU News Magazine turns 150



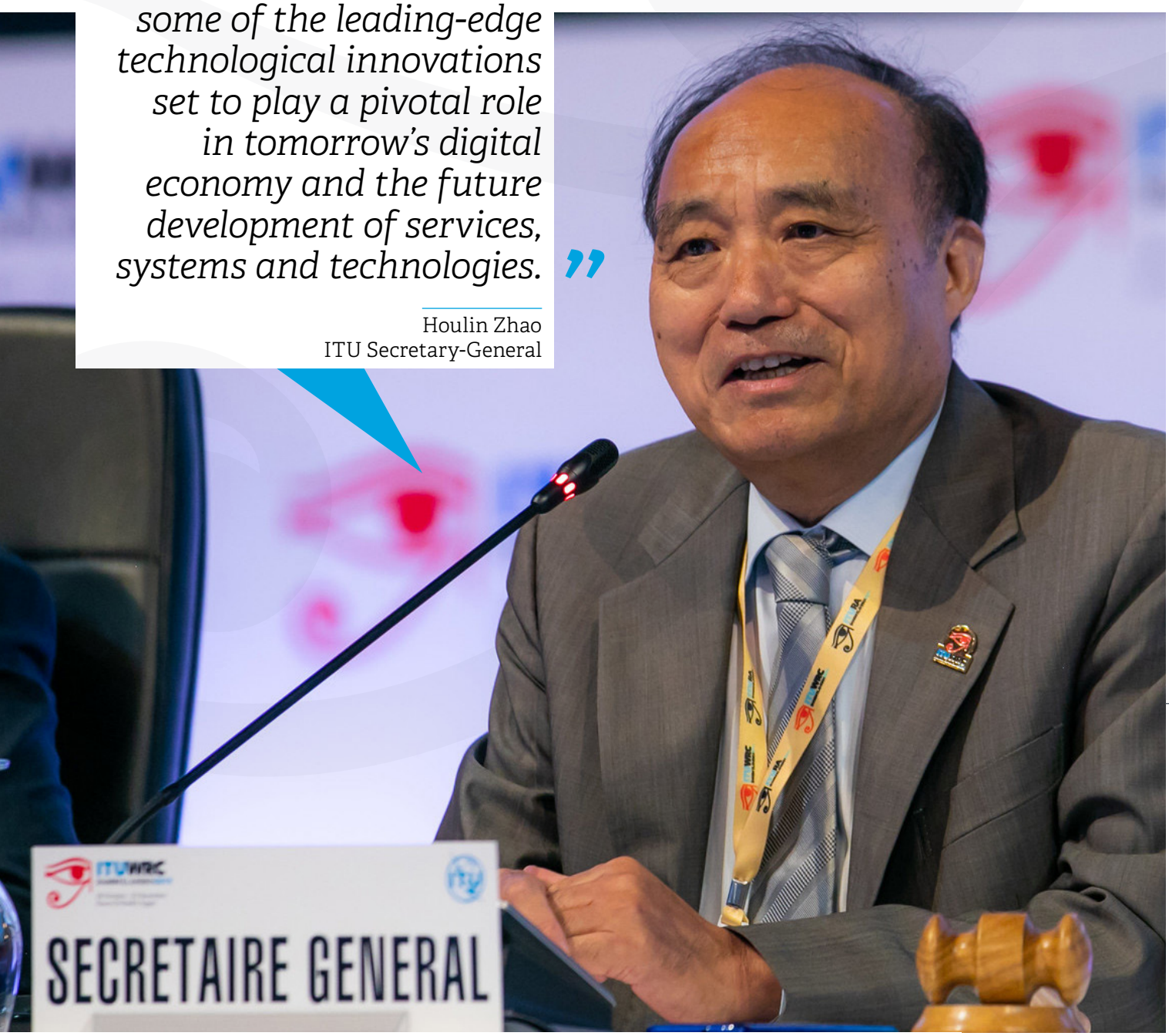
WRC-19 welcomes ITU Member States

António Guterres, United Nations Secretary-General delivers a video message to the WRC-19 Opening Ceremony.

Abdel Fattah Al-Sisi, President of Egypt (left); Houlin Zhao, ITU Secretary-General (right); Amr Talaat, Egypt's Minister of Communications and Information Technology (centre).

"The World Radiocommunication Conference will address some of the leading-edge technological innovations set to play a pivotal role in tomorrow's digital economy and the future development of services, systems and technologies."

Houlin Zhao
ITU Secretary-General

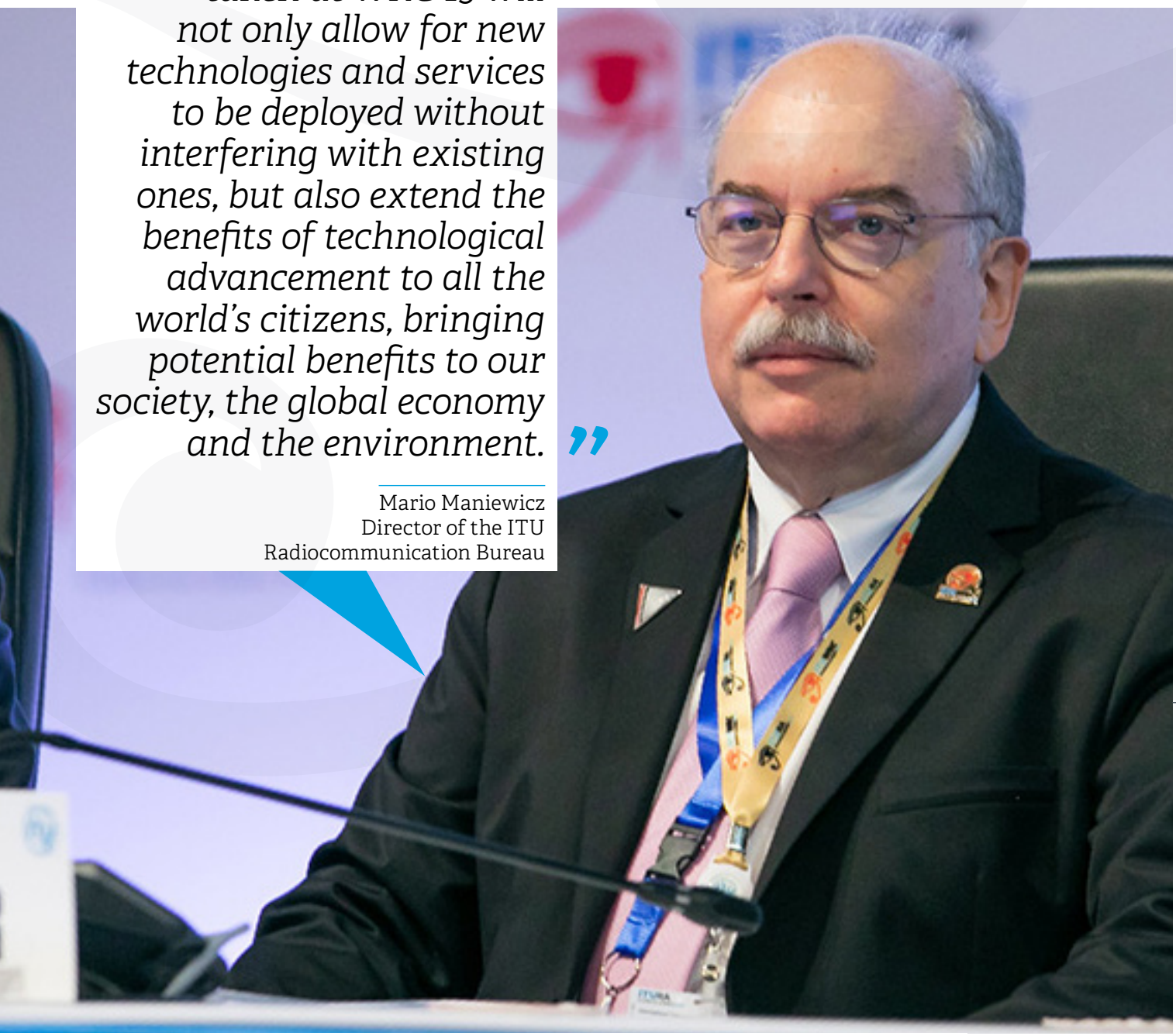


Houlin Zhao, ITU Secretary-General
(Speaking at the WRC-19 Opening Ceremony)

"As we move into an era of both digital and environmental transformation, we must ensure that the decisions taken at WRC-19 will not only allow for new technologies and services to be deployed without interfering with existing ones, but also extend the benefits of technological advancement to all the world's citizens, bringing potential benefits to our society, the global economy and the environment."

Mario Maniewicz
Director of the ITU
Radiocommunication Bureau

Listen to podcast speech.



Mario Maniewicz, Director of the ITU Radiocommunication Bureau
(Speaking at the WRC-19 Opening Ceremony)

Setting the agenda …

The 38th World Radiocommunication Conference (WRC-19) opened on 28 October 2019 in Sharm El-Sheikh, Egypt.

ITUWRC SHARM EL-SHEIKH2019

Here are some of the key topics discussed at WRC-19:

- IMT-2020, also known as 5G
- The Global Maritime Distress and Safety System (GMDSS)
- Earth exploration and meteorological-satellite systems
- Earth stations in motion (ESIM)
- Non-geostationary satellite orbit (non-GSO) systems
- High-altitude platform station (HAPS) systems
- Radiocommunication systems between train and trackside for high-speed railway
- Communication over wireless access systems, including radio local area networks (WiFi).

… for tomorrow's digital economy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SHARM EL-SHEIKH 2019
28 October - 22 November
Sharm El-Sheikh, Egypt
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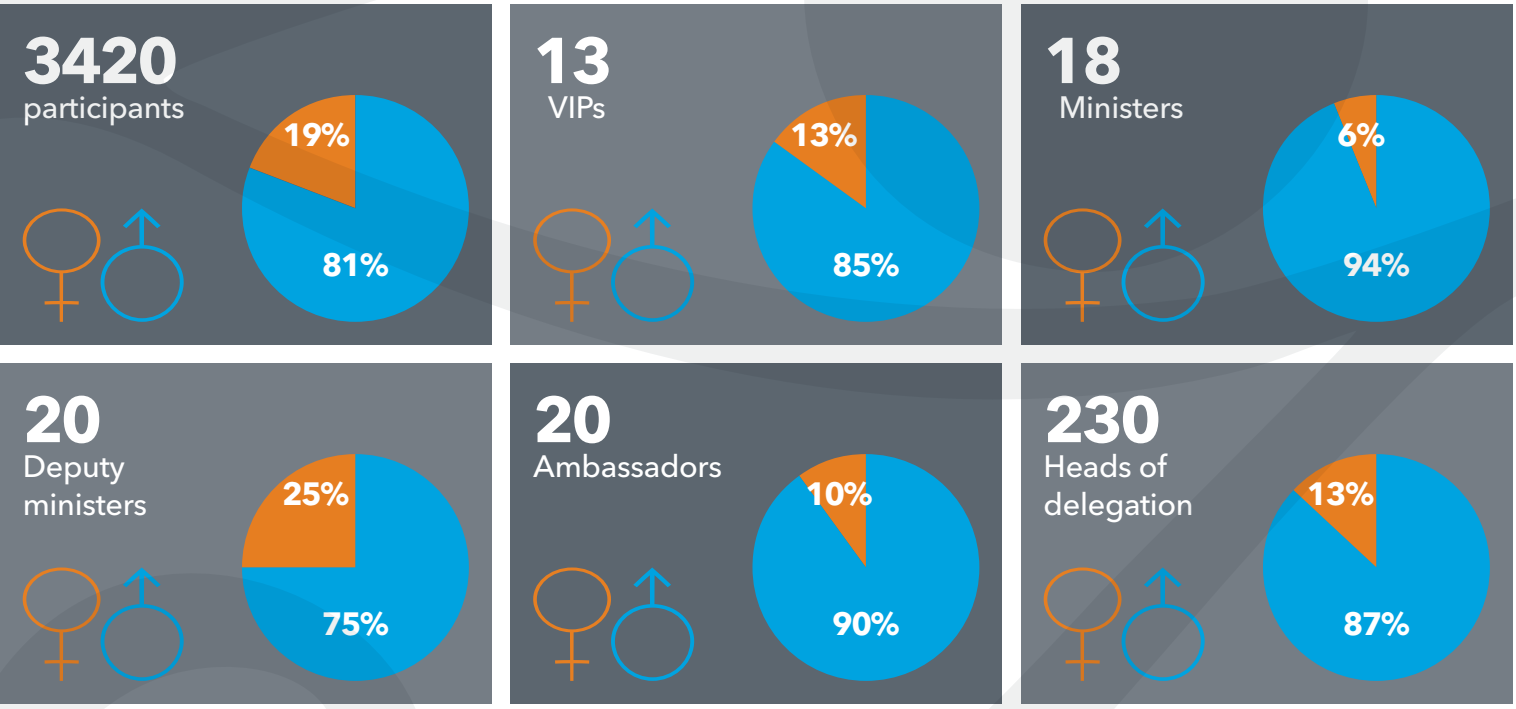
WRC-19 by the numbers



163 countries

568 documents

14 plenaries

51 amended existing resolutions

52 new resolutions

A 113 year-old international treaty

Reaching consensus in Egypt for future digital communications

Four years of preparatory studies culminated in four weeks of intense negotiations in Sharm El-Sheikh, Egypt, to review and revise the Radio Regulations, the international treaty governing the use of the radio-frequency spectrum and satellite orbits.

In his opening address to participants on 28 October, ITU Secretary-General, Houlin Zhao, said that WRC-19 would address some of the leading edge technological innovations set to play a pivotal role in tomorrow's digital economy and the future development of services, systems and technologies. He noted that digital inclusion provides the chance to improve the lives of millions across the world.

"The increased complexity of the WRC is due to the extensive number of radiocommunication services requiring the use of spectrum and orbital resources for new applications; to the limited time to conduct sharing and compatibility studies in the study groups; and to the different needs of each Member State", said Zhao.

"Today, even as billions of people and devices are connected to the Internet, increasing the efficiency of industries and companies, half the world remains unconnected", said Mario Maniewicz, Director of the ITU Radiocommunication Bureau.

Mr Maniewicz went on to say: "As we move into an era of both digital and environmental transformation, we must ensure that the decisions taken at WRC-19 will not only allow for new technologies and services to be deployed without interfering with existing ones, but also extend the benefits of technological advancement to all the world's citizens, bringing potential benefits to our society, the global economy and the environment".

The ITU Secretary-General thanked the Government of Egypt for hosting one of ITU's landmark conferences in Sharm El-Sheikh.

Egypt has been a Member State of ITU since 1876.

Chairman gives guiding principles

During the first plenary the Chairman of the Conference, Dr Amr Badawi of Egypt, urged ITU Member States to consider the spirit of mutual understanding, collaboration, demonstration of latitude, flexibility and tolerance as guiding principles enabling WRC-19 to reach consensus on the different items on the agenda.

Over 3400 participants from 163 of ITU's 193 Member States attended the 2019 World Radiocommunication Conference (WRC-19), along with over 260 observers from among ITU's 900 private Sector Members as well as members of international organizations.

Minute of silence in memory of Tarek Kamel

The Conference observed a minute of silence in memory of Tarek Kamel, former Minister of Communications and Information Technology of Egypt, who had played an important role in advancing ICTs in Egypt, Africa and the Middle East, and who had recently passed away.

Why is global cooperation important?

To celebrate #UNDay on 24 October, ITU asked WRC delegates – UN diplomats, business people, scientists, policy-makers and regulators, why global cooperation is so important.

WRC-19 video interviews

ITU interviewed a number of participants at WRC-19 to learn their different viewpoints and perspectives of the various topics on the table for discussion.

Conference structure

Dr Amr Badawi of Egypt was appointed Chairman of the World Radiocommunication Conference 2019 (WRC-19).

Committee 1 (Steering Committee)

Composed of the Chair and Vice-Chairs of the Conference and the Chairs and Vice-Chairs of the Committees

Committee 1 coordinated all matters connected with the smooth execution of the work of WRC-19, including planning the order and number of meetings, while avoiding overlap wherever possible in view of the limited number of members of some delegations.

Committee 2 (Credentials Committee)

Chaired by Mr Timofey Kim of Kazakhstan

Committee 2 verified the credentials of delegations and reported on its conclusions to the Plenary Meeting within the time specified by the latter.

Committee 3 (Budget Control Committee)

Chaired by Mr Daniel Obam of Kenya

Committee 3 determined the organization and the facilities available to the delegates, examined and approved the accounts for expenditure incurred throughout the duration of the Conference, reported on the estimated total expenditure, and submitted an estimate of the financial implications.

Considering items on the conference agenda

On the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, taking account of the decisions of WRC-15, and with due regard to the requirements of existing and future services in the bands under consideration, Committees 4, 5 and 6 considered and took appropriate action with respect to items on the conference agenda.

Committee 4 (Specified agenda items)

Committee 4 dealt the following items on the WRC-19 agenda:

- (item 1.1); (item 1.8); (item 1.9) (item 1.9.1); (item 1.9.2); (item 1.10); (item 1.11); (item 1.12); (item 1.13); (item 1.14); (item 1.15); (item 1.16); (parts of item 3); (parts of item 5); (item 9); (parts of item 9.1); (parts of item 9.2).

Chaired by Mr Jose Arias of Mexico

Committee 5 (Specified agenda items)

Chaired by Mr Nobuyuki Kawai of Japan

Committee 5 dealt with the following items on the WRC-19 agenda:

- (item 1.2); (item 1.3); (item 1.4); (item 1.5); (item 1.6); (item 1.7); (parts of item 3); (parts of item 5); (item 7); (item 9): (parts of item 9.1), (parts of item 9.2); (item 9.3).

Committee 6 (Specified agenda items)

Chaired by Mr Martin Weber of Germany

Committee 6 dealt with the following items on the WRC-19 agenda:

- (item 2); (parts of item 3); (item 4); (parts of item 5); (item 6); (item 8); (item 9): (parts of item 9.1) (parts of item 9.2); (item 10).

Committee 7 (Editorial)

Chaired by Mr Christian Rissone of France

The Editorial Committee perfected the form of the texts to be included in the Final Acts of the Conference for submission to the Plenary Meeting.

Ad Hoc Group of the Plenary

Chaired by Ms Cindy Cook of Canada

The Ad Hoc Group of the Plenary developed a Draft Declaration on gender equity that was adopted by ITU Member States (see the article on promoting gender equality at WRC-19).

Cindy Cook will be chairing the Conference Preparatory Meeting for WRC-23.

Video insights

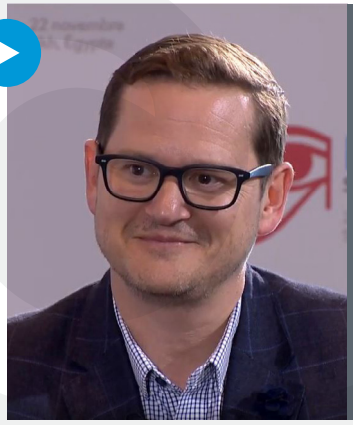
Thought leaders from both the public and private sector shared their insights on the various topics being discussed at WRC-19.

Aarti Holla

Secretary-General of the EMEA Satellite Operators Association (ESOA)

(a member of the Global Satellite Coalition (GSC))

"Without satellite there will be no 5G. Without satellite we will not achieve the Sustainable Development Goals."



Brett Tarnutzer

Head of Spectrum, GSMA

"Mobile connects over 5 billion people in the world today. 5G is not just going to be something for the developed markets, it's also going to be something for the developing world."

Ruth Pritchard-Kelly

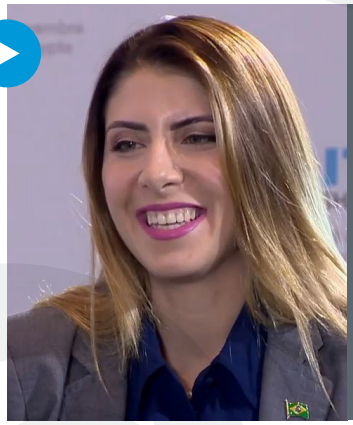
VP Regulatory Affairs, OneWeb

"The new generation of satellites are being mass-produced on assembly lines. In years past, it took up to a year to build a single satellite by hand. Now we're building a satellite a day."

Arturo Robles

Commissioner, Federal Institute of Telecommunications (IFT), Mexico

"For us it is very important to maintain all the satellite services but also to continue moving in the innovative services such as 5G, HAPS, and all these new solutions that this new digital transformation is providing to us."



Luciana Ferreira

Services Telecommunications Specialist, ANATEL

"We are shaping the future at WRC. We are trying to forecast what will happen in the future, and try to find regulation that will set the boundaries."

Dong Zhou

Director of Spectrum Policy and Regulatory Affairs, ZTE Corporation

"Nearly half the world population is not connected to the Internet yet. HAPS has the potential to provide the broadband infrastructure to this underserved area and other remote + rural areas."

See more video interviews here.

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Key outcomes of WRC-19 in brief

The World Radiocommunication Conference 2019 (WRC-19) concluded on 22 November with agreements reached by some 3400 delegates from 163 Member States. These agreements were enshrined in the provisional Final Acts of the Radio Regulations, the international treaty governing the global use of radio-frequency spectrum and satellite orbits.

The following is a list of some of the key WRC-19 outcomes in brief:

- Additional globally harmonized frequency bands were identified for International Mobile Telecommunications (IMT), including IMT-2020 (otherwise known as 5G mobile), facilitating diverse usage scenarios for enhanced mobile broadband, massive machine-type communications and ultra-reliable and low-latency communications.
- Protections were accorded to the Earth-exploration satellite service (EESS) as well as meteorological and other passive services in adjacent bands, such as the space research service (SRS) to ensure that space-based monitoring of the Earth and its atmosphere remain unhindered.
- Satellite services supporting meteorology and climatology that aim to safeguard human life and natural resources will be protected from harmful radio-frequency interference, as will systems used by radio astronomers for deep space exploration.

- Radio astronomy stations will be protected from any harmful radio interference from other space stations or satellite systems in orbit.
- New orbital slots were opened up for broadcasting satellites, providing developing countries with the opportunity to regain access to spectrum orbit resources thanks to a priority mechanism especially set for them.
- A stable regulatory framework was defined for non-geostationary satellite orbit (non GSO) systems based on a milestone process enabling mega constellations to rapidly come to fruition. This will ensure that more affordable means of connectivity can be offered to citizens of all countries.
- Earth stations in motion will enable connectivity in planes, ships, and trains.
- The provision of a truly global maritime distress and safety system was ensured and expanded.
- A new Recommendation was approved on Intelligent Transport Systems towards connecting vehicles, improving traffic management and assisting safe driving.
- Measures were taken to ensure the continuous assistance and support for the timely implementation of new technologies, including 4G and 5G networks and services, in Palestine.
- The conference declared the commitment of the Sector to gender equality, and gender balance.
- WRC-19 agreed to recommend to the ITU Council that a World Radiocommunication Conference be held in 2023 (WRC-23) for a maximum period of four weeks. WRC-19 agreed on over twenty agenda items for WRC-23, and decided to invite the ITU Council to finalize the agenda.
- WRC-19 also agreed to invite the Council to arrange for the convening of a World Radiocommunication Conference in 2027 (WRC-27), and for the Council to finalize the agenda for that conference.

The articles that follow explain a few of the key outcomes of WRC-19.

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Additional frequency bands identified to support 5G

The ITU Member States identified additional radio-frequency bands for International Mobile Telecommunications (IMT), which will facilitate the development of fifth-generation (5G) mobile networks.

5G is expected to connect people, things, data, applications, transport systems and cities in smart, networked communication environments. It will transport a huge amount of data much faster, reliably connect an extremely large number of devices and process very high volumes of data with minimal delay.

5G technologies are expected to support applications such as smart homes and buildings, smart cities, 3D video, work and play in the cloud, remote medical services, virtual and augmented reality, and massive machine-to-machine communications for industry automation. 3G and 4G networks currently face challenges in supporting these services.

These new functionalities and new services necessitate a new way of deploying advanced mobile services, as well as new approaches in making 5G technologies work together in industrial settings by machine-to-machine communications, Internet of Things (IoT) or with connected vehicles. ITU is on the front line of developing standards to allow all of these functionalities to work together.

New Resolutions approved at WRC-19 pointed out that ultra-low latency and very high bit-rate applications of IMT will require larger contiguous blocks of spectrum than those available in frequency bands that had previously been identified for use by administrations wishing to implement IMT.

They also pointed out that harmonized worldwide bands for IMT are desirable in order to facilitate global roaming and the benefits of economies of scale.

Additional bands identified to enable 5G deployment

While identifying the frequency bands 24.25–27.5 GHz, 37–43.5 GHz, 45.5–47 GHz, 47.2–48.2 and 66–71 GHz for the deployment of 5G networks, WRC-19 also took measures to ensure appropriate protection of the Earth-exploration satellite services, including meteorological and other passive services in adjacent bands.

In total, delegates at WRC-19 identified more than 8 times more spectrum for IMT than was identified for IMT before the Conference. 17.25 GHz of spectrum was identified for IMT after the Conference, in comparison with the 1.9 GHz of spectrum identified before WRC-19. Out of this number, 14.75 GHz of spectrum has been harmonized worldwide, reaching 85% of global harmonization.

IMT-2020, the name used in ITU for the standards of 5G, is expected to continue to be developed from 2020 onwards, with 5G trials and commercial activities already underway to assist in evaluating the candidate technologies and frequency bands that may be used for this purpose.

The first full-scale commercial deployments for 5G are expected sometime after IMT-2020 specifications are in force.

ITU will continue to work towards providing stable international regulations, sufficient spectrum and suitable standards for IMT-2020 and the core network to enable successful 5G deployments at the regional and international levels.

Next steps

In parallel, the ITU group responsible for IMT-2020 or 5G is continuing the evaluation of the proposed technologies that will allow network operators to offer 5G performances to their users for the next decade.

This evaluation will be completed in early February 2020 and will be followed by the finalization of the IMT-2020 standards.

ITU will make sure that the standards supporting all 5G applications will be in place in 2020 for the benefit of the entire telecommunication community.

WMO/ Boris Baran

Measures to protect Earth observation for weather prediction

In identifying new frequencies for International Mobile Telecommunications (IMT), WRC-19 established conditions to protect the existing services from receiving harmful interference from future IMT mobile and base stations. Of great importance was the need and priority given to protecting sensitive science services in adjacent bands, particularly the Earth exploration-satellite service (EESS) passive band where measurements are made that are then used in weather prediction models.

Harmful interference into this band could impact these measurements, and make weather prediction increasingly less accurate. WRC-19 protected operations of EESS (passive) in the 23.6–24 GHz by the establishing limits on unwanted emissions for the total radiated power (TRP) of IMT stations.

The limits, specified in Resolution 750 (Rev. WRC-19) on Compatibility between the Earth exploration-satellite service (passive) and relevant active services, are implemented in two steps:

- A limit of –33/–29 dBW/200 MHz applies for base/mobile stations brought into use before 1 September 2027.
- A limit of –39/–35 dBW/200 MHz will apply for base/mobile stations brought into use after 1 September 2027.

Considering the wide disparity in the proposals to the conference on the limits required for protecting the adjacent EESS (passive) band, this two-step approach was the crucial component of the WRC-19 agreement for IMT identification for the 26 GHz band.

The notion of the two-step approach was predicated on the idea that earlier and less-stringent unwanted emission limits would apply in the timeframe when there are expected to be fewer IMT deployments in the 24.25–27.5 GHz band and, therefore, a lower likelihood that the aggregate interference into the EESS (passive) band would be harmful.

The unwanted emission limits will become more stringent after 1 September 2027, in line with the expected increase in the number of IMT Stations operating on or after that date. Additionally, Resolution COM4/8 (WRC-19) on Terrestrial component of International Mobile Telecommunications in the frequency band 24.25–27.5 GHz mandated that:

- the operation of IMT within the frequency band 24.25–27.5 GHz shall protect the existing and future EESS (passive) systems in the frequency bands 23.6–24 GHz;
- the IMT operations in this band are limited to the land mobile service (in other words, IMT shall not operate on aircraft or on ships at sea in this frequency band);
- that administrations shall apply (specified) practical measures to avoid IMT base station antennas pointing in the direction of the spaceborne EESS (passive) sensors.

In addition to the above, WRC-19 took into account that future use and development of the 23.6–24 GHz band for the EESS (passive) systems will be determined by the licensing and regulatory decisions made at the national level. As such, WRC-19 encouraged administrations:

- to ensure that provisions for the implementation of IMT allow for the continued use of EESS, SRS, FSS earth stations and their future development;
- to keep the IMT base stations' antenna patterns within the limits of approximation envelope according to Recommendation ITU-R M.2101;
- when making the 24.25–27.5 GHz frequency band available for IMT, to apply the (more stringent) Category B limits in Recommendation ITU-R SM.329 for spurious emission into the 50.2–50.4 GHz and 52.6–54.25 GHz bands;
- to consider additional mitigation techniques (e.g. guardbands) beyond the limits specified in Resolution 750 (Rev.WRC-19), as appropriate, for the future development of EESS (passive) in the frequency band 23.6–24 GHz.

WRC-19 also took the necessary measures to protect EESS (passive) in the frequency band 36–37 GHz by imposing the unwanted emission limits indicated in Resolution COM4/9 (WRC-19) on IMT stations operating in the band 37–40.5 GHz band.

Finally, WRC-19 invited the ITU-R to *"regularly review, as appropriate, the impact of evolving technical and operational characteristics of IMT systems (including base-station density) and those of systems of space services on sharing and compatibility, and to take into account the results of these reviews in the development and/or revision of ITU-R Recommendations/Reports addressing, inter alia, if necessary, applicable measures to mitigate the risk of interference into space receivers".* These studies will allow a future WRC to take further action, if necessary, to protect the EESS (passive) band in order to help enable accurate weather prediction.

Additional frequency bands for high altitude platform station systems

The ITU Member States agreed to identify additional radio-frequency bands for High Altitude Platform Station (HAPS) systems.

These easily deployable stations operating in the stratosphere (layer of the Earth's atmosphere starting at 20 kilometres) are high enough to provide services to a large area or to augment the capacity of other broadband service providers. Technological innovations in recent years – and the growing urgency to expand the availability of broadband – led to the development of HAPS systems.

The agreements reached at WRC-19 help pave the way to connect more of the world's people to the benefits of today's digital economy, particularly in underserved communities and in rural and remote areas.

A new Resolution passed at WRC-19 also mentioned that "current technologies, such as HAPS, can be used to deliver broadband applications for broadband connectivity and disaster-recovery communications with minimal ground network infrastructure". This can potentially enable lower-cost connectivity and faster deployment.

HAPS systems can be used to provide both fixed broadband connectivity for end users and transmission links between the mobile and core networks for backhauling traffic. Both types of HAPS applications would enable wireless broadband deployment in remote areas, including in mountainous, coastal and desert areas.

HAPS is not a new concept and ITU studies of HAPS began around 1996. Nevertheless, HAPS have become more viable due to the evolution of technology through advances in solar panel efficiency, battery energy density, lightweight composite materials, autonomous avionics and antennas.

Some industries are currently testing the delivery of broadband access via HAPS using lightweight, solar-powered aircraft and airships at an altitude of 20–25 kilometres operating continually for several months.

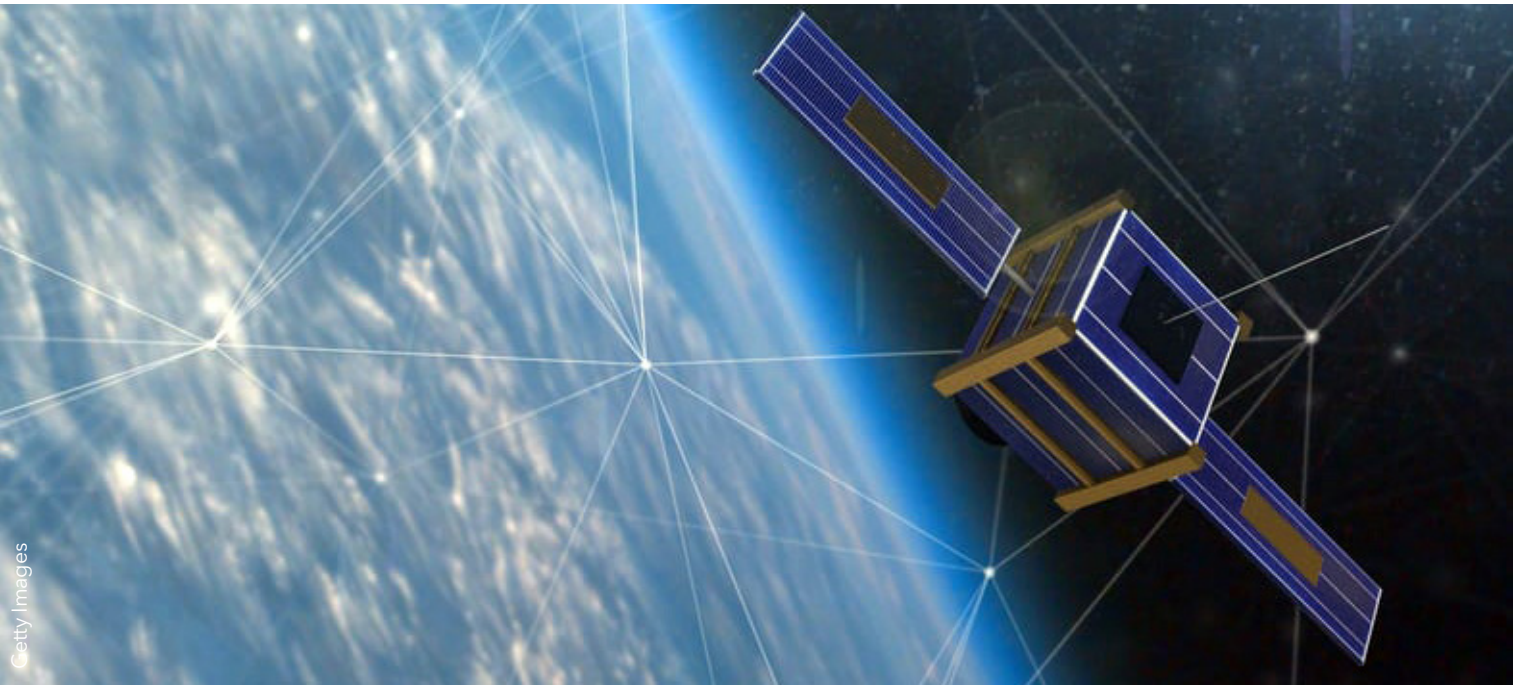
Delegates at WRC-19 agreed that allocations to the fixed service in the frequency bands 31–31.3 GHz, 38–39.5 GHz will be identified for worldwide use by HAPS.

They also confirmed the existing worldwide identifications for HAPS in the bands 47.2–47.5 GHz and 47.9–48.2 GHz are available for worldwide use by administrations wishing to implement high-altitude platform stations.

They agreed to the use of the frequency bands 21.4–22 GHz and 24.25–27.5 GHz by HAPS in the fixed service in Region 2.

They also agreed to limitations regarding link directions, and inclusion of technical conditions of operation of HAPS systems for the protection of other services.

These global and regionally harmonized designations for HAPS will facilitate the development of HAPS services and allow trials to move towards commercial deployments. By approving the spectrum for HAPS, the ITU membership has enabled one more communication platform to connect the unconnected.



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New milestones for non-geostationary satellite deployment

The ITU Member States agreed to adopt an innovative new milestone-based approach for the deployment of non-geostationary satellite (NGSO) systems in specific radio-frequency bands and services.

The agreement reached establishes regulatory procedures for the deployment of NGSOs, including mega-constellations in low-Earth orbit.

Under the newly adopted regulatory regime, these systems will have to deploy 10% of their constellation within 2 years after the end of the current regulatory period for bringing into use, 50% within 5 years, and complete the deployment within 7 years.

The milestone-based approach will provide a regulatory mechanism to help ensure that the Master International Frequency Register reasonably reflects the actual deployment of such NGSO satellite systems in specific radio-frequency bands and services.

It also seeks to strike a balance between the prevention of radio-frequency spectrum warehousing, the proper functioning of coordination mechanisms, and the operational requirements related to the deployment of NGSO systems.

Adapting to satellite industry innovation

The agreement struck in Sharm El-Sheikh reflects the rapid pace of satellite innovation that is driving an increase in the deployment of non-GSO constellations.

Indeed, with the availability of launch vehicles capable of supporting multiple satellite launches, mega-constellations consisting of hundreds to thousands of spacecraft are becoming a popular solution for global telecommunications.

This includes extensive low-latency broadband coverage, remote sensing, space and upper atmosphere research, meteorology, astronomy, technology demonstration and education.

"Advances in satellite design, manufacturing and launch service capabilities have created new possibilities for high-bandwidth connectivity around the world", said Mario Maniewicz, Director of the ITU Radiocommunication Bureau. "This landmark agreement at WRC-19 represents a technological milestone that will enable the deployment of next-generation communications while providing broadband Internet access to the most remote regions".

Increasing satellite filings to ITU

While satellites in geostationary orbit (GSO) are aligned with the Earth's rotation at an elevation of 36 000 km, non-GSO satellites move across the sky during their orbit around the Earth, in medium Earth-orbit (MEO) 8000–20 000 km above the earth and in low-Earth orbit (LEO) at elevations between 400 and 2000 km.

Filings for frequency assignments to NGSO satellite systems composed of hundreds to thousands of satellites have been received by ITU since 2011, in particular in frequency bands allocated to the fixed-satellite service (FSS) or the mobile-satellite service (MSS).

The conference specifically called for further studies by ITU on tolerances for certain orbital characteristics of NGSO space stations of the fixed-satellite, mobile-satellite and broadcasting satellite services as well as for the possible development of post-milestone procedures.


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Spectrum for earth stations in motion

The ITU Member States agreed to a new Resolution that will boost the deployment of earth stations in motion (ESIM).

Earth stations in motion (ESIM) address a complex challenge: how to provide reliable and high-bandwidth Internet services to what are – literally – moving targets. They provide broadband communications, including Internet connectivity, on platforms in motion.

There are currently three types of ESIM: ESIM on aircraft (aeronautical ESIM), ESIM on ships (maritime ESIM) and ESIM on land vehicles (land ESIM). They connect people on ships, aircraft and land vehicles and ensure their safety, security and comfort on the move.

Advances in satellite manufacturing and earth station technology have made ESIM more readily available and more practical.

When ships are at sea or aircraft cross the oceans, they are out of reach of terrestrial networks. ESIM systems can provide a continuous and consistent service with very wide, or literally global, geographic coverage as ships and aircraft operate at or over almost any location.

In addition, the typical data rates currently provided by terminals operating in networks serving ESIM are around 100 Mbit/s. That is much higher, or faster, than those provided historically by the mobile-satellite service (MSS).

It is no surprise, then, that the demand for radio-frequency spectrum that can be used by ESIM is increasing. For example, in 2014, over 20 000 vessels were connected via satellite. This number is expected to increase to around 50 000 vessels over the next few years.

Addressing rising demand

To address the increasing need for radio-frequency spectrum for ESIM, while protecting other services, delegates at WRC-19 decided on the regulatory and technical conditions under which the frequency bands 17.7 19.7 GHz and 27.5–29.5 GHz can be used by ESIM communicating with geostationary-satellite orbit (GSO) space stations in the fixed-satellite service (FSS).

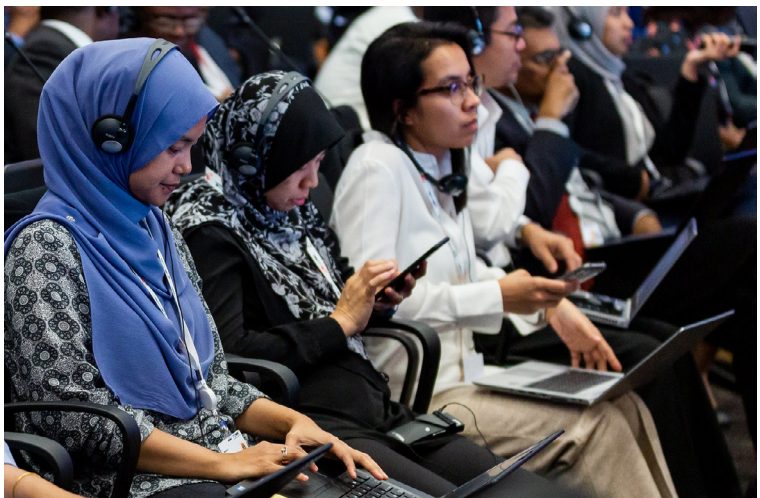
The new Resolution starts by stating that "there is a need for global broadband mobile-satellite communications, and that some of this need could be met by allowing ESIM to communicate with space stations of the GSO FSS operating in the frequency bands 17.7–19.7 GHz (space-to-Earth) and 27.5–29.5 GHz (Earth-to-space)".

However, the Resolution also cautions that the frequency bands 17.7–19.7 GHz (space-to-Earth) and 27.5–29.5 GHz (Earth-to-space) "are also allocated to terrestrial and space services used by a variety of different systems, and these existing services and their future development need to be protected, without the imposition of undue constraints, from the operation of ESIM".

Avoiding harmful interference

In order to strike the right balance between the innovative services that ESIM are providing and the other applications using these frequency bands, the Resolution states that "transmitting aeronautical and maritime ESIM in the frequency band 27.5–29.5 GHz shall not cause unacceptable interference to terrestrial services to which the frequency band is allocated and operating in accordance with the Radio Regulations" and "transmitting land ESIM in the frequency band 27.5–29.5 GHz shall not cause unacceptable interference to terrestrial services in neighbouring countries to which the frequency band is allocated and operating in accordance with the Radio Regulations".

The Resolution ends by instructing the ITU Secretary-General to bring this Resolution to the attention of the Secretary-General of the International Maritime Organization and of the Secretary General of the International Civil Aviation Organization.



Getty Images

Key transportation agreements

The ITU Member States approved international agreements that will help pave the way for better smart-city transportation.

The agreements aim to improve traffic management, public transportation systems, road safety, train safety and railway traffic control – among other aspects of transportation that aim to leverage information and communication technologies (ICTs) to make the world's cities safer and "smarter".

Specifically, delegates representing governments from across the world have approved a new Recommendation on Intelligent Transport Systems (ITS) and a new Resolution on railway radiocommunication systems between train and trackside (RSTT).

Intelligent transport systems

The new ITU Recommendation – "Harmonization of frequency bands for evolving Intelligent Transport Systems applications under mobile service allocations" – starts out by laying out some important context regarding the need to harmonize radio-frequency spectrum for ITS. It mentions the "need to integrate various technologies, including radiocommunications, into land transportation systems".

It also points out that "many new connected vehicles use intelligent technologies in the vehicles' combined advanced traffic management, advanced traveller information, advanced public transportation management systems and/or advanced fleet management systems to improve traffic management".

The new Recommendation also recognizes that "harmonized spectrum and international standards facilitate worldwide deployment of evolving ITS radiocommunications and provide for economies of scale in bringing evolving ITS equipment and services to the public".

The Recommendation urges government administrations to "consider using globally or regionally harmonized frequency bands or parts thereof, as described in the most recent versions of Recommendations (e.g. ITU-R M.2121), when planning and deploying evolving ITS applications".

It also invites ITU Member States and Sector Members to participate actively in and to contribute to ITU Radiocommunication Sector (ITU-R) studies on aspects of ITS and evolving ITS (e.g. connected vehicles, autonomous vehicles, adaptive driver assistance systems), through the ITU-R Study Groups.

Railway radiocommunication systems between train and trackside (RSTT)

The new Resolution – "Spectrum harmonization for railway radiocommunication systems between train and trackside (RSTT) within the existing mobile-service allocation" – starts by establishing the social and economic importance of railway transportation, especially for developing countries.

RSTT refers to radiocommunication systems providing improved railway traffic control, passenger safety and improved security for train operations, says the new Resolution, adding that the main categories of applications of RSTT are train radio, train positioning information, train remote and train surveillance.

The Resolution lays out "that spectrum harmonization of train radio application of RSTT may have priority among the four categories of RSTT applications, because train radio application provides for train dispatching, train control and other important railway services which is used to ensure the safety of train operations and passengers, and require high reliability and high quality of services".

The Resolution also says that the implementation of future RSTT "needs to take account of the development of the railway industry".

In addition, the new Resolution states that "there may be a need to integrate different technologies across multiple bands in order to facilitate various functions, for instance dispatching commands, operating control and data transmission, into railway train and trackside systems to also meet the needs of a high-speed railway environment".

An RSTT Recommendation

The Resolution recognizes that ITU-R is developing a Recommendation to facilitate the spectrum harmonization of current and evolving RSTT.

The Resolution invites ITU-R to continue the development of the Recommendation, in a timely manner, and to "further develop and update ITU-R Recommendations/Reports concerning technical and operational implementation of RSTT, as appropriate".

The Resolution also encourages administrations, when planning for their RSTT, to consider ITU-R study results as well as other relevant ITU-R deliverables, with a view to facilitate spectrum harmonization for RSTT, in particular for train radio application.

It also invites administrations to encourage railway agencies and organizations to utilize relevant ITU-R publications in implementing technologies and systems supporting RSTT.

The resolution also mentions, however, that administrations have flexibility to determine how much spectrum to make available for RSTT as well as the conditions for usage at the national level in order to meet their particular national and/or regional requirements.

It also points out that the technologies for RSTT are evolving and international or regional organizations, such as the 3rd Generation Partnership Project (3GPP), the International Union of Railways (UIC), the European Telecommunications Standards Institute (ETSI), the European Union Agency for Railways (ERA), etc., are developing specifications for technologies and new functions to evolve RSTT.

New resolutions

Committee 4	
COM4/1	Updating provisions related to aeronautical services in the Radio Regulations
COM4/2	Spectrum harmonization for railway radiocommunication systems between train and trackside within the existing mobile service allocations
COM4/3	Use of the frequency band 21.4–22 GHz by high-altitude platform stations in the fixed service in Region 2
COM4/4	Use of the frequency band 24.25–27.5 GHz by high-altitude platform stations in the fixed service in Region 2
COM4/5	Use of the frequency band 31–31.3 GHz by high-altitude platform stations in the fixed service
COM4/6	Use of the frequency band 38–39.5 GHz by high altitude platform stations in the fixed service
COM4/7	Use of the frequency band 66–71 GHz for International Mobile Telecommunications (IMT) and coexistence with other applications of the mobile service
COM4/8	Terrestrial component of International Mobile Telecommunications in the frequency band 24.25–27.5 GHz
COM4/9	Terrestrial component of International Mobile Telecommunications within the frequency bands 37–43.5 GHz and 47.2–48.2 GHz
COM4/10	International Mobile Telecommunications in the frequency band 45.5–47 GHz

Committee 5	
COM5/1	Measures to limit unauthorized uplink transmissions from earth stations
COM5/2	Protection of implemented broadcasting-satellite service networks in the orbital arc of the geostationary-satellite orbit between 37.2° W and 10° E in the frequency band 11.7–12.2 GHz
COM5/3	Additional temporary regulatory measures following the deletion of part of Annex 7 to Appendix 30 (Rev.WRC-15) by WRC-19
COM5/4	Need for coordination of Region 2 fixed-satellite service networks in the frequency band 11.7–12.2 GHz with respect to the Region 1 broadcasting satellite service assignments located further west than 37.2° W and of Region 1 fixed-satellite service networks in the frequency band 12.5–12.7 GHz with respect to the Region 2 broadcasting satellite service assignments located further east than 54° W
COM5/5	Regulatory procedures for frequency assignments to non-geostationary-satellite networks or systems identified as short-duration mission not subject to the application of Section II of Article 9
COM5/6	Use of the frequency bands 17.7–19.7 GHz and 27.5–29.5 GHz by earth stations in motion communicating with geostationary space stations in the fixed-satellite service
COM5/7	A milestone-based approach for the implementation of frequency assignments to space stations in a non-geostationary-orbit satellite system in specific frequency bands and services
COM5/8	Additional measures for satellite networks in the fixed-satellite service in frequency bands subject to Appendix 30B for the enhancement of equitable access to these frequency bands
COM5/9	Use of the frequency band 137–138 MHz by non-geostationary satellites with short-duration missions in the space operation service
COM5/10	Protection of geostationary fixed-satellite service, broadcasting-satellite service, and mobile-satellite service networks from the aggregate interference produced by multiple non-GSO FSS systems in the frequency bands 37.5–39.5 GHz, 39.5–42.5 GHz, 47.2–50.2 GHz and 50.4–51.4 GHz
COM5/11	Application of Article 22 of the Radio Regulations to the protection of geostationary fixed-satellite service and broadcasting-satellite service networks from non-geostationary fixed-satellite service systems in the frequency bands 37.5–39.5 GHz, 39.5–42.5 GHz, 47.2–50.2 GHz and 50.4–51.4 GHz
COM5/12	Use of the frequency bands 37.5–42.5 GHz (space-to-Earth) and 47.2–48.9 GHz, 48.9–50.2 GHz and 50.4–51.4 GHz (Earth-to-space) by non-geostationary satellite systems in the fixed-satellite service and 39.5–40.5 GHz (space-to-Earth) by nongeostationary satellite systems in the mobile-satellite service

Committee 6	
COM6/1	Agenda for the 2023 world radiocommunication conference
COM6/2	Studies on frequency-related matters for the terrestrial component of International Mobile Telecommunications identification in the frequency bands 3300–3400 MHz, 3600–3800 MHz, 6425–7025 MHz, 7025–7125 MHz, and 10.0–10.5 GHz
COM6/3	Studies to consider possible allocation of the frequency band 3600–3800 MHz to the mobile, except aeronautical mobile, service on a primary basis within Region 1
COM6/4	Facilitating mobile connectivity in certain frequency bands below 2.7 GHz using high- altitude platform stations as International Mobile Telecommunications base stations
COM6/5	Consideration of regulatory provisions to facilitate the introduction of sub-orbital vehicles
COM6/6	Studies on a possible new allocation to the aeronautical mobile satellite (R) service within the frequency band 117.975–137 MHz in order to support aeronautical VHF communications in the Earth-to-space and space-to-Earth directions
COM6/7	Review and possible revision of Resolution 155 (Rev.WRC-19) and No. 5.484B in the frequency bands to which they apply
COM6/8	Consideration of regulatory provisions for updating Appendix 27 of the Radio Regulations in support of aeronautical HF modernization
COM6/9	Studies on frequency-related matters, including possible additional allocations, for the possible introduction of new non-safety aeronautical mobile applications
COM6/10	Examination of a possible upgrade to primary status of the secondary allocation to the space research service in the frequency band 14.8–15.35 GHz
COM6/11	Review of frequency allocations for EESS (passive) in the frequency range 231.5–252 GHz and consider possible adjustment according to observation requirements of passive microwave sensors
COM6/12	Operation of earth stations on aircraft and vessels communicating with geostationary space stations in the fixed-satellite service in the frequency band 12.75–13.25 GHz (Earth-to-space)
COM6/13	Use of the frequency bands 17.7–18.6 GHz and 18.8–19.3 GHz and 19.7–20.2 GHz (space-to-Earth) and 27.5–29.1 GHz and 29.5–30 GHz (Earth-to-space) by earth stations in motion communicating with non-geostationary space stations in the fixed-satellite service
COM6/14	Study of technical and operational issues, and regulatory provisions for satellite to-satellite links in the frequency bands 11.7–12.7 GHz, 18.1–18.6 GHz, 18.8–20.2 GHz and 27.5–30 GHz
COM6/15	Studies relating to spectrum needs and potential new allocations to the mobile satellite service in the frequency bands 1695–1710 MHz, 2010–2025 MHz, 3300–3315 MHz and 3385–3400 MHz for future development of narrowband mobile-satellite systems

COM6/16	Primary allocation to the fixed-satellite service in the space-to-Earth direction in the frequency band 17.3–17.7 GHz in Region 2
COM6/17	Studies on technical and operational measures to be applied in the frequency band 1240–1300 MHz to ensure the protection of the radionavigation-satellite service (space-to-Earth)
COM6/18	Use of International Mobile Telecommunication systems for fixed wireless broadband in the frequency bands allocated to the fixed service on primary basis
COM6/19	Preliminary agenda for the 2027 world radiocommunication conference*
COM6/20	New allocations for the radiolocation service in the frequency band 231.5–275 GHz, and new identification for radiolocation service applications of frequency bands in the range 275–700 GHz
COM6/21	Use of the frequency bands 37.5–39.5 GHz (space-to-Earth), 40.5–42.5 GHz (space-to- Earth), 47.2–50.2 GHz (Earth-to-space) and 50.4–51.4 GHz (Earth-tospace) by aeronautical and maritime earth stations in motion communicating with geostationary space stations in the fixed-satellite service
COM6/22	Studies relating to spectrum needs and possible allocation of the frequency band 43.5–45.5 GHz to the fixed-satellite service
COM6/23	Sharing between stations in the fixed service and satellite services in the frequency bands 71–76 GHz and 81–86 GHz
COM6/24	Conditions for the use of the frequency bands 71–76 GHz and 81–86 GHz by stations in the satellite services to ensure compatibility with passive services
COM6/25	Studies of technical, operational issues and regulatory provisions for non-geostationary fixed-satellite service satellite system feeder links in the frequency bands 71–76 GHz (space-to-Earth and proposed new Earth-to-space) and 81–86 GHz (Earth-to-space)
COM6/26	Study of technical and operational matters, and regulatory provisions, for space-to-space transmissions in the Earth-to-space direction in the frequency bands [1610–1645.5 and 1646.5–1660.5 MHz] and space-to-Earth direction in the frequency bands [1525–1544 MHz], [1545–1559 MHz], [1613.8–1626.5 MHz] and [2483.5–2500 MHz] among non-geostationary and geostationary satellites operating in the mobile-satellite service
COM6/27	Studies on possible allocations to the land mobile service (excluding IMT) in the frequency band 1300–1350 MHz for use by administrations for the future development of terrestrial mobile-service applications
COM6/28	Considerations to improve the utilization of the VHF maritime frequencies in Appendix 18
COM6/29	Use of the frequency band 22.55–23.15 GHz by the Earth exploration-satellite service (Earth-to-space)
COM6/30	Removal of the limitation regarding aeronautical mobile in the frequency range 694–960 MHz for user equipment non-safety International Mobile Telecommunications applications

WRC-19 declaration

Promoting gender equality, equity and parity in the ITU Radiocommunication Sector

1. Gender balance in all radiocommunication activities
2. An annual review on the gender mainstreaming progress
3. A Radiocommunication Assembly 2023 resolution

Increasing numbers of:

1. Women pursuing degrees in STEM fields
2. Girls in STEM primary/secondary education
3. STEM scholarships and fellowships provided to women
4. ICT internships/training opportunities for women

Encouraging and actively supporting:

5. Education and professional careers in ICT for girls and women

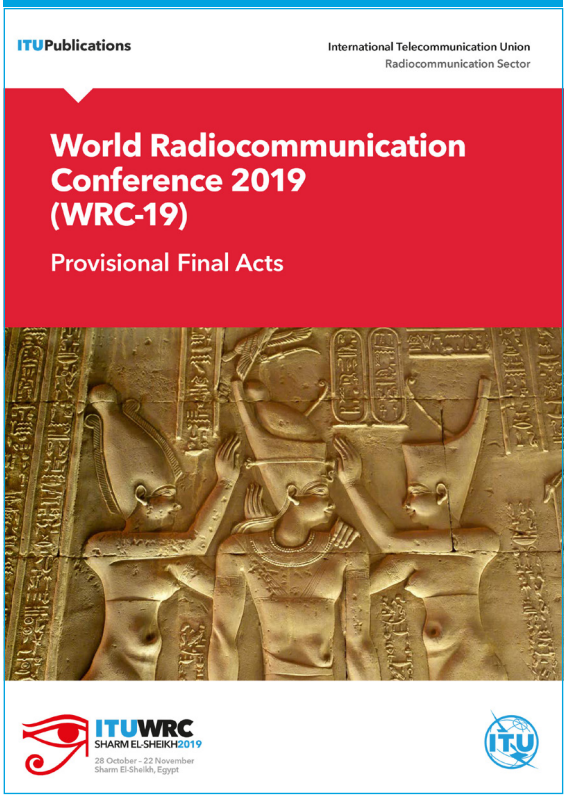
Conclusions

At the closing ceremony, ITU Secretary-General Houlin Zhao said that WRC-19 had paved the way for new, more innovative ways to connect the world using both terrestrial and space-based communication technologies. "As leading edge broadband technology manifests itself in new industrial developments, people in the remotest areas will also get better and more affordable access", he said.

"The hard won agreements at WRC-19 will favourably impact the lives of billions of people around the world, creating a digital landscape for sustainable growth and development", said Mr Mario Maniewicz, Director of the ITU Radiocommunication Bureau. "The achievements of WRC-19 in enabling new communication technologies and the protection of existing services will be reflected in the continuous growth of the trillion dollar telecommunication and ICT industry".

In his closing remarks, the Chairman of WRC-19, Amr Badawi said: "This is a highly sensitive international treaty and, of course, a very important one. Modifying these regulations required enormous cooperation between the different participants of this conference". The Chairman thanked the delegates for their excellent spirit demonstrated which had allowed for final consensus, and hoped that the results would mark the beginning of a new technological era to the service of innovation, and of peace.

Download the Provisional Final Acts to see all WRC-19 outcome documents here.



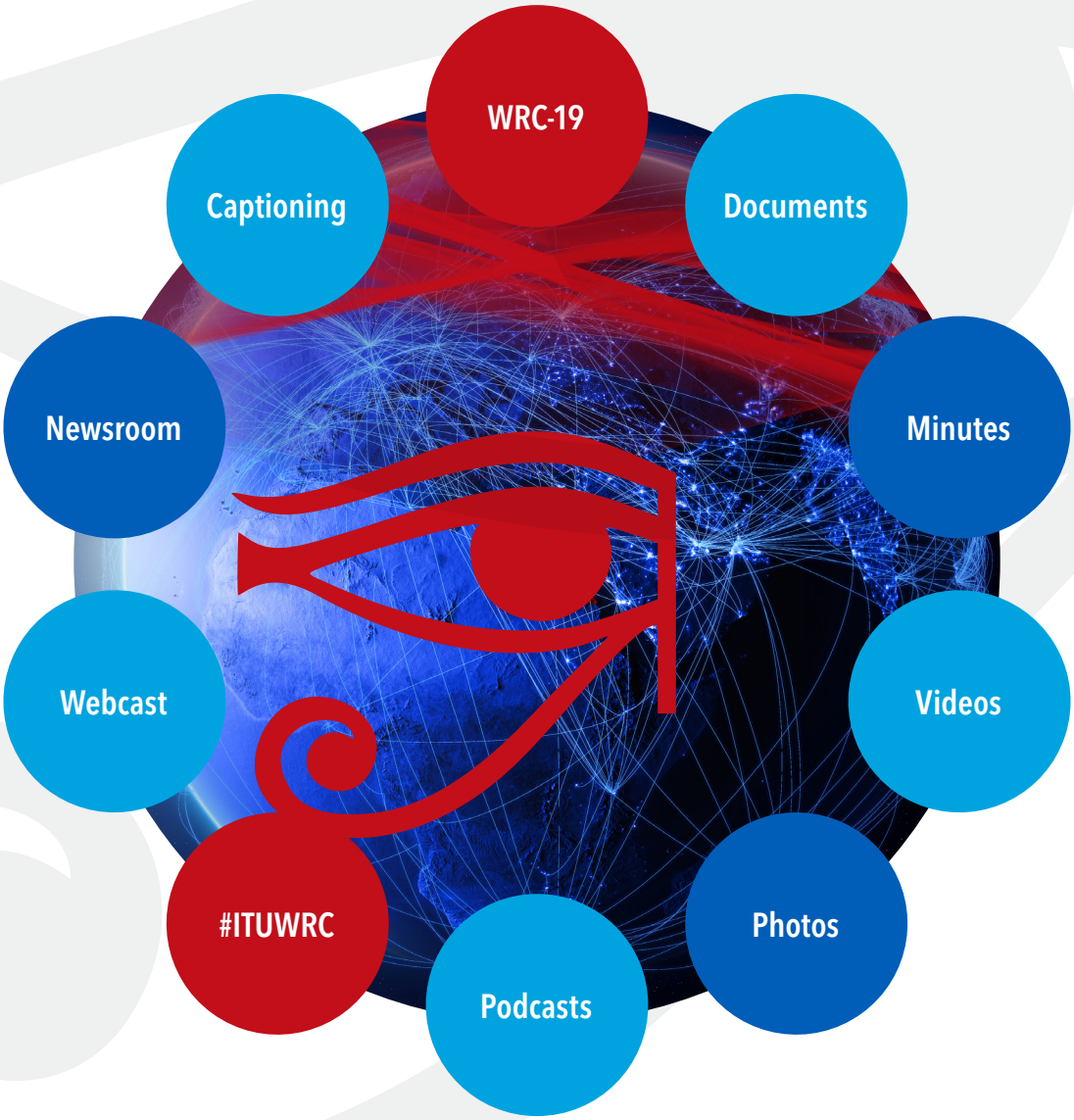
Amr Talaat, Egypt's Minister of Communications and Information Technology, was pleased to declare the launching of Egypt's first satellite – a major milestone for the country.

The satellite, he said "will provide services to governmental institutions and the private sector, … and ensure the infrastructure for wideband Internet for remote and isolated areas".

The 38th World Radiocommunication Conference (WRC), held in Sharm El-Sheikh, Egypt, from 28 October to 22 November 2019, closed with the signing of the Final Acts. The conference, hosted by the Government of Egypt, attracted over 3400 participants.

The updated Radio Regulations will be published during the course of 2020, and will come into effect on 1 January 2021.

WRC-19 at a glance



ITU News Magazines dedicated to WRC-19:

Looking ahead to WRC-23

The WRC-19 established the general scope of the agenda for the World Radicommunication Conference 2023 (WRC-23). This sets the stage for the development of future technologies and guides the work of the ITU Radiocommunication Sector (ITU-R) during the next four-year study cycle.

The agenda items proposed by ITU Member State administrations that could not be included in the agenda of WRC-23, have been deferred to the preliminary agenda of WRC-27.

The preliminary agenda for WRC-23

1.1 Aeronautical and maritime mobile services: consider protection of stations located in international airspace and waters from other stations located within national territories.

1.2 International Mobile Telecommunications (IMT): consider additional allocations to the mobile service and identification of frequency bands for IMT.

1.3 Mobile service within Region 1: consider additional primary allocation of the band 3600–3800 MHz.

1.4 High altitude platform stations as IMT base stations (HIBS): consider the use HIBS in the mobile service in certain frequency bands already identified for IMT.

1.5 Review the spectrum use and spectrum needs of existing services in the frequency band 470–960 MHz in Region 1: consider possible regulatory actions in the frequency band 470–694 MHz in Region 1.

1.6 Sub-orbital vehicles: consider regulatory provisions to facilitate radiocommunications for sub-orbital vehicles.

1.7 Aeronautical mobile-satellite (R) service (AMS(R)S): consider a new allocation for both the Earth-to-space and space-to-Earth directions of aeronautical VHF communications.

1.8 Unmanned aircraft systems: accommodate the use of fixed-satellite service (FSS) networks by control and non-payload communications of unmanned aircraft systems.

1.9 Digital technologies for commercial aviation safety-of-life applications: consider appropriate regulatory actions and updates to accommodate these technologies in existing HF bands allocated to the aeronautical mobile (route) service.

1.10 Aeronautical mobile service for the use of non-safety aeronautical mobile applications: consider possible new allocations for these services.

1.11 Global Maritime Distress and Safety System: consider regulatory actions for the modernization of these systems and the implementation of e-navigation.

1.12 Earth exploration-satellite (active) service for spaceborne radar sounders: consider a possible new secondary allocation.

1.13 Space research service: consider a possible upgrade of the allocation of the frequency band 14.8-15.35 GHz to these services.

1.14 EESS (passive): consider possible adjustments to ensure alignment with more up-to-date remote-sensing observation requirements.

1.15 Earth stations on aircraft and vessels communicating with geostationary space stations in the fixed satellite service: consider global harmonization.

1.16 Non-GSO FSS earth stations in motion: develop technical, operational and regulatory measures, to facilitate the use of space-to-Earth and Earth-to-space frequency bands.

1.17 Intersatellite links: consider adding an inter-satellite service allocation, where appropriate.

1.18 Mobile-satellite service: consider spectrum needs and potential new allocations for future development of narrowband mobile-satellite systems.

1.19 Fixed-satellite service in the space-to-Earth direction: consider a new primary allocation for these services in Region 2.

The preliminary agenda for WRC-27

2.1 Radiolocation service: consider additional spectrum allocations and identification for radiolocation applications for millimetre and sub-millimetre wave imaging systems

2.2 Aeronautical and maritime earth stations in motion communicating with geostationary space stations in the fixed satellite service: develop technical, operational and regulatory measures to facilitate the use of the frequency bands by these stations.

2.3 Fixed-satellite service: consider the allocation of frequency bands to this service.

2.4 Article 21: introduce pfd and e.i.r.p. limits for the frequency bands 71–76 GHz and 81–86 GHz.

2.5 Satellite services: define conditions for stations in the satellite service to ensure compatibility with passive services.

2.6 Space weather sensors: consider regulatory provisions for appropriate recognition and protection of these sensors.

2.7 Non-geostationary fixed satellite system feeder links: consider the development of regulatory provisions for space-to-Earth and Earth-to-space communications.

2.8 Space-to-space links: study the technical and operational matters, and regulatory provisions, among non-geostationary and geostationary satellites operating in the mobile-satellite service.

2.9 Mobile service: consider possible additional spectrum allocations to facilitate the future development of mobile-service applications.

2.10 VHF maritime: consider improving the utilization of the frequencies in Appendix 18.

2.11 EESS (Earth-to-space): consider a new allocation for this service.

2.12 IMT identification: consider the removal of the limitation regarding aeronautical mobile in the IMT for the use of IMT user equipment by non-safety applications.

2.13 Mobile satellite service: consider a possible worldwide allocation for the future development of narrowband mobile-satellite systems.

Participants at the Network of Women for WRC-19 Reception, Sharm El-Sheikh, Egypt, 28 October to 22 November 2019.

Promoting gender equality at WRC-19

Gender equality was a hot topic at this year's WRC. The statistics on male and female delegates was a stark reminder that there is still a lot of work to do, and WRC-19 stepped up in encouraging more gender equality throughout the Union.

Interview with Cindy-Lee Cook (right), Deputy Head, Canadian Delegation, Chair, Ad hoc Group of the Plenary, WRC-19 and Luciana Camargos, Brazilian Delegate, WRC-19, Co-Chair, Network of Women (NOW) at WRC-19.

The ITU Network of Women (#NOW4WRC19)

The NOW4WRC19 initiative started building capacity early on in the World Radiocommunication Conference (WRC) process to encourage a larger participation of women as delegates, chairs, vice-chairs, etc., at WRC-19.

Its main objectives are to achieve gender balance among delegates; to prepare women delegates in key roles for WRC-19; and to grow the ITU women's community, capacity and contribution.

Although the number of women delegates at WRC was low (only 18%), the Network of Women proved to be highly positive at WRC-19, and resulted in an adopted declaration.

See video interview to learn more.

WRC-19 declaration for gender equality

WRC-19 adopted a declaration that promotes gender equality, equity and parity in the work of the ITU Radiocommunication Sector.

ITU Member States and Sector Members declared they will urgently undertake active measures to increase the number of girls receiving primary and secondary education in advanced mathematics and science in preparation for undergraduate degrees in STEM fields, particularly in electrical engineering and computer science.

They also agreed to increase the number of scholarships and fellowships provided to women pursuing academic degrees at all levels in STEM fields and, by 2023, to substantially increase the number of internships, training opportunities and summer jobs available for women to prepare them for professional careers and leadership positions in the telecommunications/ICT sector.

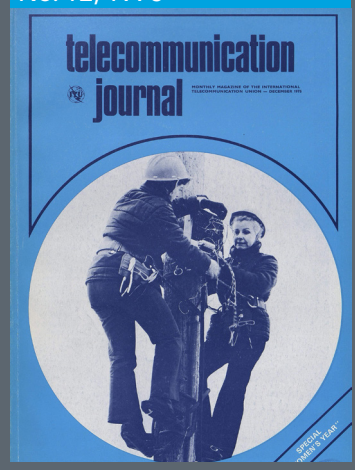
"Society as a whole will benefit from the participation of women in technology development, policy-making and decision-making", said Houlin Zhao, ITU Secretary-General, urging Member States and Sector Members to include women in all aspects of ITU-related activities.

"The ITU Network of Women, initiated by the Radiocommunication Bureau, is dedicated to promoting women in radiocommunications, telecommunications/ICT and related fields to enhance the inclusion of women and girls in the information society and to help meet the UN Sustainable Development Goal on achieving gender equity", said Mario Maniewicz, Director of the ITU Radiocommunication Bureau. He emphasized that everyone has a role to play in ensuring that women and men can compete on a level playing field for opportunities in the ICT environment, and especially in radiocommunications.

From the archives

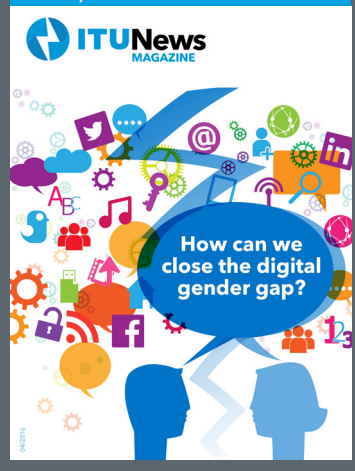
Take a look into the archives at some of the past editions dedicated to women and girls in the information and communication technology sector and bridging the digital gender gap.

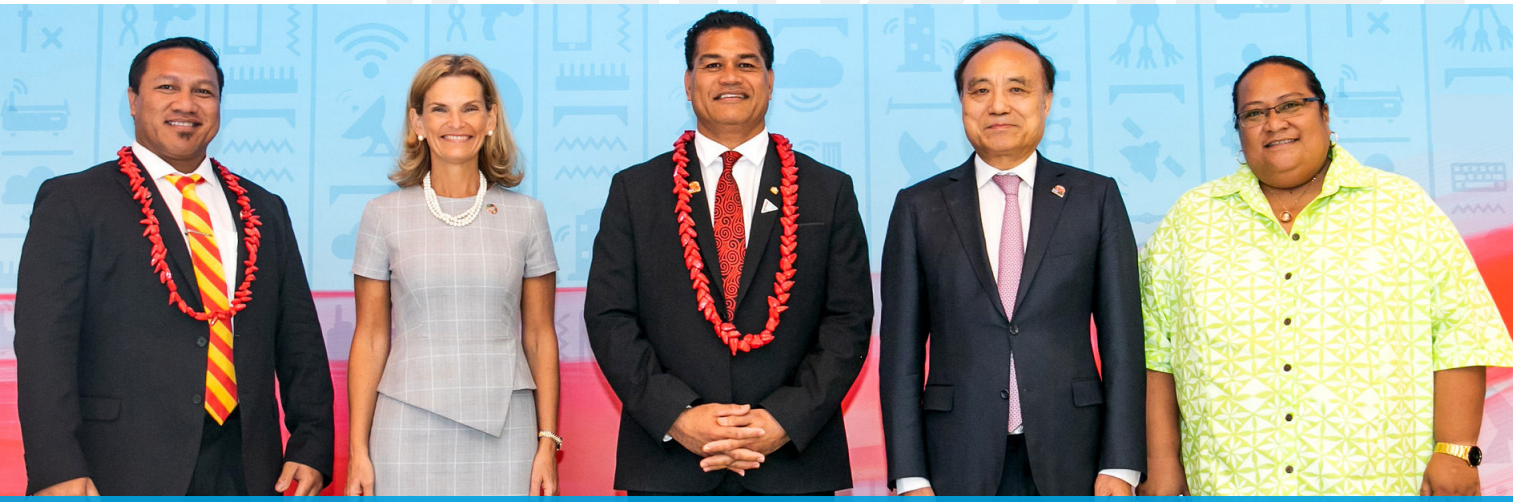
No. 12, 1975



No. 3, 2013

No. 4, 2016





From left to right: Mr Talatalaga Fualau Mata'u Matafeo, CEO, Ministry of Communications and Information Technology of Samoa; Ms Doreen Bogdan-Martin, Director, ITU Telecommunication Development Bureau; His Excellency Mr Afamasaga Lepuia'i Rico Tupai, Minister of Communications and Information Technology of Samoa; Mr Houlin Zhao, ITU Secretary-General; and Ms Lefaoali'i Unutoa Auelua-Fonoti, Regulator, Office of the Regulator of Samoa, at the 38th World Radiocommunication Conference on 1 November 2019 in Sharm El-Sheikh, Egypt.

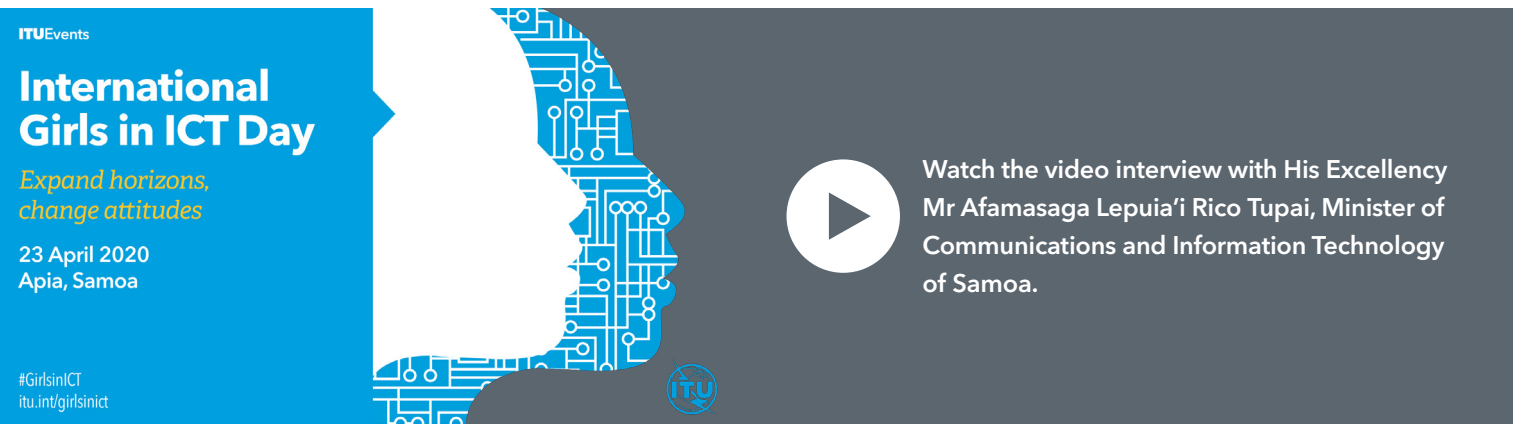
Samoa to host Girls in ICT Day 2020

ITU's annual global Girls in ICT Day celebration will be held next year on 23 April in the Independent State of Samoa.

With the theme "Expand horizons, change attitudes", the event is expected to welcome some 1000 local school-age girls from Samoa and abroad for a day of fun, interactive tech workshops, talks by industry experts, and high-level discussions around ways to boost regional capacity building for digital skills development.

The global event in Apia will also feature winners from national competitions across the region.

"By bringing next year's global celebration to Samoa, ITU shows our commitment to pressing for progress for gender equality everywhere, including in Small Island Developing States and Landlocked Developing Countries", said ITU Secretary-General, Houlin Zhao.



Shutterstock

About World TV Day

The United Nations General Assembly proclaimed 21 November as World Television Day in 1996 in recognition of the increasing impact television has on decision making. It brings world attention to threats to peace and security and has a potential role in sharpening the focus on other key areas, including economic, environmental and social issues.

ITU marks 70 years of television standards work

During the World Radiocommunication Conference 2019, on 21 November, World Television Day, ITU marked 70 years of television standards work.

ITU, since it first released technical standards for television 70 years ago in 1949, has developed the globally harmonized standards that have progressively enhanced television viewing experience in terms of both visual and audio quality.

As 5G services complying with ITU's IMT-2020 spectrum allocations and standards, which were being addressed by WRC-19, in Sharm El-Sheikh, Egypt, are progressively rolled out over the coming years, the convergence of traditional broadcasting and Internet services could lead to the further merging of media content, data, and applications using broadband networks delivered over a combination of terrestrial, satellite and Internet platforms. These "Global Platforms" may one day facilitate delivery of content to end-users on a wide range of devices and receiving platforms, using both broadcasting and non-broadcasting technologies.

"Television plays a crucial role in connecting the world to information and knowledge while providing an unsurpassed channel for mass entertainment", said ITU Secretary-General Houlin Zhao.

"World TV Day focuses on the work of ITU over the last 70 years in developing new standards and systems for broadcasting, bringing them in line with the latest cutting edge technologies designed to make high quality television coverage available in affordable ways to people in the remotest areas of the world", said Mr Mario Maniewicz, Director of the ITU Radiocommunication Bureau.

In 2012, ITU received the Emmy Award from the US National Academy of Television Arts & Sciences for the "Standardization of Loudness Metering for Use in Broadcast Audio" to balance the loudness within and between broadcast programmes.

ITU's standards for video coding in collaboration with ISO and IEC also received two Primetime Emmy Awards from the Academy of Television Arts & Sciences, the first in 2008 for ITU H.264 | MPEG-4 Advanced Video Coding (AVC) and the second in 2017 for High Efficiency Video Coding (HEVC, published as ITU H.265 | ISO/IEC 23008-2).

The Versatile Video Coding (VVC) project, now on course for completion by mid-2020, aims to provide significant improvements, saving up to 37.7 per cent in compression performance over HEVC.

See interview with David Wood of the European Broadcasting Union (EBU) for insights into new trends and directions on the future of TV broadcasting.

From the archives

World Cup 2010 in 3D TV Testing new technology

As one of the most popular sporting events in the world, the World Cup is watched by billions of people, thanks to the standards ("Recommendations") for television formats agreed in ITU's Radiocommunication Sector (ITU-R). These have made possible digital television and high-definition television (HDTV).

According to a past ITU report, by the end of 2009, there were some 1.4 billion households around the world with a television, providing some five billion people access to a television at home (see full article).

Follow the story of ITU's work. Watch the ITU Historical Video.

Nick Fewings/unsplash

New tools for connecting rural citizens

During WRC-19 ITU launched a new toolkit to support regulators and policymakers everywhere in their efforts to bring broadband networks and access to all.

Putting in place the right regulatory arrangements, connectivity measures and appropriate tools to foster infrastructure deployment, particularly in rural and remote areas, is vital to promoting full digital inclusion through universal access to fast, reliable online technologies and services.

The new toolkit offers regulators and policymakers a clear and practical methodology for the accurate economic evaluation of proposed broadband infrastructure installation and deployment plans. The expert guidance offered aims to greatly facilitate the development of a credible and coherent business plan that is adaptable to a wide range of broadband infrastructure deployment projects.

Read the article.
Download the toolkit here.

Celebrating 150 years of ITU News

On 25 November 2019, the ITU's flagship publication reached 150 years of age.

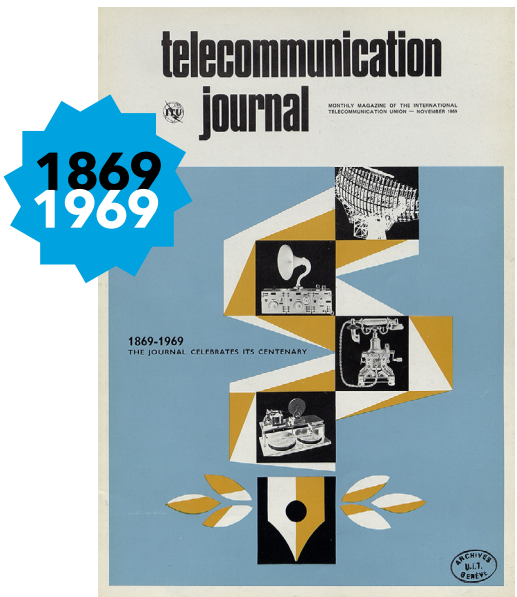
The ITU News Magazine began as the *Journal Télégraphique* in 1865, and in this section you will see how it has evolved and changed over the years to become the multilingual, digital only magazine that it is today.

Indeed, the publication's 100th and 120th anniversaries were also marked, within the editions featured below.

By delving into the earlier, as well as the recent editions, we can learn about the very rich history, not only of ITU and its activities, including outcomes of conferences, but also that of the information of the global telecommunication/information and communication technology (ICT) sector as a whole.

Read on for the ITU News Magazine's important milestones over the past 150 years.

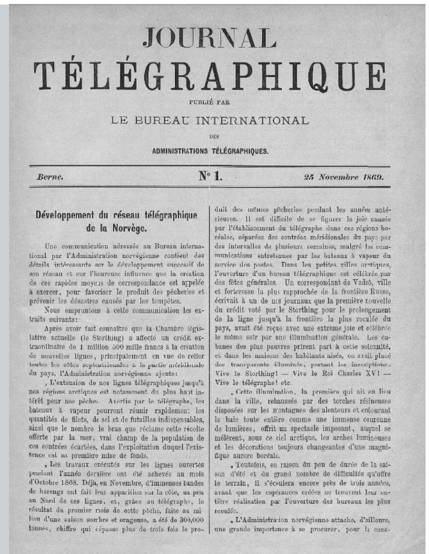
Throughout this edition you will have seen a few elements from the archives that are interestingly still very relevant to the discussions in the global ICT sector today.



See ITU's journals through the ages from 1869…

1869 The first issue of the *"Journal télégraphique"* is published

Following the signing of the first International Telegraph Convention in Paris on 17 May 1865, which established ITU, the second International Telegraph Conference, held in Vienna in 1868, decided to establish a permanent secretariat for the Union in Bern, Switzerland. Among the six tasks assigned to the Bureau was the publication of "a telegraph journal in the French language" (International Telegraph Convention (Vienna, 1868), Article 61). Thus, the publication of the Journal was mandated by Member States and has been an important part of ITU's role to disseminate information right from the creation of the secretariat. The first issue of the *"Journal télégraphique"* was published on 25 November 1869.



JOURNAL
TÉLÉGRAPHIQUE
PUBLIÉ PAR
LE BUREAU INTERNATIONAL
DES
ADMINISTRATIONS TÉLÉGRAPHIQUES.

Berne. — Nº 1. — *25 Novembre 1869.*

Développement du réseau télégraphique de la Norvège.

Une communication adressée au Bureau international par l'Administration norvégienne contient des détails intéressants sur le développement successif de son réseau et sur l'heureuse influence que la création de ces rapides moyens de correspondance est appelée à exercer, pour favoriser le produit des pêcheries et prévenir les désastres causés par les tempêtes.

Nous empruntons à cette communication les extraits suivants:

Après avoir fait connaître que la Chambre législative actuelle (le Storthing) a affecté un crédit extraordinaire de 1 million 500 mille francs à la création de nouvelles lignes, principalement en vue de relier toutes les côtes septentrionales à la partie méridionale du pays, l'Administration norvégienne ajoute:

„L'extension de nos lignes télégraphiques jusqu'à nos régions arctiques est notamment du plus haut intérêt pour nos pêches. Avertis par le télégraphe, les bateaux à vapeur pourront réunir rapidement les quantités de filets, de sel et de futailles indispensables, ainsi que le nombre de bras que réclame cette récolte offerte par la mer, vrai champ de la population de ces contrées écartées, dans l'exploitation duquel l'existence est sa première mise de fonds.

„Les travaux exécutés sur les lignes ouvertes pendant l'année dernière ont été achevés au mois d'Octobre 1868. Déjà, en Novembre, d'immenses bandes de harengs ont fait leur apparition sur la côte, un peu au Nord de ces lignes, et, grâce au télégraphe, le résultat du premier mois de cette pêche, faite au milieu d'une saison sombre et orageuse, a été de 300,000 tonnes, chiffre qui dépasse plus de trois fois le produit des mêmes pêcheries pendant les années antérieures. Il est difficile de se figurer la joie causée par l'établissement du télégraphe dans ces régions boréales, séparées des contrées méridionales du pays par des intervalles de plusieurs semaines, malgré les communications entretenues par les bateaux à vapeur du service des postes. Dans les petites villes arctiques, l'ouverture d'un bureau télégraphique est célébrée par des fêtes générales. Un correspondant de Vadsö, ville et forteresse la plus rapprochée de la frontière Russe, écrivait à un de nos journaux que la première nouvelle du crédit voté par le Storthing pour le prolongement de la ligne jusqu'à la frontière la plus reculée du pays, avait été reçue avec une extrême joie et célébrée le même soir par une illumination générale. Les cabanes des plus pauvres prirent part à cette solennité, et dans les maisons des habitants aisés, on avait placé des transparents illuminés, portant les inscriptions: Vive le Storthing! — Vive le Roi Charles XV! — Vive le télégraphe! etc.

„Cette illumination, la première qui ait eu lieu dans la ville, rehaussée par des torches résineuses disposées sur les montagnes des alentours et entourant la baie toute entière comme une immense couronne de lumières, offrit un spectacle imposant, auquel se mêlèrent, sous ce ciel arctique, les arches lumineuses et les décorations toujours changeantes d'une magnifique aurore boréale.

„Toutefois, en raison du peu de durée de la saison d'été et du grand nombre de difficultés qu'offre le terrain, il s'écoulera encore près de trois années, avant que les espérances créées ne trouvent leur entière réalisation par l'ouverture des bureaux les plus reculés.

„L'Administration norvégienne attache, d'ailleurs, une grande importance à se procurer, pour la cons-

No. 1, 1869

1934 The journal changes its name to: *"Journal des télécommunications"*

In 1932, the International Telegraph Conference and the International Radiotelegraph Conference in Madrid decided to combine the Telegraph and Radiotelegraph Conventions to form the single International Telecommunication Convention. At the same time, a new name was adopted to reflect the full range of ITU's responsibilities: International Telecommunication Union. The new name came into effect on 1 January 1934. Accompanying the change of name of the Union, the *Journal télégraphique* became the *Journal des télécommunications* on 1 January 1934.

Pages 1 à 32. — Nº 1. — Janvier 1934.

JOURNAL DES TÉLÉCOMMUNICATIONS
PUBLIÉ PAR LE BUREAU DE L'UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS

Pour les abonnements, LES ANNONCES et tout ce qui se rapporte à la rédaction, s'adresser au Bureau de l'Union internationale des télécommunications, Berne (Suisse).

No. 1, 1934

See ITU's journals through the ages from 1869…

1948 The journal is published in three languages: English, French and Spanish

Following the decisions of the International Telecommunication Conference of Atlantic City (1947) related to languages, the Telecommunication Journal became a trilingual publication (English, French and Spanish) starting in January 1948. The three languages were printed side-by-side on the same page. Publishing the Journal in its new format meant a considerable increase in work and in cost of production.


JOURNAL DES TÉLÉCOMMUNICATIONS
TELECOMMUNICATION JOURNAL
BOLETIN DE TELECOMUNICACIONES

PUBLIÉ MENSUELLEMENT PAR LE BUREAU DE L'UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS

PUBLISHED MONTHLY BY THE BUREAU OF THE INTERNATIONAL TELECOMMUNICATION UNION

PUBLICADO MENSUALMENTE POR LA OFICINA DE LA UNIÓN INTERNACIONAL DE TELECOMUNICACIONES

Nº 1

JANVIER - JANUARY - ENERO 1948

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BERNE (SUISSE) - EFFINGERSTRASSE 1 - TÉL. (031) 21 7 62

No. 1, 1948

1962 Each language has its own separate edition

Publication of the Journal in three separate English, French and Spanish editions, instead of the old trilingual form, began in January 1962.

From the 1960s to the 1980s, the journal was increasingly used to spread information about the Union and its work. Part of this strategy consisted of sending copies of the Journal to the United Nations and all its specialized agencies as well as to the United Nations Information Centres in various parts of the world and to the Union's Technical Cooperation experts in the field. In addition, an increasing number of organs of the general and technical press asked to receive it.

No. 1, 1962

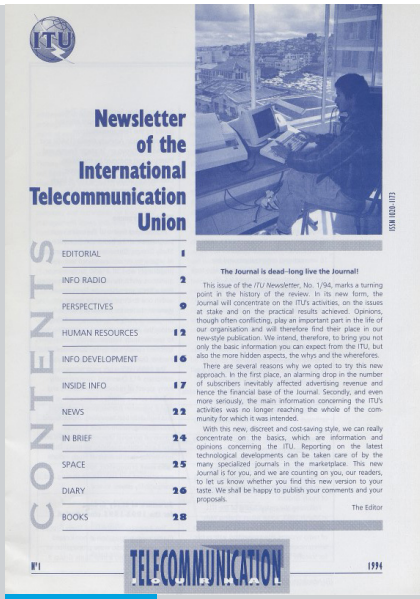
French

Spanish

See ITU's journals through the ages from 1869…

1994 The journal becomes a newsletter

In January 1994, the Telecommunication Journal was replaced by the "ITU Newsletter". The layout was modified and modernized, and the production schedule was changed to ten times a year. It was announced that, in its new form, the Journal/Newsletter would "concentrate on ITU's activities, on the issues at stake and on the practical results achieved". Opinions, though often conflicting, would also find their place in the new style publication in order to provide readers with not only the basic information about ITU activities, but also "the more hidden aspects, the whys and the wherefores".



No. 1, 1994

- French
- Spanish

1996 ITU News takes the form of a magazine

Starting with the first issue of 1996, the journal had a new look with a streamlined formula. The more manageable title was changed to be in line with the publication's real business: *ITU News*. The format and layout was improved, and room was allocated for advertising. In the rapidly expanding telecommunication world, there were plenty of topics to cover, such as mobile personal communications, multimedia, or new forms of cooperation for telecommunication development in developing countries. By evolving in this way, *ITU News* was adapting to the changes which occurred in the Union since the Kyoto Plenipotentiary Conference.

No. 1, 1996

- French
- Spanish

See ITU's journals through the ages from 1869…

1999 An electronic version and fee-paying subscribers

As part of the response to a study that showed a need for electronic distribution of information about ITU activities, the first electronic version of the ITU News Magazine appeared on the ITU website in mid-1999. From then onwards ITU News appeared in both digital and paper copies. In 2003–2006, the ITU News website was a high achiever in terms of average number of visits per month, scoring among the top three most visited ITU sites. From 1999 the printed version became fee paying for non-ITU members. Fee-paying subscribers paid 100 CHF per year, and subscribers included a number of bookshops and private-sector companies.

No. 1, 1999

- French
- Spanish

2009 The ITU News Magazine is published in 6 languages

Since July 2009, at the request of ITU Member States, to enhance the Union's image and the effectiveness of its public information work, the ITU News Magazine has been published in all six official languages of the Union (Arabic, Chinese, English, Spanish, French and Russian). It continues to provide wide-ranging coverage of ITU activities and events shaping telecommunications/information and communication technologies around the world.

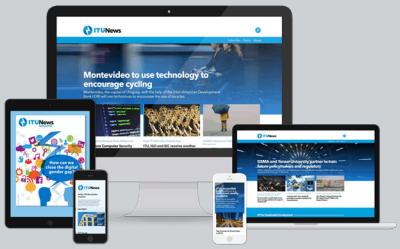
No. 6, 2009

- French
- Spanish
- Arabic
- Chinese
- Russian

See ITU's journals through the ages from 1869…

2016 The ITU News Magazine goes digital

In 2016, the ITU News Magazine became entirely digital, with a new online portal. Digital editions produced around key ITU events and topics throughout the year are now widely distributed by e-mail newsletter.



Two sister products were also introduced: A mobile-friendly ITU News website publishing daily articles on how the latest ICT trends will impact sustainable development worldwide, and the ITU News weekly newsletter – distributed to your inbox, every Tuesday.

Also in 2016, after a long arduous task, the ITU Library and Archives Service launched a digitized historical collection of ITU News, from 1869. The complete collection is searchable, and you can explore information about the development of the telecommunications/information and communication technology sector, and ITU's activities, over the years.
See ITU's journals through the ages from 1869…

No. 1, 2016

French · Arabic · Spanish · Chinese · Russian

ITU News
WEEKLY

Stay current.
Stay informed.

The weekly ITU Newsletter keeps you informed with:

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- Insights from ICT Thought Leaders
- The latest on ITU events and initiatives

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