INTERNATIONAL AFFAIRS

МЕЖДУНАРОДНАЯ ЖИЗНЬ

Радио

Стандартизация

Development

RUSSIA

and

ITU

TV

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RUSSIA AND THE ITU EVOLUTION

On May 17, 1865, European states then in possession of telegraph networks instituted in Paris the International Telegraph Union (Union internationale du télégraphe), one of the oldest international organizations. Among its members were Russia, France, Austria, Belgium, Denmark, Spain, Portugal, Greece, Italy, Sweden, Norway, Switzerland, Turkey, the Netherlands, Prussia, the Free and Hanseatic City of Hamburg, the Kingdom of Hanover, Bavaria, the Grand Duchy of Baden, the Duchy of Saxe-Hildburghausen, and the Kingdom of Wurttemberg. The only country that shunned the high assembly was Great Britain; British telegraph networks were privately owned, and their private owners fiercely opposed any tariff regulations.

As the technological standards of electric communications developed, the International Telegraph Union was renamed the International Telecommunication Union, and in 1947 it became a specialized UN establishment.

In 1992, the ITU makeup was altered. There appeared three specialized sectors within the Union, each with its own functions.

Radio communication (**ITU-R**);

Standardization (**ITU-T**);

Development (**ITU-D**).

In more than 150 years of ITU existence it has never had a person from Russia in the post of Secretary General. As for the United States,

its representative did fill the position. An ex-staffer of the US regulator FCC, Gerald Gross, first acted as Secretary General between June 1958 and December 1959 following the sudden demise of ITU head Argentinean Marco Aurelio Andrade (G. Gross had been his aide). And in January 1960, he was elected ITU Secretary General, in which position he stayed until the end of 1965.

Throughout the ITU history, Russia, being its founder state, and its nationals made and continue to make priceless contribution to the work of the Union. The work of M.I. Krivosheyev who was active in various ITU entities for 65 years has been altogether without precedent. On May 17, 2015, when they marked the 150th birthday of the International Telecommunication Union, scientific consultant of the Radio R&D Institute M.I. Krivosheyev was awarded the premium ITU150 prize given to outstanding figures and scholars who contributed the most to the improvement of people's life quality the world over by introducing innovations in the area of information communications technologies (ICT).

Thus was marked M.I. Krivosheyev's personal contribution to the successful accomplishment of the ITU historic mission of furthering television broadcasting. At present this is a major information communication technology, for one can confidently say that for a number of decades it was difficult to picture a person living in any part of the planet, however remote, without television. It was the ITU that in the mid-1940s initiated embarking on international standardization in TV broadcasting, without which it would have been impossible to start its introduction on a large scale.

The fifth Plenary Assembly of the International Radio Consultative Committee (CCIR) that took place in Stockholm in 1948 instituted the 11th Study Group (SG 11) for studying and introducing international standardization of TV broadcasting from incandescence to the end, as it were. Although issues under its examination were originally of the analog kind, most of them are still relevant for standardizing digital TV broadcasting that became a leading research trend in the early 1970s.

In 1970, M.I. Krivosheyev was elected Vice Chair of SG 11 at the CCIR Plenary Assembly in Deli, and appointed acting chairman as of 1972. It should be said that by then color television had already been launched, and the world found itself divided among three incompatible systems, namely, NTSC, PAL, and SECAM. Those were the circumstances, in which they had to embark on the study of digital TV broadcasting.
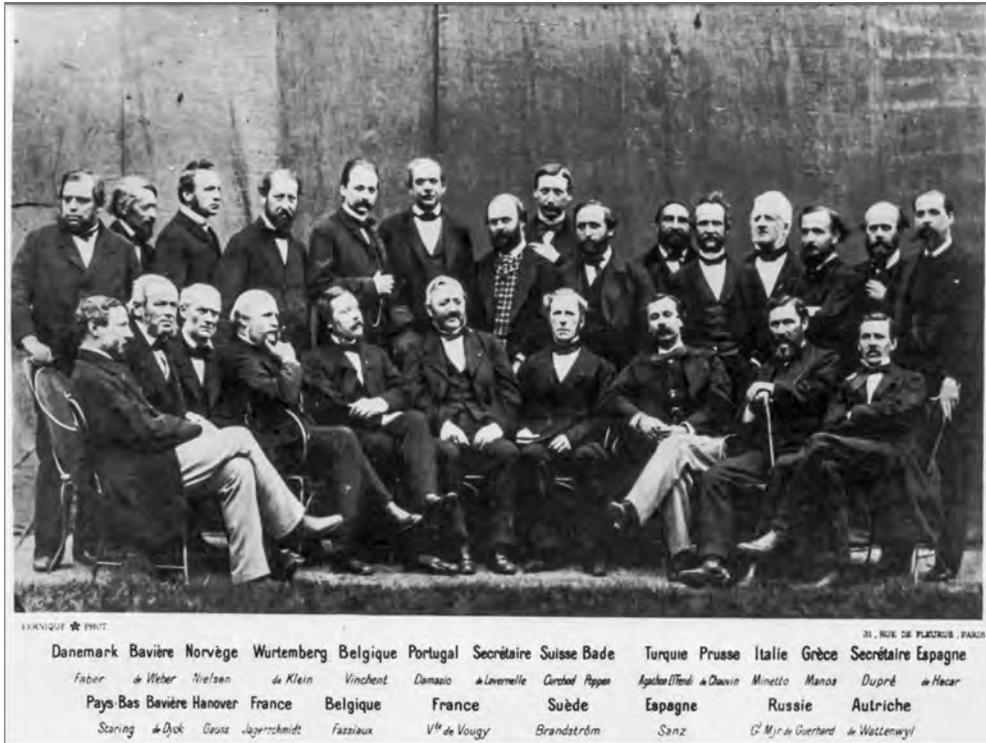
Special delegates to the International Telegraph Conference, Paris, 1865.
(Source: Historical archives of the International Telecommunication Union.)

M.I. Krivosheyev, as the acting group chair, pioneered a new approach to standardization in this sphere. On the eve of TV broadcasting going digital it was supposed that compressed uniform signals of digital studios would be transmitted along standard channels. That meant rock-solid frequency plans, channel bands of terrestrial and satellite communication equipment, giving a new lease on life to millions upon millions of analog TV sets with digital set-top boxes, unification of signals in television program production, etc.

That got a somewhat mixed reception. Some people were skeptical and doubtful, saying that this kind of compression was a myth, and it was generally advisable to postpone research till real prerequisites had emerged. However, no one bothered to put forward alternative suggestions. Then it was proposed launching a search for a coordinated solution on digital compression of TV signals to radically reduce the spectrum. Ultimately, they prepared the Study Program (SP 11A-1/11) that went down in history as the start of international effort
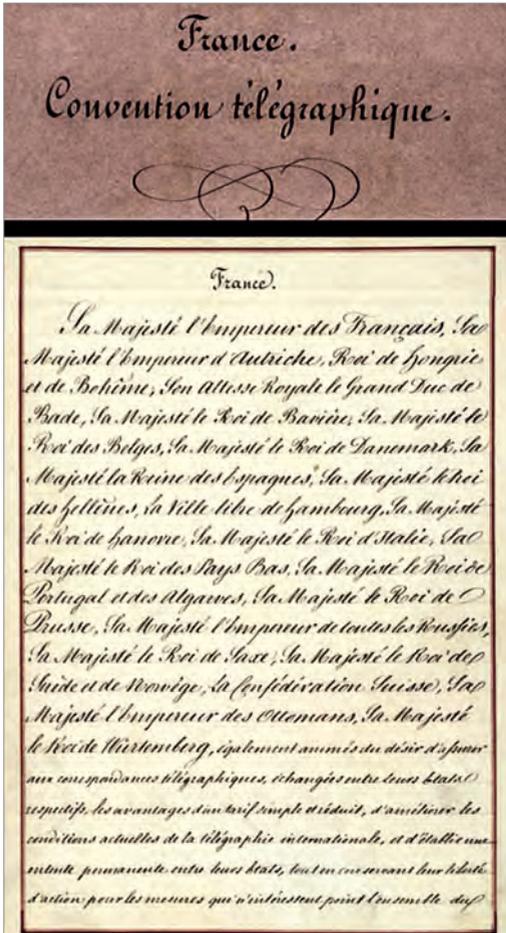
1865 International Telegraph Convention (Source: ITU)

consolidation for coding and compressing TV signals. Also, thanks to Japan's scientific contribution, they embarked on research into high-frequency television (HDTV 27/11).

Since work on compression required specific task outlining, M.I. Krivosheyev formulated an important technical requirement for the launch of digital TV
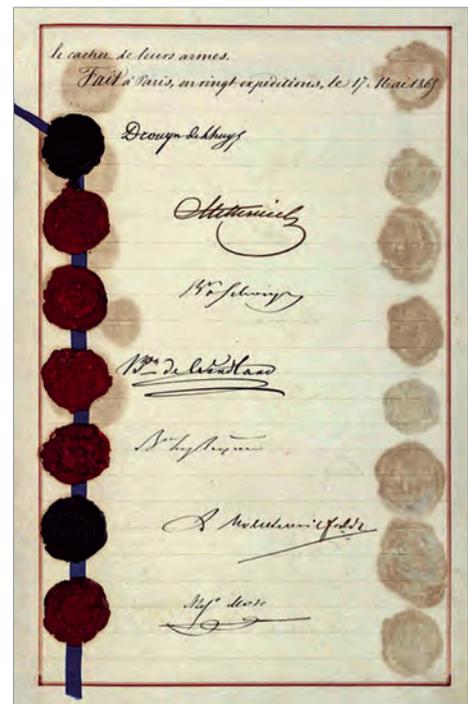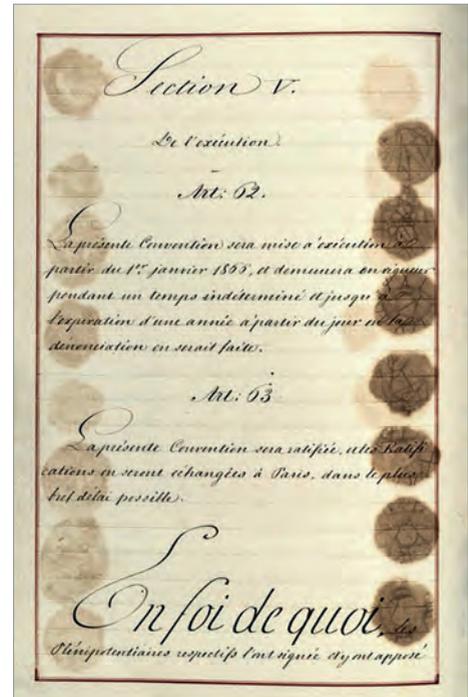
broadcasting, "Digital television (including HDTV and several compressed signals of standard-resolution TV programs) are to be transmitted in standard channel bands of six, seven and eight MHz used worldwide. M.I. Krivosheyev argued that there would also be developed mighty compression algorithms (in anticipation of MPEG standards) and efficient methods of channel modulation. Life bore out his bold prevision, and ITU-R Recommendations BT.798 and BT.1206 prepared in 1991 established frequency bands for terrestrial digital TV broadcasting at six, seven and eight MHz, as well as sanctioning the development of the now known systems of digital TV broadcasting (Recommendation BT-1306), without which it would have been impossible to hold the 2004/2006 Regional Radio Conference (RRC). The result was that digital dividends became reality for the first time.

Implementation of Conception 6, 7 and 8 served the basis of revising the Stockholm plan. That document went down in history as the starting point of preparing the 2004/6 RRC Conference that pioneered plans for the introduction of terrestrial digital television broadcasting. M.I. Krivosheyev was the doyen and chair of the first session of the Conference in 2004.

The work of SG 11 on digital TV broadcasting proceeded in conditions of technological diversity with various technical levels, economic possibilities and interests of different countries, as well as cut-throat competition among manufacturers. And yet, the Group under Russian chairmanship managed to formulate and introduce into television science a global approach to developments and standardization of TV broadcasting systems and services. This approach displayed fundamental novelty that took into account the need to harmonize and interconnect program production complexes, technological features of basic TV channel sections with their radio frequency support. This approach was also used in devising the Recommendation for Digital Studios, as well as in HDTV studies.

One more project devised under the Russian aegis was Recommendations for Digital Studios approved at the 1981 meeting of SG 11. The highest point in the destiny of that historic Recommendation was the 15th Plenary Assembly of the CCIR that convened in Geneva in February 1982. The Plenary Assembly considered a number of addenda with amendments. It also tasked SG 11 chair with perfecting and coordinating the draft of the Recommendation considering those addenda.

The result was emergence of a new draft of the recommendation (Doc.11/1027, Rev. 1). The Recommendation (BT.601) was passed unanimously. It went down in history as the first ever world uniform standard for digital TV studios ousting mutually incompatible systems of NTSC, PAL and SECAM.

In order to consolidate efforts to create the uniform standard, they prepared the report titled Global Approach to HDTV with a model of the multifunctional HDTV system proposed by SG 11 chair (Doc. 11/245 of 12 November 1987).

In 1999, SG 11, after years of efforts, adopted the digital version of ITU-R Recommendation BT.709-3, which became the uniform world standard for HDTV systems.

In 1992, when the conception of HDTV-6-7-8 had been translated into practice, the SG 11 chair at the session of the CCIR Task Group 11/4 (hosted by Washington on October 13-15, 1992), stemming from the results obtained in Japan, suggested embarking on international standardization of TV systems with a definition of over 1,000 lines selected for HDTV systems. They worked out Question 40/6 and the first BT.1201 ITU-R Recommendation for Extremely High Resolution Imagery.

The formats 3840x2160 (4k) and 7680x4320 (8k) were chosen for ultrahigh definition systems. The 8k Format practically erases the difference between TV pictures and reality.

The year 1993 also witnessed the start of studies of interactive television and radio broadcasting systems on Russia's suggestion. SG 11 became the first ever organization to have started their international standardization (Question 232/11, Recommendation BT.1369). That made for the furthering and wide dissemination of a new important service.

Way back in the conception of the first interactive ITU Telecom (Telecom Interactive 1997) the SG 11 chair proposed the concept of worldwide broadcasting roaming (WBR), similar to that used in mobile communications. In that case it meant that programs could be received in any point of the world where these programs were accessible, involving a single receiver regardless of the broadcasting platform. That also made possible a considerably wider and simplified access to television and radio broadcasts. Given the progress in technologies, Russia initiated in 2012 adoption of the first *Question for studies* on the subject (Question 136/6). They drew up the first *Recommendation for WBR household appliances* (Recommendation BT.2072).

Participants in the International Telegraph Conference (Paris, 1865)

Country in 1865	Plenipotentiary delegates	Special delegates	Country or countries today
Austrian Empire	H.E. Prince VON METTERNICH-WINNEBURG, Ambassador Extraordinary of H.M. the Emperor of Austria	Mr BRUNNER VON WATTENWYL, Director of Telegraphs	Austria and Hungary
Grand Duchy of Baden	Baron VON SCHWEIZER, Envoy Extraordinary and Minister Plenipotentiary of H.R.H. the Grand Duke of Baden	Mr POPPEN, Counsellor of the Ministry and Mr SCHWERD, Inspector of Telegraphs	Germany
Kingdom of Bavaria	Baron VON WENDLAND, Envoy Extraordinary and Minister Plenipotentiary of H.M. the King of Bavaria	Mr VON WEBER, Counsellor of the Ministry of Foreign Affairs and Mr VAN DYCK, Director of Telegraph Lines	Germany
Kingdom of Belgium	Baron BEYENS, Envoy Extraordinary and Minister Plenipotentiary of H.M. the King of the Belgians	Mr FASSIAUX, Director-General of Railways, Posts and Telegraphs and Mr Julien VINCHENT, Engineer in Chief, Director of Telegraphs	Belgium
Kingdom of Denmark	Count Léon VON MOLTKE-HVITVELDT, Envoy Extraordinary and Minister Plenipotentiary of H.M. the King of Denmark	Mr FABER, Director-General of Telegraph Lines	Denmark
Kingdom of Spain	H.E. Mr Alexander MON, Ambassador Extraordinary and Minister Plenipotentiary of His Catholic Majesty	Mr SANZ, Director of Telegraphs and Mr DE HAKAR, District Inspector	Spain

Country in 1865	Plenipotentiary delegates	Special delegates	Country or countries today
Kingdom of Prussia	H.E. Count VON GOLTZ, Ambassador Extraordinary and Plenipotentiary of H.M. the King of Prussia	Mr DE CHAUVIN, Lieutenant-Colonel, Director of Telegraphs	Germany
Russian Empire	H.E. Baron VON BUDBERG, Ambassador Extraordinary and Plenipotentiary of H.M. the Emperor of Russia	Mr VON GUERHARD, Major General, Engineer and Director of Telegraphs	Russian Federation
Kingdom of Saxony	Baron VON SEEBACH, Envoy Extraordinary and Minister Plenipotentiary of H.M. the King of Saxony	Baron VON WEBER, Director of Railways of the State of Saxony	Germany
United Kingdoms of Sweden and Norway	Georges Nicolas Baron ADELSWARD, Envoy Extraordinary and Minister Plenipotentiary of H.M. the King of Sweden and Norway	Mr BRÄNDSTRÖM, Director-General of Swedish Telegraphs and Mr NIELSEN, Director-General of Norwegian Telegraphs	Sweden and Norway
Swiss Confederation	Mr KERN, Envoy Extraordinary and Minister Plenipotentiary of the Swiss Confederation	Mr CURCHOD, Central Director of Telegraphs	Swiss Confederation
Ottoman Empire	H.E. DJÉMIL-PACHA, Ambassador Extraordinary of H.M. the Sultan	Mr AGATHON EFFENDI, Delegate of Turkey	Turkey
Kingdom of Württemberg	Baron VON WAECHTER, Envoy Extraordinary and Minister Plenipotentiary of H.M. the King of Württemberg	Mr VON KLEIN, Director of Telegraphs of the Kingdom of Württemberg	Germany

Country in 1865	Plenipotentiary delegates	Special delegates	Country or countries today
French Empire	H.E. Mr DROUYN DE LHUYS, Minister Secretary of State, Department of Foreign Affairs	Mr HERBET, State Councillor, Director in the Ministry of Foreign Affairs; Viscount DE VOUGY, Director-General of Telegraph Lines; and Mr JAGERSCHMIDT, Under-Director for Consulates and Commercial Affairs, Ministry of Foreign Affairs	France
Kingdom of Greece	Mr PHOCION ROQUE, Plenipotentiary of H.M. the King of the Hellenes	Mr MANOS, Head of Section, Ministry of the Interior	Greece
Free City of Hamburg	Mr HEEREN, Minister Resident for the Free Cities of Germany		Germany
Kingdom of Hannover	Baron VON LINSINGEN, Envoy Extraordinary and Minister Plenipotentiary of H.M. the King of Hannover	Mr GAUSS, Counsellor, Delegate of the Kingdom of Hannover	Germany
Kingdom of Italy	Cavaliere NIGRA, Envoy Extraordinary and Minister Plenipotentiary of H.M. the King of Italy	Cavaliere DI MINOTTO, Head of Department, Ministry of Public Works	Italy
Kingdom of the Netherlands	Mr LIGHTENVELT, Envoy Extraordinary and Minister Plenipotentiary of H.M. the King of the Netherlands	Mr STARING, counsellor, Department of the Interior	Netherlands
Kingdom of Portugal	Viscount DE PAÏVA, Envoy Extraordinary and Minister Plenipotentiary of H.M. the King of Portugal	Mr DAIMASIO, Colonel of Artillery, Director-General of Telegraphs	Portugal

On Russia's suggestion they started in 2008 a study of broadcasting and multimedia video-information systems (VIS) at the ITU-R. For the first time VIS made possible outside TV broadcasts on screens of various sizes in public places. They are also needed to notify the population and solve other information problems. The new technological solutions helped VIS voice-over, as it were, thanks to mobile communication terminals. Uniting millions of interactive VIS screens and the multibillion park of mobile devices will help considerably increase the traffic of mobile and other communication equipment.

With the switch to digital TV broadcasting initiated by the SG 6 Honorary Chair they developed the Question of Digital 3D TV

Outgoing Radio Regulations Board members, and ITU
Secretary-General Houlin Zhao. (Mr Nikolay Varlamov
is second from left, Mr. Alexeiy Borodin - fifth from the right).
(Image credit: ITU/R. Farrel)

Broadcasting Studies (Question 128/6). It became a global vector in 3D TV broadcasting exploration. In accordance with this Question, they devised Recommendations BT.2021, BT.2025, BT.2027 and Report BT.2160.

At the preparatory meeting prior to the World Administrative Radio Conference (WARC-77) that convened in Geneva in 1976, it was suggested that the frequency Plan of 1977 provides for the possibility

of transmitting signals of TV broadcast programs by digital methods. That innovative idea belonged to M.I. Krivosheyev. It was taken into account in the new frequency Plan in 2000 and made for considerable improvement in efficiency.

The list of initiatives and practical achievements involving Russian representation in the IEU is nothing if not impressive. In 1992, they worked out the Question of Studying Transmission of Digital Multi-program Television via the Satellite Transponder on our suggestion (Question 217/11). Currently, this technology is used in all satellite television broadcasting systems.

We helped promote the system of assessing the quality of TV imagery, control and measurements of TV channel parameters. What merits a special mention is the domestic method of comparison fields for two images on the screen of the same monitor. It was first presented as Soviet contribution at the meeting of SG 11 in Moscow in 1958. The method has been included in Recommendation BT.500 and is considered a highly effective means of subjectively estimating the quality of TV imagery.

The stock of domestic developments within the ITU framework also contains the theory of weight functions and weighing filters for a subjective expert examination of the TV broadcasting system that help estimate image quality with a view to the specifics of perceiving various types of distortions (ITU-T Recommendations J.61); the method of remote control of basic TV channel characteristics based on transforming received broadband measuring signals into their narrowband equivalents and their transmission to the control point via reverse channels (Recommendation BT.1789).

Russia is also the initiator of expanding studies of broadcasting standards covering the entire channel, including the receiving side (end to end). That was reflected in ITU-R Question 102-2/6. This is a field of close cooperation between the ITU and manufacturers.

Another major contribution was made by the RF to protect TV viewers against the health-hazard psychophysiological effect of TV program watching (Doc. 6M/65 of September 7, 2001). It served the basis of drawing up ITU-R Recommendation BT.1702, Guidance for the Reduction of Photosensitive Epileptic Seizures Caused by Television.

As requirements for overcoming digital inequality increased, as did those for transmitting top-quality 2D/3D video information, expansion of internet services, all-embracing interactivity and mobility of the user,

VIS TV broadcasting, efficient use of radio spectrum, in 2013 it was proposed taking up a study of a fundamentally new global platform of digital TV broadcasting. The SG 6 meeting in November 2014 approved the Question of studying the global platform of digital broadcasting (Doc. 6/291).

Russia rightly commands respect at the ITU. The traditions of Soviet experts have been successfully continued to this day. A whole galaxy of highly skilled scholars and experts from the Radio R&D Institute, the Russian Satellite Communications Company, the Main Radio Frequency Center, Roskosmos, Rostelekom, universities and other entities are at present working at the ITU.

Thus, for instance, A.Ye. Kucheryavy, professor, head of the Communication Networks and Data Transmission Department at St. Petersburg State University of Telecommunications, used to head ITU-T SG 11, Protocols and Signalization. Let me note that he was also vice president of ITU-T Study Group 11 between 2005 and 2008, and from 2009 to 2012.

One of the acknowledged experts in international law regulation of satellite networks is V.A. Strelets. In 2019, the ITU Assembly of Radio Communications appointed him chair of the Study Group of the ITU Radio Communication Sector (ITU-R), SG 4, Satellite Services.

V.A. Strelets has nearly 30 years of research, technical and administrative experience under his belt in the area of regulating the use of radio frequency spectrum. V.A. Strelets was also vice chair of the Eighth ITU-R Study Group. From 1993 on, he took part in the activity of working and task groups of the Fourth and Eighth Study Groups of the ITU Radio Communication Bureau, the European Conference of Postal and Telecommunication Administrations (CEPT) and the Regional Commonwealth in the Field of Communications (RCC). In 2007, he was appointed vice chair of the ITU-R consultative group, which prior to the Guadalajara Plenipotentiary Conference had been headed by V.V. Timofeyev. Also, from 2008 to 2010 he was adviser and acting adviser at ITU Council sessions. At the Guadalajara Plenipotentiary Conference of 2010 he was elected member of the ITU Radio Regulations Committee.

Many domestic specialists are SG vice chairs for all the three ITU work fields. Functioning in the organization are several regional groups of corresponding SG 3, 11, 13 and 20 for the countries of Eastern Europe and Central Asia that unite the interests of regulators and business in the CIS countries.

Representatives of the Russian delegation at the ITU Plenipotentiary Conference and ITU Secretary General Houlin Zhao. (Bella Cherkesova, head of the Russian delegation, second from right)

Russia successfully chaired the ITU Radio Communication Assembly in Sharm-el-Sheikh in October 2019. The forum is traditionally organized on the eve of the seminal event in global radio communications, the World Radio Communication Conference, which took place between October 28 and November 22, 2019.

The fact that Russian representative S.Yu. Pastukh, deputy director of the Electromagnetic Compatibility Analysis R&D Center at the Radio Research and Development Institute, was appointed chair of the Assembly, which he successfully conducted, signifies acknowledgment of the important role of the Russian Federation in the ITU, and also international recognition of S.Yu. Pastukh as a top-notch professional well-versed in the area of radio communications. For the last eight years he had successfully headed the 1st Study Group of the ITU Radio Communication Sector (ITU-R).

The 2019 Radio Communications Assembly became a largely signal event. It summed up the work of ITU-R Study Groups on mapping out ITU-R Recommendations and Reports, which are among the most important regulating documents in radio communications at the international level.

The focus of the Assembly's attention was IMT matters, in particular, amending ITU-R Recommendation M.1036 that defines frequency plans

for introducing the IMT standard mobile telecommunication terrestrial segment (5G systems included) in frequency bands reserved for IMT in the Radio Regulations (RR).

Among the most difficult matters considered by the Assembly was the draft of a new ITU-R Recommendation, SA.[IMT-EESS/SRS COORDINATION], that dealt with the methodology of defining coordination zones of terrestrial stations of satellite service, and ground-based stations of the Earth space research to protect the said systems against interferences from IMT-2020 systems within the frequency ranges of 25.5 GHz to 27 GHz and 37 GHz to 38 GHz. Thanks to the efforts of Russia's delegation, the Radio Communication Assembly tasked the 7th ITU-R Study Group with fine-honing the said project and passing the Recommendation in 2021, at the latest. These ranges are extremely important for the Russian Federation, since the 25.5 GHz to 27 GHz range has top priority for introducing 5G/IMT-2020 mobile communication systems in this country.

The Russian delegation at the ITU Plenipotentiary Conference, Bucharest, 2022

On top of that, the Radio Communication Assembly adopted two new Resolutions, which specified the main goals of research into television broadcasting furthering, namely, Principles for the Future Development of Broadcasting, ITU-R Resolution 70, and ITU-R Resolution 71, Role of the Radio Communication Sector in the Ongoing Development of Television, Sound and Multimedia Broadcasting. On the basis of ITU research made in accordance with these Resolutions the future system of next-generation standards and technical solutions will be outlined and developed at the international level in the area of production, international exchange and delivery of television broadcasting programs.

The adoption of these Resolutions is a response to the challenges faced by television broadcasting, the need to raise the speed of transport flows for transmitting television programs in new high- and ultrahigh definition formats, and on the other hand, the likelihood of the accessible radiofrequency range getting reduced because in some countries a portion of working frequency bands of television broadcasting are

*Mark Krivoshein is awarded the ITU Gold Medal (in the center) (Source: ITU)*

handed over to other radio services, such as mobile communication networks. A no less relevant task is to harmonize standards and systems of next-generation digital television broadcasting at the global level to cut the cost of equipment, speed up the development of advanced technological solutions and television systems.

In the course of the 2019 Assembly they elected chairs and deputy chairs of Study Groups and other ITU-R working bodies.

For the first time in the ITU history Russian representative V.A. Strelets, Scientific Consultant at the Radio R&D Institute, was elected Chair of the 4th Study Group (SG), Satellite Services. Besides, Russian representatives were elected deputy chairs of the following ITU-R Study Groups:

• SG 1, Spectrum Management, Tatiana Sukhodolskaya, a Radio R&D Institute staffer;

• SG 3, Radio Wave Propagation, Olga Yastrebtsova, a Radio R&D Institute staffer;

• SG 5, Terrestrial Services, Alexei Shurakhov, a Radio R&D Institute staffer;

• SG 6, Broadcasting Services, Andrei Lashkevich, a Radio R&D Institute staffer;

• SG 7, Science Services, Igor Zheltonogov, a Geizer Telekom public company staffer.

Elected deputy chair of the Radio Communication Consultative Group was A.V. Vasilyev, of the Radio R&D Institute; deputy chair of the Preparatory Meeting for the 2023 Conference, S.Yu. Pastukh, of the Radio R&D Institute, and deputy chair of the Coordination Committee for Vocabulary, Oksana Khimach, of the Radio R&D Institute.
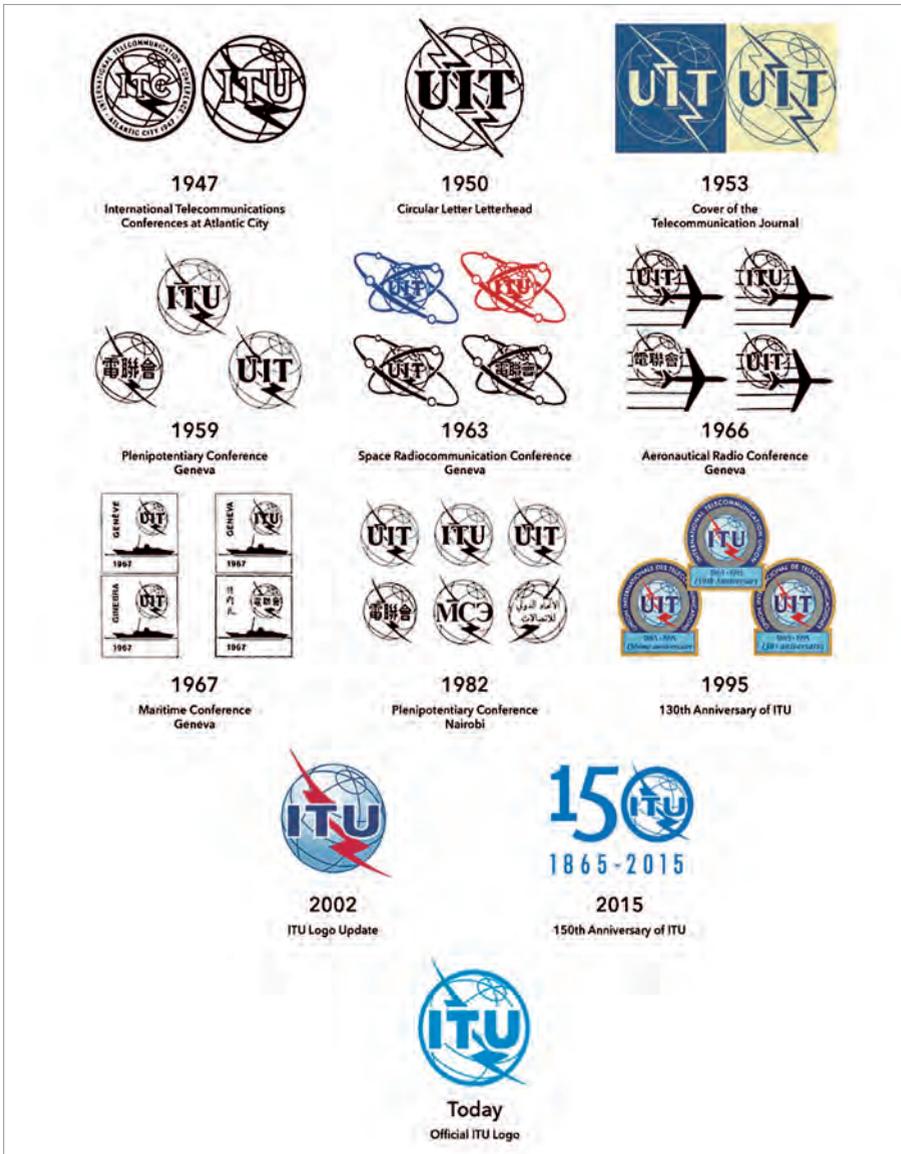
ITU's logo through the years

Election of staffers from Russia's leading Institute for research in the said area to the posts of SG 4 Chair and deputy chairs of nearly all study groups and working parties of the ITU-R became possible thanks to the active part played by the Radio R&D Institute in the work of the Radio Communication Sector; this means that the RF pays close attention to the development and support of research activity.

Sergei Pastukh (in the center) (Source: ITU)

The decisions taken by the 2019 Radio Communication Assembly defined the research program of the ITU Radio Communication Sector for the period until 2023 and laid down the technological basis needed for the work of the 2019 World Radio Communication Conference.

Secretary General decorated S.Yu. Pastukh with an ITU Silver Medal for the faultless conduct of the Radio Communication Assembly and his contribution of many years to the work of the Union.

To coordinate work with the ITU the Regional Commonwealth in the Field of Communication (RCC) was set up in Moscow on December 17, 1991, by the Communications Administrations of 11 countries, the Republic of Azerbaijan, the Republic of Armenia, the Republic of Belarus, the Republic of Kazakhstan, the Republic of Kyrgyzstan, the Republic of Moldova, the Russian Federation, the Republic of Tajikistan, Turkmenistan, the Republic of Uzbekistan, and Ukraine. In October 1992, heads of government from member states of the Commonwealth of Independent States (CIS) met in Bishkek (the Republic of Kyrgyzstan) to approve the establishment of the RCC and in conclusion signed the *Agreement on International Relations Coordination in the Field of Postal and Telecommunications*. The RCC announced itself open to other Communications Administrations for joining.

At present the RCC is an international organization with the functions of an interstate CIS coordinating body in the area of postal and telecommunications, and also has the observer status with the International Telecommunication Union (ITU) and the Universal Postal Union (UPU), as well as interacting with international and regional organizations, and is active in the work of conferences and forums.

Traditionally, proposals for the work of conferences and assemblies are sent to the ITU on behalf of six main regional organizations, the African Telecommunication Union (ATU), the League of Arab States (LAS), the Asia-Pacific Telecommunity (APT), the European Conference of Postal and Telecommunication Administrations (CEPT), the Inter-American Telecommunication Commission (CITEL), and the Regional Commonwealth in the Field of Communications (RCC).

The general proposals by Communication Administrations of the RCC member states hold the pride of place and are highly appreciated at the ITU for meticulous elaboration and novelty of ideas.

All difficult issues are habitually dealt with by the ITU at the meetings of representatives from these six organizations. Both at the top-level events as such, and in preparation for them, regional organizations exchange opinions and try to reach mutually acceptable solutions even on the most acute issues.

When electing candidates for posts of authority at ITU working bodies, they also observe an equitable interregional approach.

Thus, a representative of an RCC member state invariably has a place of one of the six vice chairs reserved for them at all ITU conferences and assemblies. A similar attitude is also practiced in electing the leaders of consultative groups and study groups.

The ITU Secretary General and ITU Bureau Directors hold consultations on a regular basis and take part in the meetings conducted at the RCC.

The RCC has signed *Memoranda of Mutual Understanding and Cooperation Agreements* with nine regional organizations, the Asia-Pacific Postal Union (APPU), the League of Arab States (LAS), the Pan-African Postal Union (PAPU), the Postal Union of the Americas, Spain and Portugal (PUASP), the Asia-Pacific Telecommunity (APT), the Association of European Public Postal Operators (PostEurop), the European Conference of Postal and Telecommunication Administrations (CEPT), and the Inter-American Telecommunication Commission (CITEL).

Under Resolution 58 of the ITU 2010 Plenipotentiary Conference, the RCC was given an official status at the ITU as one of the six main regional organizations of telecommunications. A great achievement of the joint work by the Communication Administrations of the RCC member states at *the ITU 2002 Plenipotentiary Conference* may be considered adoption of Resolutions on ITU using six official languages on an equal footing, Russian included, as of January 1, 2005. Thus, the RCC won the right to participate in the work of the ITU as an equal member together with the other five regional organizations, which considerably improved the opportunities of the RCC member states in tackling the more difficult issues at future international forums.

The nomination of candidates for the post of ITU Secretary General, and also candidates for the ITU Council was discussed at the Council of RCC Communication Administration heads.

To sum up, it should be said that Russia made an invaluable contribution to the diverse work of the ITU throughout its existence. Thanks to our activity, standards are adopted, and regulations are worked upon to form the basis of high-level international treaties. Experts from Russia work in virtually all ITU sectors, did and do head study groups, and act as SG vice chairs of all the three lines.

Russia has every reason to propose its candidates for any ITU posts, and this is no vain ambition, but a perfectly justified working necessity.

Rashid ISMAILOV

VimpelCom president

HOW TO RESTORE CONFIDENCE IN THE NEW DIGITAL WORLD?

- Rashid Rustamovich, the ITU Secretary General election was held. Your competitor was a representative of the US. The election campaign is always a challenge. Can we assume that in the current conditions your competitors fought without rules against you?

- This September the ITU Plenipotentiary Conference has elected a new ITU Governance for the next four-year term. Houlin Zhao (PRC), the present Secretary General, will resign at the beginning of 2023.

In the course of the election campaign the main competition was conducted between the candidates from Russia and the US. It is noteworthy that our countries have polar views on the ITU development; and unfortunately, foreign-policy contradictions enter the Union's agenda. At this background virtually military propaganda against the candidate from Russia was launched.

- Judging by your electoral program, you know exactly how to manage the work of the ITU for its development and prosperity.

- Yes, I do. I know what to do or, rather, what it's necessary to do being the ITU Head. I understand perfectly well interests of the countries which need the development of their own telecommunications infrastructure, but also, I understand where the world heads and what is the current theme of the ICT.

- You've got a great practical experience in this sphere, haven't you?

- Yes, my thirty years' experience (this is a competitive combination of practical experience both in the private and public sectors, as well as in the ITU) allows me to understand needs and interests of representatives both of businesses and states, as well as the knowledge of the ITU organization and functioning.

I participated in building cellular networks through Russia and in CIS, worked at the Ministry of Communication, where we successfully developed the program of access to connectivity in distant settlements of Russia. I was director general of "Nokia Rossiya", director general of IT-startup for Internet-security and then was President of one of federal mobile operators of Russia. At the same time, I did not leave issues of state and global regulation out of my sight. My program "Five Steps to the ICT Humanization" is the result of this experience.

The important part of my life experience is my work at the Ministry of Communication and Mass Media, though it lasted but for six years. Also, at the same time, I was head of the Russian delegation at the ITU. In 2018, I was elected Chairman of the ITU Council and conducted this high-level event highly professionally taking into consideration the interests of all the Member States of the ITU Council.

- What goals and tasks would you set in front of the ITU for the nearest future?

- In the nearest future the ITU is to play a significant role in leading the work on standardizing technologies and making recommendations for the broadest scope of application.

It is noteworthy that opening new horizons of possibilities digital technologies are at the same time challenges to the global society being more serious than the prior ones, because they possess a colossal potential for changing age-old styles of life. This problem is so comprehensive that countries cannot solve it separately. This is the challenge for the mankind.

How to restore confidence in the new digital world? This seems to be the most important question. The goal is not "the development for the development sake" but improving the quality and security of human life, efficiency of labor activity, ensuring the guarantee of the development (training, self-development) despite turbulent turns of technological progress.

Digital technologies being left unprotected in "free" Internet have currently been compromised. The only way to restore confidence in them is coordinated and targeted work of all the countries.

In the course of technological development, the security problem becomes more acute. The application of 5G networks transmits the security problem to a new "Severity Level". Now fraud in solutions with application of the Industrial Internet of Things (IIoT) may threaten users' life and health (e.g., driverless cars, robotic plants, telemedicine), but not only their personal data. The growing spectrum of production processes can

be destabilized remotely by either manipulating production protocol or simply by overloading technical process through DDoS-attacks.

Now it is clearly seen that the desire to make technologies as accessible and dissipated as possible has shifted the focus from the main component of the whole system (i.e., humans with their values and rights) having laid a large conflict potential, which is giving rise to a new luddism. It turns out that technologies are easy to be made to serve corporative or state manipulations.

The chief challenge of modernity is the problem how to reconcile humans with the new digital world created for them. Progress cannot be stopped. In the nearest future we will have not only to formulate but also to solve the whole spectrum of problems.

- It seems that one of the main problems to solve immediately is international standardization.

- Yes, international standardization is a very serious factor of success, but these efforts must extend beyond technical issues.

It is necessary to create common international rules for driverless cars, autonomous physical and virtual systems with the elements of artificial intelligence at the level of both technical regulations and ethical codes.

The ITU role must be strategic, determining, visionary, but not bureaucratic one, belonging to a unipolar world, disinterested in international development.

- For all that, what must the ITU do first and foremost?

- The ITU must do its duty, the duty of the international organization of such a high level. We must develop international norms and standards to determine the future life of the entire digital world. It means, to determine the interaction of entirely digital governments, the regulations in the application of technologies toward human life, the security of human rights

of people with entirely digital identity, the interaction of these digital identities. These are the most complicated issues which seem to be least cared about so far, because they resemble texts of fantastic novels.

The regulation of the digital sphere is like the World Air Code, like the Outer Space Code, like the agreement on the use of space resources. No country can have its own goals there, but only common ones, because we interact on the same field and on equal terms.

- Do you think the current ITU is ready to manage the issues of the future? Or is it necessary to reform the Union?

- You are right asking the question of the necessity to reform the organization. I think it is a question of the ITU administrative model; its reform proposes a two term limits for the Union elected positions irrespective of the transition from one position to another (this requirement does not extend to present positions).

This is conditioned by the desire to attract new participants to the Union. This need is long overdue. It's no secret that since its establishment only 24 countries nominated their candidates for elected positions.

The distributed participation of Member States in the ITU management looks like this: France - 10, Switzerland - 9, the US - 4, Germany - 3, the United Kingdom - 3, Tunisia -2, Russia - 1, China - 1, Japan - 1, India - 1, the Republic of Korea - 1, Indonesia - 1, Australia - 1, Mali - 1, Burkina Faso - 1, Cameroon - 1, Kenia - 1, Saudi Arabia - 1, Uruguay - 1, Canada - 1, Brazil - 1, Argentine - 1, Netherlands - 1, Finland - 1.

It means that 169 Member States have been left behind; they could not participate in the Union management, which testifies greatly to the existing geographical balance (or disbalance) of the international process. It's hardly possible to consider this situation positive, taking into account that ICT has the strongest influence on economies of these countries.

Russian delegation at the ITU Plenipotentiary Conference visiting the Russian Ambassador, Bucharest, 2022

At the same time, the restriction of repeated elections of the same person is the basic principle of the alteration of power having a significant importance in modern politics.

The thing is that constant promotion (or shift) from one position to another by the same employees every time reduces the possibilities for the rest. At the same time, the union objectively needs "fresh blood". The ITU administration's average age gives the reason to think of the necessity to attract the youth and create conditions for their development. They were born in the world of new technologies. They must become the guides of interests and culture of the new generations.

The application of efficient measures meant for upgrading skills and promotion of the youth, the encouragement of tutorship and the use of elder experts' experience, the attraction of trainees with regard to geographical and gender balance are objectives of the union's further development.

The rotation of the elected positions represented by qualified people from different countries will increase the geographical presence and expert level.

- For vast majority of the countries the digital sovereignty level does not permit to aspire to the independent role in the global information environment. What to do with this?

- Unfortunately, the exclusively market principles of the network functioning give rise to the situation when the global information space can develop the harmful environment for the users.

In the absence of the efficient International Legal Framework, it becomes the space of global information- and cyber-war without rules.

It is important to correct the imperfection of the international legal base which sometimes comes to the principles of free information dissemination, sometimes is treated as a mechanism to ensure dominance.

At the same time, it is necessary to consider fundamental differences of Internet from the existing systems and structures and avoid to copy mechanically well-known methods of the offline world to manage Internet. It is necessary to develop the existing experiences and build new management techniques.

In the current situation the states must act proceeding both from the consideration of preserving their own sovereignty and from understanding global character of Internet and information society.

The appeals to digital sovereignty are heard in many different countries, also in liberal democracies. The approaches of most states have become more pragmatic. Their practicality is grounded either on the desire to get equal access to the new technologies or to preserve leading positions in the sphere.

But the digital sovereignty does not magically emerge, if its attribute is a line in a list of names; it originates, if there are real opportunities to create one's own platform solutions and infrastructure management, such as technologies and means to prevent cyber-attacks.

The infrastructure sovereignty is first and foremost the operating status of a network, even in the case of a catastrophic power failure of the main cross-border channels. This is not the isolation of the global network, but the insurance against problems.

Today ICT exerts decisive influence on national and global development and determines the degree of the sovereignty comparable with nuclear technologies of the 1940s or space rocket technologies in 1950s, 1960s, 1970s.

The current and (in a greater degree) future face of the world is determined with the development level and the adoption rate of the newest information technologies, such as virtual finances, artificial intelligence, big data, etc. In recent years, leaders of many states see more threats than opportunities for their economies, finances and cultures from cross-border information flows.

Our world has changed, and we must adapt to the new reality.

WHY IT IS SO IMPORTANT FOR THE UNITED STATES TO TAKE OVER THE LEADERSHIP OF THE INTERNATIONAL TELECOMMUNICATION UNION

In today's world, telecommunications and information and communication technologies (ICTs) are becoming key instruments of influence for states in the international arena. Geopolitical rivalry has to a large extent shifted to the area of ICTs. For a state, having a digital advantage is now akin to its economic potential and politico-military power in terms of determining its standing in the system of international relations.

Amid growing challenges and threats in the use of ICTs, the International Telecommunication Union (hereinafter — the ITU, Union) as a specialized agency of the UN system plays a crucial role in global cooperation between states in the development of modern digital technologies. Suffice it to say that the Union allocates global radio spectrum and satellite orbits, develops technical standards ensuring that networks and technologies seamlessly interconnect, strives to improve access to ICTs worldwide, and promotes international cooperation in the interests of developing countries, including the development of telecommunication networks, enhancement of technical facilities and their efficient operation.

However, the functioning of this international organization, which is, by virtue of its mandate, a purely technical agency, is beginning to stall owing to the efforts of certain — first of all Anglo-Saxon — countries which seek to politicize its work.

Specifically, the Unites States, in an effort to preserve and increase its global technological dominance, is attempting to gain de facto sole control of the Union and turn it into an instrument serving the narrow interests of a small group of countries in the area of ICTs. In practical terms, this means imposing Anglo-Saxon (i.e. American) standardization on the global ICT development and essentially blocking the adoption of the rest of the world's advanced digital technologies — even though it is a well-known fact that the United States has long lost its innovative role in the global digital transformation.

To fulfil these tasks, Washington has nominated its candidate — Doreen Bogdan-Martin, Director of ITU's Telecommunication Development Bureau, — for the post of ITU Secretary-General, whose election is to be held during the next ordinary Plenipotentiary Conference of the Union (26 September – 14 October 2022, Bucharest, Romania). If she is elected, the ITU will inevitably be remoulded to promote the interests of the United States and its satellite countries while ignoring the opinions of other states. It can be expected that, in pursuit of their national interests, the Americans will put obstacles in the way of other countries' advanced technologies and steer the discussion away from the Union's actual agenda, substituting serious issues with the notorious gender agenda. As a result, intense confrontation around technologies will paralyze the work of the Organization.

The way the United States acts in the international arena in dealing with issues of international information security (IIS) often hampers the inclusive participation of all states in the process as well as their technological progress.

Similarly, the Unites States is trying to interfere with the UN-led negotiation process on ensuring IIS, undermining the activities of the UN Open-Ended Working Group (OEWG). Washington and its allies are clearly annoyed by this mechanism, which was created on Russia's initiative and allows all 193 UN Member States to participate in its work on an equal footing. In an attempt to impose their terms, the Americans categorically demanded that non governmental entities be given the right to participate in OEWG sessions. The idea is to use NGOs which they control for promoting and legalizing their neocolonial ambitions in the area of ICTs and secure technological dominance of the West over developing countries.

The same "general line" is being shaped by the United States as regards the ITU. In the course of the sessions of the World Telecommunication Standardization Assembly (on 1-9 March 2022 in Geneva, Switzerland) and World Telecommunication Development Conference (on 6-16 June 2022 in Kigali, Rwanda), the Americans initiated a vote to remove Russia's representatives put forward by the Regional Commonwealth in the field of communications from the list of nominees to the managerial positions in the ITU research commissions and consultative groups. Thus, the provisions of the Union's Constitution and Convention were blatantly violated. The United States applied a "road-roller" algorithm that had been previously tested on other platforms, which allowed it to cater to its interests in violation of the ITU statutory documents.

Russia adheres to an essentially different approach by consistently advocating the need to reach specific universal arrangements (primarily, to develop an international legal regime for ICTs), support for the leading role of states in the negotiations process related to ensuring the international information security, protection of sovereignty in information space, and building capacity of the developing countries in this area. This resonates broadly and positively in the non-western world.

Standing at its origins, Russia, since the foundation of the Union in 1865, has been taking an active part in the ITU activities and consistently speaking for the strict observance of the Union's statutory documents, constructive resolution of any issues based on the balance of interests of its members, mutual respect and spirit of friendly cooperation.

Guided by the universal values in terms of ensuring the international information security, Russia recommended Rashid Ismailov as its candidate for the post of the ITU Secretary-General. He is well-known in the ICTs community, has deep technical expertise with high experience in the telecommunications area. Holding the leading positions in Huawei, Nokia and Ericsson, he participated in the implementation of ambitious international infrastructural ICTs projects. In 2014-2018, he held office of the Deputy Minister of Communications and Mass Media of the Russian Federation. At present, he serves as President of VimpelCom PJSC.

Ismailov's program is based on promoting by the Union the mutually beneficial initiatives aimed at global development of ICTs, bridging the digital divide, and intensification of the high level dialogue on the introduction of advanced digital technologies in the developing countries. The Russian candidate also considers it necessary to shape the optimal environment for the innovations in the area of telecommunications/ICTs to support the digital transformation of society, to enhance cooperation between ITU members and other telecommunications stakeholders that identify themselves with the organization's strategic aims.

All the way through its 157-year history the ITU has been a powerhouse for the world telecommunications development. However, there is a risk of the International Telecommunication Union becoming an "elitist club" imposing its standards and technologies on the majority (states!) based on minority interests. It would actually destroy traditional approaches to universal effective cooperation in this area under the aegis of the UN. Essentially, the question of the very existence of the ITU as a specialized body of the UN and its future is being decided. Either the organization will retain its universal character and will promote technological development in the interests of all mankind, all countries, regardless of their current level of development. Or it will split into opposing "technological trenches," which will mean the collapse of global digitalization. The "privileged" countries will be able to retain their place in the global technological process, while the vast majority of states will only be left, in one way or another, to pay for the technical domination of the aforementioned.

Viktor GOREGLYAD

Deputy Director-General of Russian Television
and Radio Broadcasting Network (RTRN) – Director of Radio Broadcasting
and Radio Communication Department

ONCE TELECOMS PEOPLE GET CONNECTED, THERE'S NO STOPPING THEM

This summer the attention of Russian media and public became riveted to the International Telecommunication Union (ITU) – a well-known internationally recognized organization which has never been involved in anything that would draw the attention of mass media, or would cause it to shake with spectacular scandals. In a word, it is not the same as FIFA, UNESCO, or CIA. The elections of the ITU's secretary-general, which took place in September, were held with the participation of Russian candidate Rashid Ismailov. Given this, we would like to know more about the ITU and its cooperation with Russia.

- Viktor, You have been a member of the Russian delegation to the International Telecommunication Union for eight years. Could You tell us what the ITU is like now, and what it should be like, if, for some reasons, You think that it is not what it should be?

Delegates at the International Telegraph Conference (St. Petersburg, 1875) (Source: ITU)

- Yes, I have been with the ITU since 2014. I was invited to join the delegation by my colleagues from Radio Research Institute (NIIR). This is our head institute, a research hub of the entire wireless communication industry. For years, NIIR has been the place where the core of the Russian delegation is formed, which is important, because, speaking of the ITU and Russia, one cannot but mention the NIIR. Experts from other enterprises of the industry join in depending on the agenda. Russia is thus represented by a team of highly qualified professionals, so we have something to discuss at joint sessions.

As a member of the delegation I take part in sessions of the 6th Study Group (SG-6) of ITU's Radio Communication Sector and Working Group 6A - «Ground-based delivery of radio broadcasting programs» at SG-6.

The format of the events which are held by the Study Group-6 and its composition make it similar to an international industrial forum on broadcasting services. A forum which is far from ordinary, which is the world's most authoritative and

plenipotent in standardizing television and radio broadcasting. Our legendary colleague Mark Krivosheyev believed that SG-6 is the ITU's most important group, if we are to take into account the number of planet residents whose interests are affected by its decisions.

  - Let's first decide what is the ITU and what is "Study Group" in the context of the ITU.

  - The ITU, which was founded in 1865, is the oldest international organization of all those operating today.

  - Provided we do not take into account monastic orders, Masonic lodges, pirate cities…

  - Well, yes… And would you imagine, throughout nearly 170 years the Telecommunication Union has been evolving, without being subjected to drastic administrative changes. The ITU serves as a good reminder for us as to how people perceived international cooperation in the 19th century. But this is not to say that the ITU is archaic or evokes pathetic tears. It is different in principle. In the 19th century the planet was not such a crammed place as it is now, and the pace of life was much slower, the world was not as global as now. It is really hard to imagine what it was like in those days.

  The appearance of the electric telegraph in the early 19th century inspired European scientists and engineers, the forefathers of present-day communication workers, stirring their creativity. The possibility of transmitting two elementary symbols – a dot and a dash – over a distance immediately led to the idea of engulfing the entire humanity with communication network! Unbelievable, how such a thought could occur to people in those days. It is the same as if the inventor of the wheel began to think of a space flight. But they did come together to set up an organization which would "connect the whole world". Thanks to respect for tradition, the ITU stayed committed to the idea and since 1865 has maintained the slogan: Committed to connecting the world.

- But, you have just said that the world has changed beyond recognition since then and the planet has become a crowded place, with little room… At present, people tend to break apart rather than come together. Or they tap the markets, vying for resources.

- Let's consider the second, more important factor pertaining to the creation of the ITU. This is equally unthinkable: the founders of the organization, even though they had nothing specific or fulfilled to rely on except the electric telegraph, succeeded in figuring out the key principle on which the work of a communication union could hinge: international standardization and coordination. They inferred that successful development of wireless communication technologies and their maximum efficiency and effectiveness depended on compatibility of equipment, the measurement systems which would be common for all, and a fair distribution and mutually beneficial exploitation of the resources needed – in the first place, radio frequencies. They became aware of all this in the middle of the 19th century, when there was *no-th-ing* at all. Now we can see how important these issues are for a smooth functioning of communication networks.

It is the International Telecommunication Union that is the central organ of standardization and coordination in the communication sector on the planet Earth. Given the current state of development, the ITU comprises three large departments – known as "sectors": ITU-D (Telecommunication Development Sector), ITU-T (Telecommunication Standardization Sector) and ITU-R (Radio Communication Sector). Since I work in the radio sector, I do know a thing or two what ITU-R is like and what kind of activity it is involved in, whereas ITU-D and ITU-T are sectors I am less familiar with.

- One tends to feel an onslaught of panic over such mind-boggling abbreviations as: SG-6, SEDM, 6A… Is this common practice for communication and radio workers?

- I cannot see anything horrible in these abbreviations and this terminology. I would like to remind you that business culture in the communication sector took shape when the entire language of "international communication" consisted of dots and dashes.

Study Groups are permanently operating groups within each of the Sectors. The Radio Communication Sector consists of six Study Groups, which serve the needs of radio communication: Spectrum Management (SG1), Radio Wave Propagation (SG3), Satellite Services (SG4), Ground Services (SG5), Broadcasting Services (SG6) and Research Services (SG7).

These groups, in turn, consist of Working Groups. The Radio Communication Sector has six Study Groups and 21 Working Groups. Working Groups are believed to be more mobile, and I think they should undergo changes every four years, so that they could match the changing reality and the ITU's research projects. I, for one, have been a member of Working Group 6A "Ground-Based Delivery of Radio Broadcasting Programs" throughout all my eight years with the ITU.

6A is an internal code within the ITU, there is nothing snobbish or threatening in this code. «Ground delivery» means that a radio signal is not transmitted underground via a cable, and is not transmitted very high above the ground (via satellite). Among the key issues which the group has been trying to address in recent years is transition from analogue to digital radio and protection of radio broadcasting services against interferences from unlicensed devices.

The ITU's working groups gather for two-week sessions twice a year. Before the Covid pandemic these sessions all took place in Geneva. Since 2020 they have been held online. The working day of Study Groups lasts eight hours. Every session ends with a plenary meeting in which all the participants approve documents proposed by groups and commissions. A decision on any document is taken only by consensus. The Russian participants have been working really hard and I am sure they make a remarkable contribution to the projects of the Organization.

*- What are «documents» of the International Telecommunication Union?*

- The ITU produces documents in the format of "Recommendations". Every Recommendation is an impressive piece of research, carried out by a large number of participants, often in several countries. In simple language, a recommendation is … recommendation.

A group of researchers reports to the world that after reflecting on the issue of how, from which side, it would be better to break an egg, they deduced that an egg should be broken on the side, better by using a stapler. It's a thoroughly thought piece of research, provided with all sorts of argumentation, meticulous and voluminous, with reports, protocols, graphs, tables, schemes, etc. That's it. As a result, the world learns about all this and does not stay the same - it changes.

Reports on research, experiments, projects are published at the initiative of the participants. Some of the participants in the Working Group arrive for a regular session with the results of recent research (experiments, trials). In the ITU language, it is known as "contribution".

In SG6 every contribution passes a multi-stage discussion. In general, as you see, all these contributions are all but initiative. But in the course of preliminary hearings the Working Group relies on a filtering method to separate the essential from the non-essential: this is the general agenda of the ITU, projects in the development of telecommunication, which the ITU deems significant. The proposed initiative should fit in with any of the research projects announced for the present period. This helps to maintain control of chaos in the creative thinking of communication workers, and to adjust the progressive development of telecommunication networks. In addition, it provides the criteria for assessing the in-coming proposals: they must possess a certain amount of novelty compared to the already known outcomes. I experienced this myself: it so happened that I joined the Russian delegation with a ready contribution.

- Interesting, could You tell us more about it?
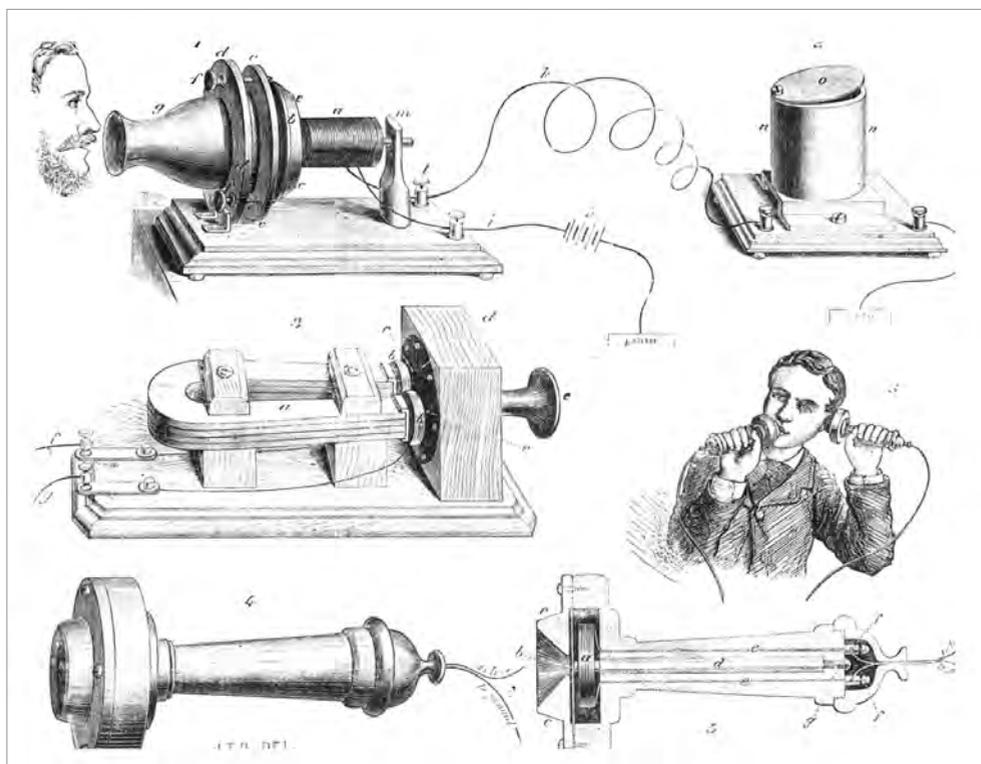
One of the earliest images of Graham Bell's telephone from 1877.
(Source: "From Semaphore to Satellite", ITU)

- It was 2014. Running throughout Russia was a state-initiated telecommunication development program, which focused, in fact, on the transition of the Russian television from analogue to digital technology. All across the country they were creating digital television infrastructure. By 2014 the construction had come to a close in three regions, if I am not mistaken. Some regions, on the contrary, were waiting for their turn. While work was in full swing in 70-75 regions. And even though the campaign ran into a variety of obstacles, it was invariably saved by rescue decisions, which led to an accumulation of vital experience.

I should say that one of the worst headaches of all "ground" communication workers is the deficit of radio frequencies and the ensuing need to effectively manage the resources. And we at RTRN are thinking about it all the time, looking for efficiency boosting options.
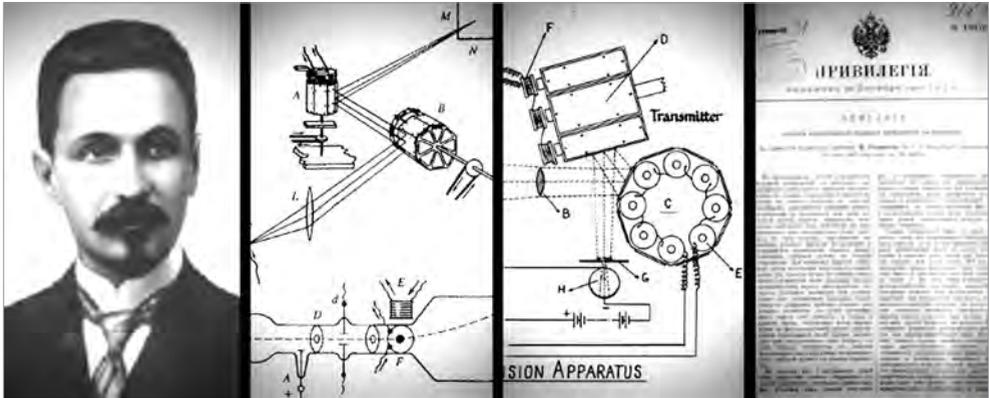
Boris Rosing, author of the first experiments on the creation of television

The network which appeared right before our eyes was designed in such a way that every group of transmitters broadcast a tele signal on one frequency. The neighboring group of transmitters broadcast a tele signal on a different frequency. This model is known as Single Frequency Network, or SFN. Every group of transmitters is a fairly sound one: it could embrace ten, twenty, thirty rebroadcasting transmitters, each covering a radius of approximately fifty kilometers. A vast territory, isn't it? Now, if we name these frequencies A and B, it becomes clear that the first group of tele broadcasting transmitters use Frequency A and does not use Frequency B so as not to create interferences and cause problems with the neighbors. The second groups of transmitters use B, not A, but the frequency is still there, available.

The idea was to make use of frequencies that could not be used for television for technical needs, namely, for the technical transportation of multiplexes to rebroadcasting transmitters. In Russia, they often use space communication, occasionally optic fiber, for these needs. However, a reserve system of delivery is vital if we are to guarantee an uninterrupted operation of the network. Satellites and optic fiber are too expensive to be used for a reserve.

We carried out an experiment in Krasnodar, where we had built a wide-ranging network by 2014. The rebroadcasting transmitters were provided with low-power transmitters which had narrowly-

focused antennas for the technical delivery of tele programs to rebroadcasting transmitters within one SFN-group. In one single-frequency zone Frequency A broadcasts tele programs to the viewers, while another zone is used as a transportation network for technical delivery. The narrow focus of the antennas coupled with the low power of the transmitters (10-20W) guaranteed electro-magnetic compatibility of the equipment, that is, in simple language, absence of interferences for the transmitters which delivered tele signal to the viewers. The trials in Krasnodar confirmed that.

- *…At this point one should expect a triumphant final chord, right? Something like: «The proposed solution is cost efficient in terms of expenditures, it makes it possible to effectively use the frequency resource, boosts the reliability of the tele network, reduces dependency on satellites»?*

- Yes, but the Russian delegation had first to propose a research project within the ITU which would interest the colleagues. And it so happened that we found an American delegation, somewhere "on the fringes" of the ITU, which was trying to find something as well. It should be noted that even in such a sector as communication the Americans are our antipodes. They do everything in a different way. In general, we would turn to anyone for help to suggest a solution to our problems, except the Americans. But an encounter on the fringes of the ITU enabled us to exchange a couple of words and it turned out that the Americans too had arrived at the ITU with a project on the use of low-power transmitters. That project was not the same as ours because the Americans have different traditions, different problems, but if the problems are identical, the solutions are different.

But we coincided on the "low-power transmitters". The Americans told us that the ITU had a sector which focused on the application of low-power television systems and we resolved to join efforts. And even though it was the end of 2014, after the Crimean Spring, nothing could stop us. Once

telecoms people get connected, there's no stopping them. Throughout November 2014 we were busy working out working documentation for the project, and in February 2015 we triumphantly presented our joint Recommendation with a wide range of proposals on the use of low-power television systems. Considering that in their development global communications follow either the American scenario, or the European one, of which Russia is part, it becomes clear that such a joint document can offer a solution to nearly any country. Life demonstrates once again that it's unification, not separation, of efforts, that produces good results.

- And how did the RTRN create a reserve transport network on the basis of this Recommendation?

- Well, it will take time. In Russia, we are required to go to the State Radio Frequency Center for a rare document titled "private solution", a kind of a mandate for the introduction of non-standard technology, which is not stipulated by the existing regulations. ITU Recommendations are, by the way, not legally binding, so it's up to a country to employ or discard them.

- How is that? What's the point of doing all this then?

- Keywords: coordination and standardization. The industry operates in such a manner that Recommendations are vital for its work and countries snap them "like hot cakes" and use them at home. This is inherent with the nature of telecommunication. Communication was designed to unite people. Condition One: compatibility of devices and systems. Compatibility, if not with the planet as whole, for the human civilization is known to be heterogenous, then with part of it. The ITU is not set on putting restrictions on national communication networks. Its Recommendations are wide-ranging, concerning different parameters and interaction standards. And Russia has been taking an active part in it.

- You've told us about Your initiative, Your "contribution", which became ITU Recommendation. But the story You told us is about television. While the Working Group has the word "radio broadcasting" as part of its name. Is it a trick of sorts, or is there something hidden from an outsider?

- That's true. Radio broadcasting is about the radio. Of course, radio is progressing, and we – Russia, RTRN – are part of the process. I run radio communication department at RTRN, and as deputy director-general I oversee the radio development sector. In February 2015 our delegation put forward an initiative on digital radio. But this time, we did not run into the problem of identification and we did not meet outstanding Americans on the sidelines. Smoothly and quickly the project sailed through "contribution" in the Working Group and then a plenary session. Because, I think, it's a good project. It was titled "The Study of Methods of Combined Radiation of Signals of Digital Ground Tele and Radio Broadcasting".

- And could You put it in simpler words?

- Then I will start with an analogue. Digital television enriched our vocabulary with the word "multiplex". Multiplex is a certain number of channels, which are delivered to the user in a package. In Russia, free digital television multiplex comprises 10 channels. Why ten? Why not five or forty? They are all free, anyway.

- So, why?

- This is because multiplex is transmitted via the same frequency band as the old analogous channel before it. One frequency channel – one analogue tele channel. Now, thanks to digital technologies, one frequency channel can comprise ten digital tele channels. It can take even more, but the quality will then be worse. Less than ten is not cost efficient. So, ten is the best option. An analogue television transmitter was the size of a one-room,

*On 15 November 1947,
an agreement between ITU and the newly created United
Nations recognized ITU as the specialized agency
for telecommunications. The agreement
formally entered into force on 1 January 1949.*

or even a two-room flat. While a multiplex transmitter (of ten channels) is about the size of a fridge.

This became a breakthrough in tele and radio broadcasting, in mobile communication, and on a global scale – in frequency regulation and frequency coordination. Every country has a regulating document titled "a frequency-territory plan" which stipulates which service owns which frequency on each square meter of territory. And all of a sudden, all these plans are worth nothing… Just imagine: ten times economy of frequency resources. This phenomenon immediately became known as "digital dividend" and its redistribution began even earlier than the arrival of digital tele networks, which makes it possible to release this dividend not on paper, but de facto. It was in fact followed by a dramatic upsurge in the development of mobile communication. Many deem it all but the main result of the digitalization of television – not only in Russia, but also in the rest of the world.

My colleagues and I continued work looking into the possibility of broadcasting two multiplexes with the help of one transmitter. One of the multiplexes in question was a television one of the DVB-T2 format, the other was a radio multiplex, which means several radio stations in one frequency channel of the digital radio format DRM+. Yes, such a possibility was found and confirmed. This is known as "the method of combined radiation

of the signals of digital ground tele and radio broadcasting". Quite simple, provided you know what is meant, right?

We thoroughly examined this method, tested it out, in full compliance with technical requirements, recorded everything in a protocol, put all the papers in a nice-looking file, and I left for Geneva.

In Geneva, they heard our report in two working groups, plus in a large number of spontaneously called informal round tables, and it seemed to me that they heard about us through word of mouth well before the meetings, as more and more people and delegations turned up for discussions. At the plenary session the house was crammed to capacity. Our report led to the review of a document that had been issued by the ITU before: «Technology and Planning of Digital Ground Tele and Radio Broadcasting». A review of a founding document is quite rare in the ITU practice. The document was amended, re-issued, its term was extended for another four years. Such a decision meant that our technology, in the opinion of the International Telecommunication Union, had changed the approaches to the planning of digital ground tele and radio broadcasting throughout the planet.

- Did the approaches and technologies transform radically?

- The document received one extra line.

- How come? Only one line?!

- Yes, only one.

- What was it?

- In English it was this - «What methods can be used to combine several multiplex channels within one transmission?»*

- And was it worth it?

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*«Какие методы можно использовать для объединения мультиплексных каналов в рамках одной передачи?»

- Yes, it was, I would say it was. Such is our work. For this very sentence the ITU recalled an entire document, put it in and then published the document again. Thus, the entire future of digital tele and radio broadcasting was somewhat transformed, the real "butterfly effect".

- Back to Geneva. What do You mean by the "ITU sidelines"? For diplomats, "sidelines" mean a lot. But technical, production-oriented diplomacy is quite different. Different people, different relations, different interaction. How does it all work in telecommunication?

- People are different, true. And the sidelines are … different. Their role is different as well. But it's equally huge.

Look. I told You that ITU sessions pass decisions by consensus. But where does consensus come from? It won't appear out of nowhere. When a session is under way, and the participants are discussing ideas and experiments of other participants, anyone, who has any objections as to what we do, can take the floor and present arguments against.

Do You know how consensus is identified at Study Group sessions? Consensus is associated with … silence. The house is silent – the decision is passed.

- A mystical picture….

- The same at the group level. Discussion means questions. Questions mean absence of agreement or understanding.

If consensus on a project is not reached, the hearing will be postponed to a later date. It's necessary that questions stop. But how to guarantee that?..

To cut the number of questions to be asked at a session, it's necessary to get them all answered them beforehand. That means meeting with people, holding preliminary hearings and negotiations. The way a group votes is the result of preliminary work that initiators of the project have carried out. At private meetings. On the sidelines.

Incidentally, Mark Krivosheyev repeatedly explained to the colleagues that in the ITU they pass all important decisions on standards on the fringes, at preliminary talks. In order to exclude any unexpected objections at final sessions, Krivosheyev, when he served as SG leader, introduced the practice of preliminary signing off of the document under discussion by representatives of chief negotiating parties. That was in 1982. We would sometimes hunt for signatures on the documents late at night, at the hotel. Those were the 'boudoirs" of telecommunication. But the next day the decisions were passed unanimously. That same year a commission led by Krivosheyev managed to secure an approval for the first common-for-all digital standard. Would You believe it, such a coincidence?

- When You were invited to join the Russian delegation at the ITU, it was led by Mark Krivosheyev. Did this fact influence Your decision? What kind of relationship did You have with the scientist? Do You consider Yourself his student?

- Of course, it affected my decision. There was no way I could have shut my eyes on his presence and made myself believe that he was not there. Of course, I knew that NIIR and ITU meant Krivosheyev, so I was more than happy to seize on the chance of joining that circle.

As a member of the delegation, I did not miss a single opportunity to get him as delegation chief to comment on my projects. Yes, I consider Mark Krivosheyev my teacher. Though, I'm doing my best to keep it secret, I don't want my colleagues to feel upset because they haven't been as lucky. I'm joking, of course.

It seems to me that deep in their hearts every member of the ITU think of themselves as "Krivosheyev's student".

Mark Krivosheyev is still arch-popular within the ITU. He had always been known there as "Professor Krivosheyev". A person whose popularity stretches far beyond the Union, he is remembered as the only individual who was honoured with a memorable plaque in his lifetime. For the ITU, he is an ingenious, highly revered Russian scholar and the most outstanding
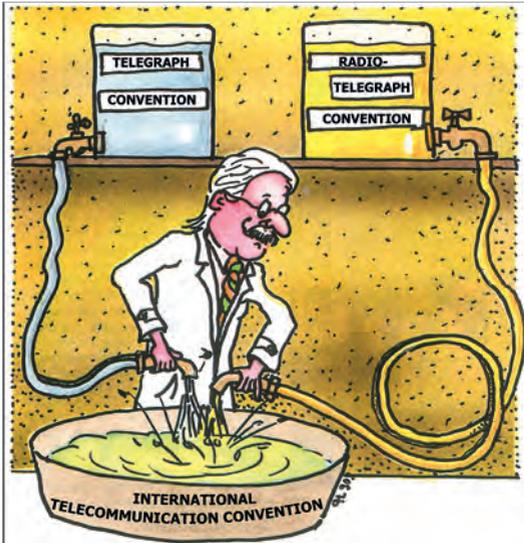
The International Telegraph Convention was combined with the International Radiotelegraph Convention to form the International Telecommunication Convention.
(Source: ITU)

personality in the entire history of the ITU.

There cannot be any other way. For the ITU, Mark Krivosheyev was not just a "model Russian", but a model representative of the ITU proper. He worked for the ITU for 48 years, could You imagine? He devoted to it half of his lifetime and most of his professional experience. Many of our foreign colleagues lived and made their careers "under Krivosheyev", many grew old and retired, but he stayed on.

Meanwhile, no one from the international professional community forgets that he was Russian. He was always given the floor at a plenary session, but it was not a gesture of courtesy or a ritual. As he spoke, he would invariably propose new strategic research projects. He foresaw a lot of things and many of his ideas are waiting for their time. The most important thing is that they are remembered.

- Research and discoveries made by Mark Krivosheyev and his colleagues propelled the entire domestic communication industry to global leadership. He was number one in the area of television technologies in the second half of the 20th century and early 21st century. From the very outset Krivosheyev's work in the ITU can be described as an act of scientific and diplomatic heroism and yielded tremendous authority and glory to the Russian science on the international scene.
As a prominent figure and academic, who made a remarkable contribution to the wellbeing of people across the globe by means of innovations in IT technologies, he was awarded the

ITU150 of the International Telecommunication Union. Besides Krivosheyev, there are only five people in the world who were honored with such an award – wireless mobile connection pioneer Martin Cooper, Internet developer Robert. E Kahn, and Microsoft founder Bill Gates.

In Your opinion, can the scientist's personality grandeur and the scope of his achievements hamper the work and reputation of Russia's present-day representatives in the ITU? Can Krivosheyev's globally renowned high status overshadow in the eyes of foreign colleagues the potential of the new generation of Russian telecoms workers?

- You know, on the one hand, a typical representative of the ITU tends to relate anyone from Russia to the image of Krivosheyev. This is not because foreign experts see nothing else of significance in the Russian telecommunication. This is because Krivosheyev's personality means a lot to them personally, to each of them in person. I've just tried to explain where such attitudes stem from.

So, to my mind, a touch of Krivosheyev genius on the open and energetic faces of representatives of the Russian Communication Administration is not fraught with risks. It's great that the history of communication knows Mark Krivosheyev, it's great that we are his compatriots, it's great that he was from Russia.

At the same time, we must put some things right. Mark was definitely not alone in his status of a genius. He was part of a host of prominent Soviet and Russian scientists, who grew to prominent during his time at NIIR. Among his associates and like-minded co-workers were internationally acknowledged experts Andrei Kucheriaviy, Lev Kantor, Natalya Reznikova, Anatoly Kalinin, Vladimir Minkin, Vladimir Timofeyev (who occupied the post of Director of ITU Radio Communication Bureau from 2003 to 2010), Vladimir Kozlov, Alexander Pavlyuk, Sergei Pastukh, Viktor Strelets and many other luminaries.

And this is what the ITU is fully aware of too.

At present, employees of Russian NIIR are members of the governing bodies of eight Study Groups of the International Telecommunication Union.

ITU Secretary-General Zhao Houlin spoke highly of Mark Iosifovish's colleagues as he congratulated NIIR on the 70th anniversary in 2019.

Russia boasts the most number of approved proposals in the working organs of the ITU Radio Communication Sector.

Russia is also among the top ten countries invest the most in the work of the Radio Communication Sector. Whether this should be seen as an achievement, or as excessive kindness, I don't know.

Our compatriots should also remember and feel proud of the fact that 170 years ago Russia was among twenty countries that initiated the creation of the ITU. Russia has always been in the "top league" and in the vanguard of communication.

- I regret to disappoint You but the ITU is not the oldest international organization on the planet. Data say the International Association of Geodesy (IAG) originated in 1862, earlier than the ITU. But, like the ITU, it was founded with the participation of Russia.

- Yes, it looks like in those years too there were people with clear vision, not only in communication. They must have understood that no matter how huge the planet is, they should be prepared to set a boundary with a neighbor at any time. It's really important. I wish them luck.

- I chose to change the topic because our talk was becoming too serious. Could You recall any funny episodes in the work on the standardization and coordination of communication? Situations which You would consider funny?

- I'll tell You one story. I don't know if You will find it funny. As You know, radio frequencies are a limited natural resource. A short-wave band (SB) makes a specific part of the radio frequency spectrum: a short-wave signal can go round the entire planet.

The short wave's superpower was discovered by radio amateurs in the 1920s and this discovery provided such a powerful impetus for radio lovers that they are still as active as ever, despite mobile communication, the Internet. The international community, or movement, of radio lovers is what it's all about. But nowadays it would be wrong to call it amateur: it was known as amateur in the days when there was no other type of radio connection. In general, one must possess specific skills to take part in such a movement. So, most radio lovers are highly qualified professionals, or, as they say now, "experts" with vast knowledge. At present, the so-called "radio amateurs" have got the once scandalous and so much sought-after short-wave band at their disposal. This community has their own language of code words which are used during communication sessions, for example, OM is "buddy", VFB is "very well", XYL – "wife". And to say good-bye they broadcast to one another «73», which means "best wishes". I am a radio lover too, with nearly half-a-century-long experience… But the short wave story is not about this.

For years, short-wave band remained the most wanted part of the radio spectrum. But nobody managed to devise a frequency assignment method, so frequencies are shared and there are no national frequency plans.

Nevertheless, the world did have to come to spontaneous global coordination due to the disproportionately high level of mutual interferences between sources of signals from the stations. Historically, every nation was assigned short-wave radio frequencies at High Frequency Coordination Conferences, or HFCC.

Sometimes there were "collisions". When the participants could not come to agreement, they started a sort of arm-wrestling "under the table". Used as the trump card was a superpower transmitter. Soviet specialists switched the transmitter into the disputable frequency and a couple of months later, maximum in half a year, the weakened and deafened opponent left the frequency. In radio men's jargon it was known as "to blow through the frequency".

After the end of the Cold War between the USSR and the USA dialogue in radio communication improved, so Russia is no longer using a short-wave band for radio broadcasting and has long stopped resorting to such problem-solving techniques.

HFCC is currently a non-governmental non-profit association, which entered the ITU as a collective member.

This means a challenge for the new secretary-general of the ITU: to resolve the problem of nearly one hundred years by devising a method of assigning frequencies in a short-wave band.

- It would be interesting to know what You can say about the current state of the ITU and the communication industry as a whole.

- We are going through a fairly memorable time……I wouldn't describe it as enjoyable, though. ITU's working groups are being filled with producers of different kinds of telecommunication equipment, most of whom represent high-profile trans-national corporations. In addition to 193 countries, ITU comprises more than 900 collective members: international and regional organizations, mobile operators, producers of telecommunication equipment, broadcasters (fore example, American CBS, Japanese NHK, British BBC), academic organizations, scientific and educational institutions (for example, the Bonch-Bruevich Saint Petersburg State University of Telecommunications).

Now, in the second decade of the 21st century, we are witnessing a growing interest in from telecommunications and IT-giants, such as Samsung, Sony, Philips, and many others in issues which could yield a financial outcome, such as images with High Dynamic Range и superhigh resolution TV.

The producers have been keeping a close eye on standardization processes and tendencies. Their interest is evident, no need to explain. The ITU, in turn, is trying to maintain neutrality as a platform for reaching global consensus. But it's different with the corporations – once their interest is up, their influence should go up as well. They are not content with the episodic role of one of a thousand ITU members, they are looking for ways to operate
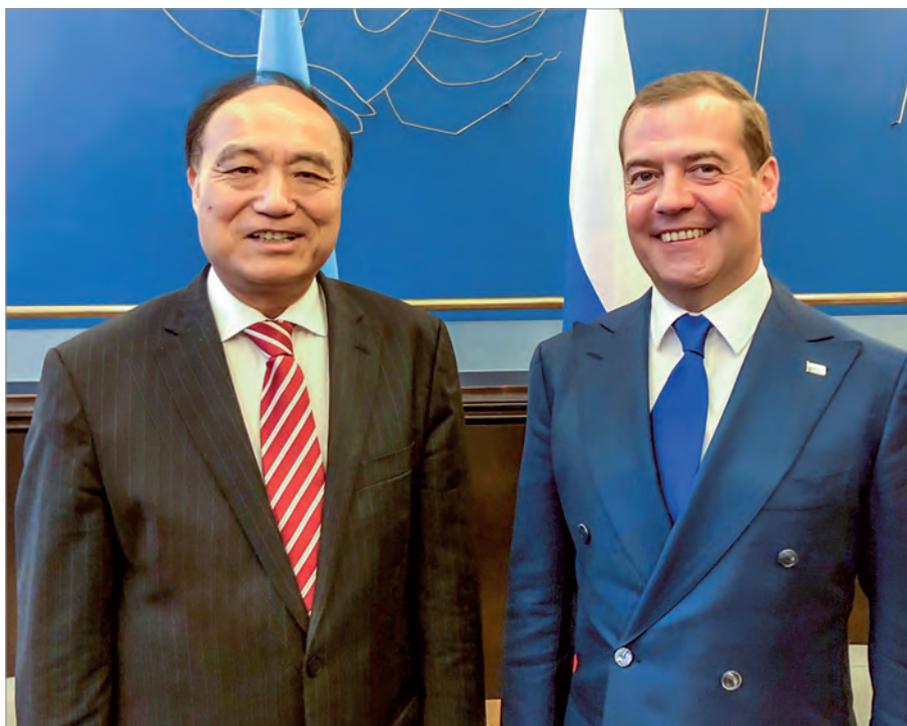
ITU Secretary General Houlin Zhao visiting Moscow

through national delegations, and of course, they are able to find these ways, if we are to remember that the delegations are not spoiled by money.

Ever more often, ITU discussions reveal the following situation: when a corporation which has invested in developing a particular technology for the improvement of television or other equipment is trying to guarantee a green light for the technology in question.

In fact, Mark Krivosheyev said that it had always been a challenge to coordinate the positions of all parties involved.

A lose-lose situation occurred in the late 1990s during talks to approve a standard for High-Definition TV (HDTV). The proposals were all conflicting ones, the participants could not pick a favorite, at stake were the interests of the producers of the equipment and the broadcasters, who had invested millions of dollars in different HDTV projects.

The Americans based their arguments on the development of quality characteristics of Hollywood video products. They had

even brought with them the director George Lukas, who impressed the telecoms workers by a story about plans to shoot a sequel to The Star Wars.

But our dear Mark Krivosheyev cited data that it was Indian Bollywood, not American Hollywood, that had gained top positions in the film production industry by then. Bollywood had been rolling out more films than the United States and Europe together because it produced low-budget movies in large quantities. Professor Krivosheyev urged everybody to strike a compromise and take into account the interests of tele companies and film producers in different parts of the world. And the Americans did agree! As a result, the parties concerned reached a compromise on the technical parameters of the HDTV standard.
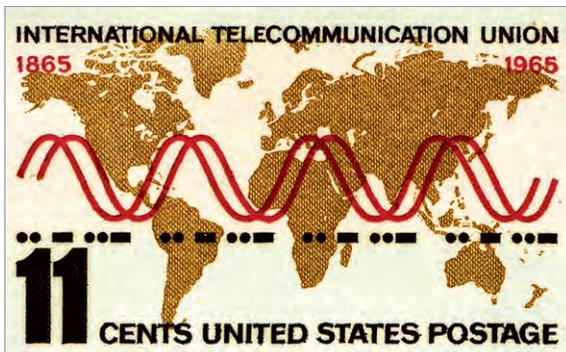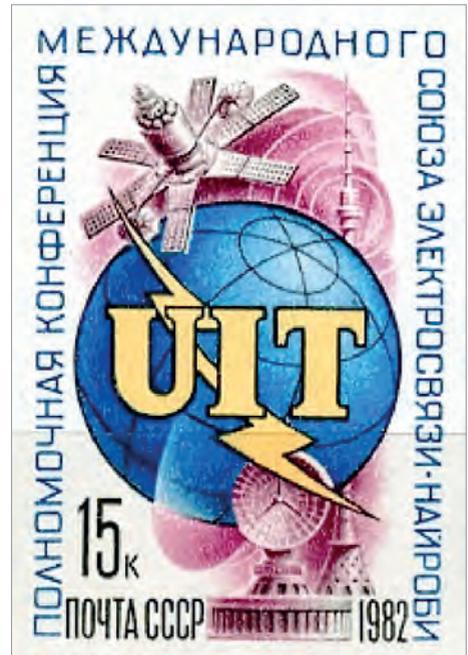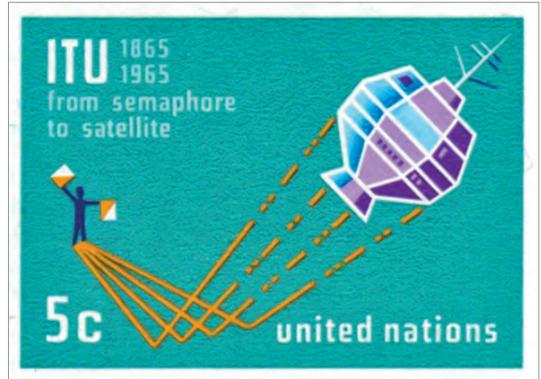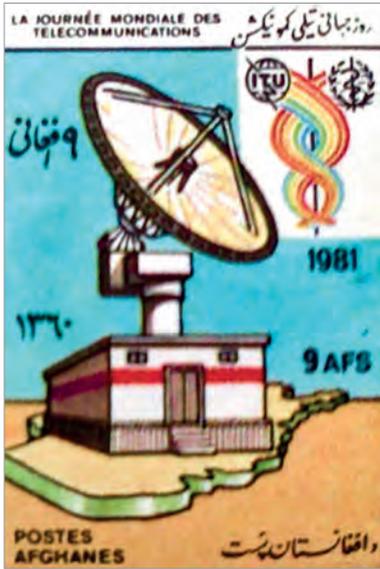
- Now, it's become somewhat difficult to reach an agreement with the USA on a variety of issues…

- Yes, I think that in the near future the ITU platform could turn into a scene of very serious battles.

- Thank You for a productive interview.

STAMPS INTRODUCED BY ITU

Olga MELNIKOVA

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INTERNATIONAL TELECOMMUNICATION UNION:TECHNICAL REGULATOR OR ARENA FOR NEW CONFRONTATION?

Rapidly developing, increasingly sophisticated information and communication technologies (ICTs) have not only transformed human space, making it limitless, but also changed the system of international relations.

The ICT sphere has become the main arena of geopolitical confrontation. Digital resources are gradually becoming as significant as geopolitical factors and military capabilities. Even a comparatively small state can become a major player in the global digital space if it possesses cutting-edge cyber technologies. ICTs are an important national economic growth factor. Today, a state's level of ICT development determines its international status.

Disruptive ICT development stirs a desire to acquire strategic advantages. Strategic stability is ensured not so much by the military parity of the main actors in international relations as by their technological parity.

There are major differences between Russia, China and the United States in terms of their national power and influence, but these three nations are the main global political and military

players. Russia and China oppose global domination by the US, including in cyberspace.

ICTs are becoming a strategic aspect of the current US-Chinese confrontation. China is seeking technological independence and trying to catch up with the US technologically. Washington is already alarmed by China's development of its own digital technologies and its ambition to be the world's technology leader. China is already ahead of the US in creating certain civilian network technologies – for example, 5G. The European Union, a strategic partner of the US, is interested in China's 5Gtechnology, and this is making the US even more anxious. As a result, the US has unleashed a large-scale trade war against China that is also affecting the regulation of technology standards.

The EU, despite being a key ally and partner of the US, obviously has no desire to get too deeply involved in the US-Chinese confrontation for fear of losing the Chinese market and mutually beneficial European-Chinese ties.

US-Chinese antagonism is becoming a fundamental feature of American-Chinese relations and will most likely escalate and play a key role in 21st-century international politics.

The increased political and technological rivalry between the US and China is leading to new Chinese-developed technology standards and solutions that are not always to the liking of the West. This situation is undermining the leading positions of the US, having stripped it of its status as the world's technology standard setter and weakened the global role of its high-tech industries. Conversely, China's positions will be strengthened by its own ICT achievements.

It is their technological rivalry that explains clashes between the US and China within the framework of the International Telecommunication Union (ITU),[1] one of the oldest international organizations and a specialized UN agency in the ICT field.

The ITU allocates global radio spectrum and satellite orbits, develops technical standards that ensure that networks and technologies seamlessly interconnect, and strives to improve access to ICTs in underserved communities worldwide. The ITU seeks to promote international cooperation in the interests of

developing countries, including by developing telecommunication networks.

Given the constant growth in demand for the limited resources of radio spectrum and orbits, it is a priority of the ITU to develop efficient methods for allocating the radio spectrum, rules for its use, and technical operation principles for radio systems.

Put simply, it would have been impossible to develop any of the mobile network generations, audio and video compression algorithms, and Internet protocols without ITU involvement.

The ITU's members include 193 states and some 700 associate members from private telecom companies, universities, and nongovernmental organizations. The ITU is a unique global public-private partnership platform.

The ITU's top policy-making body is the Plenipotentiary Conference, which is usually held once every four years. All member states may attend.[2] The conference makes strategic decisions; approves amendments to the ITU Constitution and Convention; approves the ITU budget; and elects the ITU secretary-general, deputy secretary-general, and directors of the bureaus of the ITU's three sectors. It also elects the ITU Council and Radio Regulations Board, which set guidelines for the ITU for the next four years.

The 2018 Plenipotentiary Conference reelected Houlin Zhao (China)

as secretary-general, Malcolm Johnson (Great Britain) as deputy secretarygeneral, and Chaesub Lee (South Korea) as director of the ITU Telecommunication Standardization Bureau. Mario Maniewicz (Uruguay) and Doreen Bogdan-Martin (USA) were elected director of the Radiocommunication Bureau and director of the Telecommunication Development Bureau, respectively. The terms of office of any of the elected positions in the ITU General Secretariat are limited to no more than two four-year terms.

The ITU's day-to-day activities between Plenipotentiary Conferences are managed by the ITU Council,[3] which consists of representatives of 48 states and deals with a wide range of matters associated with implementing the ITU's strategy in the constantly changing global telecommunications environment.

The General Secretariat, which reports directly to the secretary-general and deputy secretary-general, is in charge of organizing Plenipotentiary Conferences and was the organizer of the World Conference on International Telecommunications (WCIT), held in 2012. The General Secretariat also oversees the World Telecommunication Policy Forum, which meets as needed; the ITU Council; and ITU Telecom, a global platform bringing together governments and private companies to expedite the industrial adoption of ICT innovations.

Today, key ITU activities are extremely politicized. Heated battles usually take place on the sidelines of Plenipotentiary Conferences, The ITU's commitment to connecting everyone in the world and supporting the right of every individual to communication in a secure digital environment should prevent the organization from being used as a platform for political battles or a tool for pursuing anyone's ambitions for technological domination.

Sectoral conferences, Council sessions, and meetings of Council working groups. There may even be arguments over such trivial matters as whether some resolution should or should not mention artificial intelligence or the Internet of Things. The bottom line is that the West is going out of its way to curb the powers and influence of the ITU.

The COVID-19 pandemic has had a marked impact on the ITU's activities, upsetting its routines. Practically all events held by the Union since February 2020 have been virtual. Council sessions scheduled for 2020 and 2021 were canceled and replaced by virtual meetings of advisers, a format that has proven extremely ineffective. All key points of controversy have been put on hold and remain unresolved. Between 150 and 180 annual events take place in an online format, which makes it difficult for member states to get to the essence of the issues they are examining.

Today's delicate balance, achieved largely thanks to Zhao, who has managed to avoid both painful revolutionary reforms and stagnation in the work of the ITU, may be upset very soon.

The political dimension of the ITU's activities should not be underestimated, even though one would assume the Union to be an international organization dealing with purely technical matters.

It may be fair to say, paraphrasing Nathan Mayer Rothschild, that whoever controls the ICT realm controls the world.

The ITU is not directly involved in Internet governance. It has a purely technical mission of ensuring the smooth functioning of the Internet.

In the context of the ever-increasing confrontation in the digital space, the United States strives to retain the possibility of technological dominance and a de facto monopoly on Internet governance.

The Tunis Agenda for the Information Society, adopted in 2005 by the World Summit on the Information Society (WSIS), set a goal of creating an Internet governance system that would involve the equal participation of states. The Council Working Group on International Internet-related Public Policy Issues (CWG-Internet) was set up by the ITU Council to oversee activities to attain this goal. This means that the ITU does have Internet governance on its agenda. But CWG-Internet's efforts have produced no practical results because of all kinds of barriers put up by the US and its partners.

The main role in Internet governance is played by the Internet Corporation for Assigned Names and Numbers (ICANN), but the Internet is effectively under the monopoly control of the US administration, which de facto controls ICANN, even though officially ICANN has been a nonprofit organization since 2009 and is accountable to its global multistakeholder community – i.e., to nobody in particular.

Russia and China, as part of their strategic partnership, consistently advocate the internationalization of Internet governance. They insist on a more prominent role for states in governing the Internet and on the sovereign right of states to regulate their national segments of the Internet.

The optimal solution might be to entrust Internet governance to the ITU, which possesses the necessary expertise, but this would counter US ambitions to control the Internet, and Washington would most likely block any initiative to that effect.

The Americans, moreover, are seeking undivided control of the ITU. US national Doreen Bogdan-Martin, director of the Telecommunication Development Bureau, has been nominated to

run for ITU secretary-general in an election to be held at the next Plenipotentiary Conference in fall 2022.

Her victory would mean that the US would hold all levers of influence in the ICT sphere. This may become a new threat to international information security and upset the already fragile balance that is maintaining it.

Even as director of the Telecommunication Development Bureau, a politically sensitive post, Bogdan-Martin wields influence over various states, interacting with them through ITU regional offices and giving developing countries generous promises like the ones that she made at the 2017 World Telecommunication Development Conference in Buenos Aires that still have not been kept.

Rashid Ismailov, the Russian nominee for secretary-general, holds a radically different stance on Internet governance. As someone with extensive experience serving in senior roles with high-tech companies (Ericsson, Nokia, and Huawei), as a former Russian deputy communications minister (2014-2018), and as the current president of VimpelCom, a Russian provider of mobile and telecommunication services under the Beeline brand, Ismailov believes that humans must be at the center of all technology.

Ismailov's election program is based on the notion that the digital revolution, which made previously expensive and complex technologies broadly accessible, has created a lot of potential for conflict, and the main challenge today is to adapt and humanize these technologies and prevent such conflicts.

Ismailov believes that it should be the mission of the ITU to work to rebuild public confidence in ICTs by minimizing the causes of crises stemming from their use. Everyone needs to realize that technological development is not an end in itself but a means of improving people's quality of life and strengthening their security, the Russian candidate emphasizes. He wants the ITU to seek equal opportunities in the ICT field and to work to prevent economic inequality among countries. The ITU and the international community as a whole must work to bridge the digital divide, he believes.

The Russian candidate wants the ITU to become more involved in multilateral efforts to build cybersecurity guarantees and

ensure stability in cyberspace. By 2030, every individual in the world should have access to ICTs and the Internet, he believes. According to him, the ITU's resources should be used to help build information security guarantees, improve health services, and create uniform standards for artificial intelligence. Closer cooperation among ITU member states and deeper involvement of private companies and scientific institutions are necessary conditions for the successful work of the ITU, he argues. His election platform, which reflects the Russian position on the ITU's role, aims to promote depoliticized discussions and cooperation among all stakeholders.

By nominating an experienced, knowledgeable, unimpeachable, and unaffiliated candidate for ITU secretary-general, Russia is offering to be the guarantor of the security of ICT users all over the world, protecting them from rampant threats with enormous destructive potential. Russia made such an offer earlier by nominating Valery Timofeyev as the Russian candidate for director of the ITU Radiocommunication Bureau.[4] Timofeyev won that election.

ITU support programs for national telecommunication projects are extensive and diverse. It is essential, however, to prevent the global telecommunication standardization mechanism from being used in ways that would infringe on the national interests of any country.

Largely owing to Russian diplomatic efforts, information security issues remain on the ITU's agenda. The ITU is adhering to its Global Cybersecurity Agenda (GCA), launched in 2007 by then ITU secretarygeneral Hamadoun *Touré* (Mali) despite all Western attempts to have it scrapped. In April 2020, on Zhao's initiative, consultations were held on planned guidelines for implementing the GCA that are due to be adopted at the next in-person session of the ITU Council. It was decided not to discuss them in a virtual format, since the matter is considered too important to be discussed online.

The 20-year work to develop rules of the game for cyberspace is acquiring a new form. Cooperation in the ITU format between governments and private businesses helps develop policies, legal principles, and international technical

standards, and exchange experience in order to ensure wider access to ICTs.

Public-private partnership has always been a key concern of the ITU. Now more than ever, the ITU must ensure its sustainable development in close collaboration with government agencies, academia, and other stakeholders in light of combined efforts to implement appropriate regulations that promote investment, innovation, and widespread joint use.

The ITU's commitment to connecting everyone in the world and supporting the right of every individual to communication in a secure digital environment should prevent the organization from being used as a platform for political battles or a tool for pursuing anyone's ambitions for technological domination.

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[1] The ITU was established in 1865 as the International Telegraph Union. Back then, telegraphy was the only long-distance communication technology. Russia was one of its founding nations. The Union acquired its current name and status in 1932, when it merged with the International Radiotelegraph Union, an organization set up in 1906. Since 1947, the ITU has been a UN specialized agency headquartered in Geneva.

[2] The next Plenipotentiary Conference is due to be held in Bucharest, Romania, from September 26 to October 14, 2022.

[3] Russia is a permanent member of the Council.

[4] Timofeyev held two terms as director of the Radiocommunication Bureau, being first elected in 2002 and reelected in 2006. Unanimous support for his candidacy in the 2006 election reflected appreciation of his first-term performance.