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| **Radiocommunication Advisory Group** | C:\Users\murphy\AppData\Local\Temp\Temp1_ITU logo Entire package.zip\jpg\ITU official logo_blue_RGB.jpg | |
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|  | | **Addendum 1 to Document RAG/44-E** |
| **4 March 2022** |
| **Original: English** |
| Director, Radiocommunication Bureau | | |
| report TO the twenty-NINTH meeting of the radiocommunication advisory group | | |
| STUDY GROUPS ACTIVITIES | | |

# 1 Working methods

Study Groups (SGs) activities were pursued within a stable Study Groups and Working Parties (WPs) structure with some modifications to take into account the decisions of the First Session of the Conference Preparatory Meeting for WRC-23 (CPM23-1). Working methods were satisfactorily applied in accordance with Resolution ITU‑R 1 and the associated Guidelines for the working methods, which were updated in 2020.

# 2 Access to meeting documents

In line with the provisions of Resolution ITU‑R 1, meeting documents are posted by SGD staff within one working day “as received” on a webpage established for this purpose, and the official versions are posted on the website within three working days.

# 3 Electronic working facilities

There is continuing emphasis on the use of electronic facilities, which has brought considerable benefit to delegates as well as a significant reduction in paper consumption.

## 3.1 SharePoint website

Access to documentation during meetings via a dedicated SharePoint website is the standard practice.

SharePoint sites for Correspondence and Rapporteur Groups are also used extensively in the periods between the WP meetings.

## 3.2 File synchronization

The file synchronization facility has been updated for all SG/WP meetings to facilitate access to the most recent versions of documents during meetings and to the meeting room assignments.

## 3.3 Online list of participants

Online versions of the lists of participants for all SGs and WPs meetings have been implemented with access to the online version restricted to TIES users. The dynamic list can be searched based on parameters such as name, member and position in the delegation.

## 3.4 Remote participation /Virtual meetings

Due to the exceptional circumstances caused by the Coronavirus (COVID-19) outbreak, it was decided to prioritize the need to ensure the health and safety of all participants and to guarantee adequate levels of participation. Therefore, all the meetings of the ITU-R SGs and their WPs, including Task Group (TG) 6/1, have been held fully virtual as of April 2020 up to the present date.

All the meeting arrangements have been made in agreement with the respective ITU-R SGs management teams. ITU Member States have been consulted whether the SGs meetings could be conducted exceptionally in English only. Therefore, most of the SGs meetings have been held in English only. As of November 2021, it was decided to resume the SGs meetings with interpretation in the six UN official languages. The platform used for the meetings in the six UN official languages was Zoom.

The Bureau has investigated which platform(s) could best respond to the needs of the SGs and WPs meetings and identified “GoToWebinar” and “GoToMeeting” as the platforms to be used for the WPs and Task Group (TG) 6/1 meetings. Following further development and alignment of the electronic tools at ITU level, platforms like Zoom or Interprefy have also been used, when the situation permitted such use. As of March 2022, ITU-R Study Groups will gradually use Zoom more as much as possible in order to align the use of the same platform across ITU.

Taking into consideration that technical problems may happen at any time during the virtual meetings and in response to the Radiocommunication Advisory Group (RAG)’s request, each WP has identified one or two Vice-Chairmen, who would follow-up closely on the work of their respective Groups and should be ready to take over the role of the Chairman, if needed.

Audio webcasts of all available languages have been provided during the plenary sessions of all SGs and WPs meetings.

As a result of the time zones associated with the geographical locations of the participants of these virtual meetings and the need to observe acceptable working hours, these working hours were severely limited compared to those of in-person meetings. Due to this time limitation during the virtual meetings, a large number of Correspondence Groups (CGs) have been newly established to progress the work between meetings. Rapporteur Groups (RGs) and Inter-Sector Rapporteur Groups (IRGs) continue their activities.

Working hours during e-meetings remain a sensitive issue. In an attempt to share the burden of working hours for participants in Regions 2 and 3, WPs 3J, 3K and 3M meetings in April 2021 were held outside the core hours in Geneva (i.e., from 00:00 to 03:00 am). This arrangement has also been followed by some of their Correspondence Group online discussion sessions for which the hours were rotated by eight hours after each session. It is to be noted that this attempt has highly increased manpower costs due to the engagement of non-ITU staff to assist the meetings from other ITU services.

## 3.5 Study Group webpages

In alignment with the ITU policy, updates to webpages are continuously performed in order to provide necessary information to delegates.

The list of CGs/RGs can be found on each SG main page under a specific link and they are aligned for all SGs. Following the link for each CG/RG, the user can access the information about the group name, the SharePoint page, the Rapporteur/Chairman/Convener, the mailing list, the archive, etc. and other necessary information.

## 3.6 Captioning

Since December 2013, all SG meetings have been provided with live captioning in English. Feedback on this facility has been generally positive because it is also an aid to delegates in following discussions. However, the accuracy of the captioning, particularly with respect to frequency bands, radiocommunication acronyms and delegate names tends to be poor.

# 4 Participation

There has been a considerable increase in the level of participation in ITU-R SGs and WPs meetings since 2003 particularly, in 2020 and in 2021 when all meetings have been held electronically. This is very encouraging, but at the same time it might create some difficulties if those numbers are used to estimate future participation in in-person meetings.

Participation in the largest groups can now exceed 600 attendees. The average participation per meeting is now of the order of 235 participants (see Figure 1 below).

Figure 1

General average participation to ITU-R Study Group/  
Working Party meeting per year since 2003

\* Higher values corresponding to a year with fewer meetings but with more participants, e.g., CPM‑2.

\*\* Higher values corresponding to a year where most of the meetings have been held electronically.

# 5 Meeting rooms

The shortage of meeting rooms at ITU Headquarters continues to hinder the effective planning of meetings. This problem has been exacerbated by the following factors:

– the increased number of meetings being arranged by all of the Sectors and the General Secretariat;

– the shortage of meeting rooms with a capacity of more than 120 participants;

– the need to avoid overlap and clashes of meeting dates;

– the limited availability and very long lead times required for bookings in alternative facilities, such as CICG;

– the demolition of Varembé building and the construction of the new ITU building, which will have an impact on a large number of meeting rooms, as during the demolition, the meeting rooms in the Tower and Montbrillant buildings will not be useable due to the noise.

Consequently, in the coming years an increasing number of meetings will need to be held at other locations outside ITU or as a mixture of physical and remote participation. To that end, offers from the membership to host SGs/WPs meetings during this period will be particularly welcome, if the situation associated with the pandemic allows.

# 6 Activities in the Study Groups

Some of the activities and other ongoing standardization studies in each SG are described below. The table below summarizes the ITU-R SGs status of studies carried out since RAG-21 as well as the production of ITU-R Recommendations and ITU-R Reports approved since then.

| Study Group | Status of studies | | |  |
| --- | --- | --- | --- | --- |
| Recommendations ITU-R approved | Reports ITU-R approved | Questions ITU-R approved | Handbooks ITU-R approved |
| **SG 1** | SM.2140-0, SM.2139-0, SM.575-3 | SM.2486-0, SM.2392‑1, SM.2351‑3, SM.2303‑3, SM.2153‑8, SM.2093‑4 | 242/1 |  |
| **SG 3** | P.2108-1, P.2040-2, P.2001-4, P.1812-6, P.1411-11, P.1409‑2, P.1407-8, P.1238‑11, P.1144-11, P.833‑10, P.619-5, P.534-6, P.530‑18, P.528-5, P.527-6, P.452-17, P.372-15, P.311-18 | P.2406-2, P.2346‑4 |  |  |
| **SG 4** | M.1902-2, M.1901-3, M.1787-4, S.2131-1, S.1714-1 | BO.2497-0, M.2496-0, M.2220-1 |  |  |
| **SG 5** | F.2005-1, F.1777-3, F.749-4, F.637-5, F.595‑11, M.2150-1, M.2092-1, M.2012-5, M.1824-2, M.1796-3, M.1465-4 | M.2501-0, M.2500-0, M.2499-0, M.2498-0, M.2291-2, M.2480-1 | 263/5 | Land Mobile (including Wireless Access) - Volume 4: Intelligent Transport Systems  Handbook on International Mobile Telecommunications (IMT) |
| **SG 6** | BS.2143-0, BS.1114-12, BT.2077-3, BT.2075-4, BT.2073-2, BT.2036-4, BT.2033-2, BT.1871-3, BT.1203-3 | BS.2494-0, BS.2493-0, BS.2384-2, BT.2495-0, BT.2485-0, BT.2470-2, BT.2469-2, BT.2468-1, BT.2467-1, BT.2447-2, BT.2446-1, BT.2420-3, BT.2408-4, BT.2400-4, BT.2390‑10, BT.2383‑3, BT.2343-7, BT.2302-1, BT.2301-3, BT.2267-11, BT.2254‑5, BT.2245-9, BT.2140‑13 | 132-6/6 | Handbook on Digital Terrestrial Television Broadcasting networks and systems implementation |
| **SG 7** | RA.1031-3, RS. 2105-2, RS.1861-1, SA. 2142-0, SA. 2141-0 | RA.2259-1, RS.2492-0, RS.2491-0, RS.2490-0, RS.2489-0, RS.2068-2, SA.2488-0, TF.2487-0 | 258/7, 259/7 |  |

## 6.1 Study Group 1

SG 1 is continuing to develop ITU-R Recommendations, Reports and Handbooks related to spectrum management principles and techniques, general principles of sharing, spectrum monitoring, long-term strategies for spectrum utilization, economic approaches to national spectrum management, automated techniques and assistance to developing countries in cooperation with the Telecommunication Development Sector. Its studies also include methods for identification and elimination of interference, unwanted emissions, maintenance of data dictionary, spectrum redeployment, spectrum use measurement, unlicensed and shared uses of spectrum, dynamic spectrum access, smart grids and wireless power transmission.

At the last meeting of SG 1 held online in June 2021, following the resignation of Mr Kibet Boruett (KEN), Mr Bin Liu (CHN) was appointed as the new Chairman of WP 1B and Ms. Tatiana Sukhodolskaia (RUS) was appointed as the new Vice-Chairman of WP 1B to replace Mr. Bin Liu in this position.

WPs 1A, 1B and 1C met online in May-June and in November 2021. Since RAG-21, one new ITU‑R Question, two new and one revised ITU-R Recommendations were developed and subsequently adopted and approved. SG 1 also approved one new and five revised ITU‑R Reports.

Question ITU-R:

– 242/1 “Spectrum management framework for the introduction of Ground- and Wall- Penetrating Radar (GPR/WPR) imaging systems”

Recommendation ITU-R:

– SM.2140-0 “Performance evaluation of mobile direction finders in operational environment”

– SM.2139-0 “Test procedure for determining the accuracy of TDOA systems”

– SM.575-3 “Protection of fixed monitoring stations against interference from nearby or stong transmitters”

Report ITU-R:

– SM.2486-0 “Use of commercial drones for ITU-R spectrum monitoring tasks”

– SM.2392-1 “Applications of wireless power transmission via radio frequency beam”

– SM.2351-3 “Smart grid utility management systems”

– SM.2303-3 “Wireless power transmission using technologies other than radio frequency beam”

– SM.2153-8 “Technical and operating parameters and spectrum use for short-range radiocommunication devices”

– SM.2093-4 “Guidance on the regulatory framework for national spectrum management”

The next meetings of SG 1 and its WPs are scheduled from 28 June to 8 July 2022.

## 6.2 Study Group 3

In furthering its work on propagation measurement, data analysis, modelling and prediction in various parts of the spectrum up to 375 THz, thereby laying the foundation for the design of radiocommunication systems and the assessment of interference, SG 3 continues to revise or develop new recommendations, reports and handbooks under its purview. SG 3 and its working parties also continue to provide assistance to all other ITU-R SGs on radio wave propagation prediction aspects, most notably those relating to system design and sharing studies, as often required in support of work on WRC agenda items. Eighteen revised ITU-R Recommendations were adopted and approved since RAG-21. Two revised ITU-R Reports were approved by SG 3 during its last meeting. Six ITU‑R Recommendations were also editorially amended.

Taking into account suggestions made by the RAG meeting in May 2020 and Chairmen/Vice‑Chairmen meeting in June 2020, WP 3M appointed a second Vice-Chairmen, Prof. Leke Lin (CHN). SG 3 endorsed this appointment.

In order to progress with their work, WPs 3J, 3K, 3L and 3M established several additional Correspondence Groups, which resulted in an important increase of their working hours between official meetings. This is the continuing working practice of these Working Parties, which have used Correspondence Groups in this manner for more than a decade, particularly noting the fact that these Working Parties meet usually only once a year and that the topics of work sometimes span periods of longer than five or even ten years in preparation. It should therefore not be seen that the use of Correspondence Groups in this manner has been followed specifically and only due to the situation created by the COVID-19 pandemic.

The P-series recommendations remain the most popular of all ITU-R series of recommendations, with 411 176 downloads compared with 405 769 downloads of the second most popular series, which reflects its importance to all users of radio systems within the ITU and the greater radio communications community.

Recommendation ITU-R:

– P.2108-1 “Prediction of clutter loss”

– P.2040-2 “Effects of building materials and structures on radiowave propagation above about 100 MHz”

– P.2001-4 “A general purpose wide-range terrestrial propagation model in the frequency range 30 MHz to 50 GHz”

– P.1812-6 “A path-specific propagation prediction method for point-to-area terrestrial services in the frequency range 30 MHz to 6 000 MHz”

– P.1411-11 “Propagation data and prediction methods for the planning of short-range outdoor radiocommunication systems and radio local area networks in the frequency range 300 MHz to 100 GHz”

– P.1409-2 “Propagation data and prediction methods for systems using high altitude platform stations and other elevated stations in the stratosphere at frequencies greater than about 0.7 GHz”

– P.1407-8 “Multipath propagation and parameterization of its characteristics”

– P.1238-11 “Propagation data and prediction methods for the planning of indoor radiocommunication systems and radio local area networks in the frequency range 300 MHz to 450 GHz”

– P.1144-11 “Guide to the application of the propagation methods of Radiocommunication Study Group 3”

– P.833-10 “Attenuation in vegetation”

– P.619-5 “Propagation data required for the evaluation of interference between stations in space and those on the surface of the Earth”

– P.534-6 “Method for calculating sporadic-E field strength”

– P.530-18 “Propagation data and prediction methods required for the design of terrestrial line-of-sight systems”

– P.528-5 “A propagation prediction method for aeronautical mobile and radionavigation services using the VHF, UHF and SHF bands”

– P.527-6 “Electrical characteristics of the surface of the Earth”

– P.452-17 “Prediction procedure for the evaluation of interference between stations on the surface of the Earth at frequencies above about 0.1 GHz”

– P.372-15 “Radio noise”

– P.311-18 “Acquisition, presentation and analysis of data in studies of radiowave propagation”

Report ITU-R:

– P.2406-2 “Studies for short-path propagation data and models for terrestrial radiocommunication systems in the frequency range 6 GHz to 450 GHz”

– P.2346-4 “Compilation of measurement data relating to building entry loss”

The next block meeting for WPs 3J, 3K, 3L and 3M is planned from 30 May to 10 June 2022 and that of SG 3 on 13 June 2022.

## 6.3 Study Group 4

SG 4 is continuing to study fixed, mobile, broadcasting and radiodetermination-satellite systems and networks characteristics, air interfaces, performance and availability objectives as well as sharing of orbit/spectrum resources among GSO and non-GSO satellite systems, enabling the sustainable development of the space ecosystem.

Study Group 4 Working Parties are continuing the preparatory work for WRC-23 under the agenda items for which they are the leading groups as well as for other agenda items for which they are contributing groups. Progress was also made on the development of the draft new Handbook on small satellites.

WPs 4A, 4B and 4C had established several Correspondence Groups between official meetings in order to progress their work. In 2021, the Correspondence Groups established under WP 4A met for over 94 hours.

Since RAG-21, five revised ITU-R Recommendations have been adopted and approved. SG 4 has also approved two new and one revised ITU-R Reports.

Recommendation ITU-R:

– M.1902-2 “Characteristics and protection criteria for receiving earth stations in the radionavigation-satellite service (space-to-Earth) operating in the band 1 215-1 300 MHz”

– M.1901-3 “Guidance on ITU-R Recommendations related to systems and networks in the radionavigation-satellite service operating in the frequency bands 1 164-1 215 MHz, 1 215‑1 300 MHz, 1 559-1 610 MHz, 5 000-5 010 MHz and 5 010-5 030 MHz”

– M.1787-4 “Description of systems and networks in the radionavigation-satellite service (space-to-Earth and space-to-space) and technical characteristics of transmitting space stations operating in the bands 1 164-1 215 MHz, 1 215-1 300 MHz and 1 559-1 610 MHz”

– S.2131-1 “Method for the determination of performance objectives for satellite hypothetical reference digital paths using adaptive coding and modulation”

– S.1714-1 “Static methodology for calculating epfd↓ to facilitate coordination of very large antennas under Nos. 9.7A and 9.7B of the Radio Regulations”

Report ITU-R:

– BO.2497-0 “Characteristics and effectiveness of frequency sharing criteria for the broadcasting-satellite service in Regions 1 and 3 subject to RR Appendix 30”

– M.2496-0 “Use of radionavigation-satellite service receiver characteristics in assessment of interference from pulsed sources in the 1 164-1 215 MHz, 1 215-1 300 MHz and 1 559‑1 610 MHz frequency bands”

– M.2220-1 “Calculation method to determine aggregate interference parameters of pulsed RF systems operating in and near the bands 1 164-1 215 MHz and 1 215 1 300 MHz that may impact radionavigation-satellite service airborne and ground-based receivers operating in those frequency bands”

The next meeting of WPs 4A, 4B and 4C is convened from 4 to 20 May 2022. SG 4 meeting is scheduled on 23 September 2022.

## 6.4 Study Group 5

SG 5 is continuing studies on systems and networks for the fixed, mobile, radiodetermination, amateur and amateur-satellite services, paving the way for the continuing development of all these services, including IMT, HAPS, ITS and PPDR.

In 2021, WP 5A appointed two Vice-Chairmen (Ms. Amy Sanders (USA) and Mr. Michael Krämer (Intel Corporation)). Likewise, WP 5B appointed Mr Jia Huang (CHN) and Mr Martin Weber (D) as Vice-Chairmen. SG 5 endorsed these appointments.

At its November 2021 meeting, WP 5C agreed to start work on studies called for under Resolution [ITU-R 59-2](https://www.itu.int/dms_pub/itu-r/opb/res/R-RES-R.59-2-2019-MSW-E.docx), on the availability of frequency bands for worldwide and/or regional harmonization and conditions for their use by Terrestrial Electronic News Gathering (ENG) and proposed a standardized format for the contribution of such information to the ITU. Administrative Circular [CACE/1008](https://www.itu.int/md/R00-CACE-CIR-1008/en) informs Member States about this work and the need to collect relevant information from the national administrations. An ITU-R webpage to consolidate web-links to administration lists of ENG information has been developed. The purpose of this database is to provide the necessary information to facilitate compliant ENG operations in a country (or area).

One new ITU-R Question; eleven revised ITU-R Recommendations and four new and two revised ITU-R Reports pertaining to the scope of SG 5 were approved. WP 5D updated the “Handbook on Global Trends in IMT” to include the IMT-2020 radio interfaces, now to become the “Handbook on IMT”. WP 5A has also approved a new edition of the Land Mobile Handbook (including Wireless Access). – Volume 4 on Intelligent Transport Systems. In addition, WP 5A decided to suppress the [Compendium of ITU’s work on Emergency Telecommunications](https://www.itu.int/net/ITU-R/terrestrial/res647/docs/Compendium.pdf). This decision was endorsed by SG 5.

Question ITU-R:

– 263/5 “Studies related to the further development of RSTT”

Recommendation ITU-R:

– F.2005-1 “Radio-frequency channel and block arrangements for fixed wireless systems operating in the 42 GHz (40.5 to 43.5 GHz) band”

– F.1777-3 “System characteristic of television outside broadcast, electronic news gathering and electronic field production in the fixed service for use in sharing studies”

– F.749-4 “Radio-frequency channel arrangements for systems of the fixed service operating in sub-bands in the 36-40.5 GHz band

– F.637-5 “Radio-frequency channel arrangements for fixed wireless systems operating in the 21.2‑23.6 GHz band”

– F.595-11 “Radio-frequency channel arrangements for fixed wireless systems operating in the 17.7-19.7 GHz frequency band”

– M.2150-1 “Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-2020 (IMT-2020)”

– M.2092-1 “Technical characteristics for a VHF data exchange system in the VHF maritime mobile band”

– M.2012-5 “Detailed specifications of the terrestrial radio interfaces of International Mobile Telecommunications-Advanced (IMT-Advanced)”

– M.1824-2 “System characteristics of television outside broadcast, electronic news gathering and electronic field production in the mobile service for use in sharing studies

– M.1796-3 “Characteristics of and protection criteria for radars operating in the radiodetermination service in the frequency band 8 500-10 680 MHz”

– M.1465-4 “Characteristics of and protection criteria for radars operating in the radiodetermination service in the frequency range 3 100-3 700 MHz”

Report ITU-R:

– M.2501-0 “Technical and operational characteristics of the foreign object debris detection system operating in the frequency range 92-100 GHz”

– M.2500-0 “Coexistence between high-speed railway radiocommunication system between train and trackside operating in the frequency bands 92-94 GHz, 94.1-100 GHz and 102‑109.5 GHz, and radio astronomy service and Earth exploration-satellite service (EESS) (active) and EESS (passive) services”

– M.2499-0 “Synchronization of IMT-2020 TDD networks”

– M.2498-0 “The outcome of ‘Way Forward Option 2’ for “ETSI (TC DECT) and DECT Forum Proponent” of the evaluation, consensus building and decision of the IMT-2020”

– M.2480-1 “National approaches of some countries on the implementation of terrestrial IMT systems in bands identified for IMT”

– M.2291-2 “The use of International Mobile Telecommunications (IMT) for broadband Public Protection and Disaster Relief (PPDR) applications”

Handbook ITU-R:

– Land Mobile (including Wireless Access) − Volume 4: Intelligent Transport Systems

– Handbook on International Mobile Telecommunications (IMT)

After having finalised and approved Recommendation ITU-R M.2150, containing the IMT-2020 Specifications in February 2021, a fourth radio interface standard has been included and Recommendation ITU-R M.2150-1 was published in February 2022. ITU-R WP 5D has also started the work on “IMT towards 2030 and beyond”, by requesting inputs from External Organisations about future technology trends as well as towards an according vision.

WPs 5A and 5C meetings are scheduled from 23 May to 3 June 2022 and WP 5B meeting is planned from 29 March to 8 April 2022. The 41st meeting of WP 5D will be held from 13 to 24 June 2022. In order to advance the work on WRC-23 agenda items 1.1, 1.2 and Radio Regulations (RR) No. **21.5**, an “interim meeting” of Working Group Spectrum Aspects and WRC-23 Preparations is scheduled from 19 to 22 April 2022. SG 5 meeting is planned on 28-29 November 2022.

## 6.5 Study Group 6

SG 6 is continuing studies on radiocommunication broadcasting, particularly on emerging topics including advanced technologies for terrestrial digital broadcasting, a global platform for the broadcasting service, high dynamic range television (HDR-TV), integrated broadcast-broadband (IBB) systems, new audio and video codecs for digital broadcasting, Advanced Immersive Audio‑Visual (AIAV) systems, renderer specifications for advanced sound systems, application of Artificial Intelligence for broadcasting, audio‑visual accessibility (AVA), and preparation for WRC‑23 agenda items or issues related to broadcasting services.

SG 6 has also been actively coordinating the work of mutual interest with ITU-T SGs 9 and 16 through Intersector Rapporteur Groups (IRGs) on Audio-Visual Accessibility (IRG‑AVA) and Integrated Broadcast-Broadband (IRG-IBB).

One revised ITU-R Question, one new and eight revised ITU-R Recommendations; and four new and nineteen revised Reports were approved. In addition, three ITU-R Recommendations were editorially updated.

Question ITU-R:

– 132-6/6 “Digital terrestrial broadcasting planning”

Recommendation ITU-R:

– BS.2143-0 “Transport method for non-Pulse-Code Modulation audio signals and data over digital audio interfaces for programme production and exchange”

– BS.1114-12 “Systems for terrestrial digital sound broadcasting to vehicular, portable and fixed receivers in the frequency range 30-3 000 MHz”

– BT.2077-3 “Real-time serial digital interfaces for UHDTV signals”

– BT.2075-4 “Integrated broadcast-broadband system”

– BT.2073-2 “Use of high efficiency video coding for UHDTV and HDTV broadcasting applications”

– BT.2036-4 “Characteristics of a reference receiving system for frequency planning of digital terrestrial television systems”

– BT.2033-2 “Planning criteria, including protection ratios, for second generation of digital terrestrial television broadcasting systems in the VHF/UHF bands”

– BT.1871-3 “User requirements for wireless microphones, in-Ear Monitoring devices and Wireless Multi-Channel Audio Systems”

– BT.1203-3 “User requirements for generic video bit-rate reduction coding of digital TV signals for an end-to-end television system”

Report ITU-R:

– BS.2494-0 “Sound test materials for advanced sound systems”

– BS.2493-0 “Practical implementation of broadcast systems using audio codecs for ITU advanced sound systems”

– BS.2384-2 “Implementation considerations for the introduction and transition to digital terrestrial sound and multimedia broadcasting”

– BT.2495-0 “Methods for laboratory and field measurements for the assessment of ATSC 3.0 reception quality”

– BT.2485-0 “Advanced network planning and transmission methods for enhancements of digital terrestrial television broadcasting”

– BT.2470-2 “Use of Monte Carlo simulation to model interference into DTTB”

– BT.2469-2 “Typical frequency sharing characteristics for digital terrestrial broadcasting systems in the frequency band 174-230 MHz”

– BT.2468-1 “Guidance for selection of system parameters and implementation of second generation DTTB systems”

– BT.2467-1 “Methods for the evaluation of the quality of service of second generation DTTB systems”

– BT.2447-2 “Artificial intelligence systems for programme production and exchange”

– BT.2446-1 “Methods for conversion of high dynamic range content to standard dynamic range content and vice-versa”

– BT.2420-3 “Collection of usage scenarios of advanced immersive sensory media systems”

– BT.2408-4 “Guidance for operational practices in HDR television production”

– BT.2400-4 “Usage scenarios, requirements and technical elements of a global platform for the broadcasting service”

– BT.2390-10 “High dynamic range television for production and international programme exchange”

– BT.2383-3 “Typical frequency sharing characteristics for digital terrestrial television broadcasting systems in the frequency band 470-862 MHz”

– BT.2343-7 “Collection of field trials of UHDTV over DTT networks”

– BT.2302-1 “Spectrum requirements for terrestrial television broadcasting in the UHF frequency band in Region 1 and the Islamic Republic of Iran”

– BT.2301-3 “National field reports on the introduction of IMT in the bands with co-primary allocation to the broadcasting and the mobile services”

– BT.2267-11 “Integrated broadcast-broadband systems”

– BT.2254-5 “Frequency and network planning aspects of DVB-T2”

– BT.2245-9 “HDTV and UHDTV including HDR-TV test materials for assessment of picture quality”

– BT.2140-13 “Transition from analogue to digital terrestrial broadcasting”

Handbook ITU-R:

– Handbook on Digital Terrestrial Television Broadcasting networks and systems implementation

SG 6 and its WPs meetings are scheduled from 7 to 18 March 2022. TG 6/1 met from 21 February to 4 March 2022.

**6.6 Study Group 7**

SG 7 is continuing to develop ITU-R Recommendations, Reports and Handbooks that are used for development and for ensuring non-interference into the operation of space operation, space research, Earth-exploration and meteorological systems (including the related use of links in the inter-satellite service), radio astronomy and radar astronomy; and for the dissemination, reception and coordination of standard-frequency and time-signal services (including the application of satellite techniques) on a worldwide basis.

The systems addressed by SG 7 are used in activities that are a critical part of our everyday life such as:

– global environment monitoring – atmosphere (including greenhouse gases emissions), oceans, land surface, biomass, *etc*.;

– weather forecasting and climate change monitoring and prediction;

– detection and tracking of many natural and man-made disasters (earthquakes, tsunamis, hurricanes, forest fires, oil leaks, etc);

– providing alerting/warning information;

– damage assessment and planning relief operations.

Mr Joseph Achkar (F) was appointed as Chairman of WP 7A after the sudden death of the previous WP 7A Chairman, Mr Ronald Beard (USA). Moreover, four Vice-Chairmen (Mr. Ted Berman (USA), Mr. Keving Knights (AUS), Mr. Anton Stepanov (RUS) and Mr. Philippe Tristant (F)) were appointed for WP 7B. WP 7C appointed Mr. Tarcisio Aurélio Bakaus (B) as Vice-Chairman.

Two new and three revised ITU-R Recommendations, two new ITU-R Questions, and six new and two revised Reports were approved.

Questions ITU-R:

– 258/7 “Geodetic VLBI 258-7”

– 259/7 “Timing applications and the definition of the second”

Recommendation ITU-R:

– RA.1031-3 “Protection of the radio astronomy service in frequency bands shared with active services”

– RS.2105-1 “Typical technical and operational characteristics of Earth exploration-satellite service (active) systems using allocations between 432 MHz and 238 GHz”

– RS.1861-1 “Typical technical and operational characteristics of Earth exploration-satellite service (passive) systems using allocations between 1.4 and 275 GHz”

– SA.2142-0 “Methodologies for calculating coordination areas around Earth exploration‑satellite and space research earth stations to avoid harmful interference from IMT-2020 systems in the frequency bands 25.5-27 GHz and 37-38 GHz”

– SA.2141-0 “Characteristics of SRS Systems in the frequency range 14.8-15.35 GHz”

Report ITU-R:

– RA 2259-1 “Characteristics of radio quiet zones”

– RS.2492-0 “Global survey of radio frequency interference observed by SMOS radiometer in the EESS (passive) band 1 400-1 427 MHz”

– RS.2491-0 “Global survey of radio frequency interference observed by the SMAP radar in the 1 215-1 300 MHz band and the SMAP radiometer in the 1 400-1 427 MHz band”

– RS.2490-0 “Global survey of radio frequency interference observed by the Aquarius scatterometer in the 1 215-1 300 MHz band and the Aquarius radiometer in the 1 400-1 427 MHz band”

– RS.2489-0 “Technical and operational characteristics of ground-based passive sensors operating in the 51-58 GHz frequency range”

– RS.2068-2 “Current and future use of the band 13.25-13.75 GHz by spaceborne active sensors”

– SA.2488-0 “Characteristics to be used for assessing interference to systems operating in the Earth exploration-satellite and meteorological-satellite services, and for conducting sharing studies”

– TF.2487-0 “Protection criteria for systems in the standard frequency and time signal services”

WPs 7A, 7B, 7C and 7D will meet from 25 April-6 May 2022. The next meeting of Study Group 7 is tentatively scheduled for 26 September 2022 and 7 October 2022 in Geneva, Switzerland.

## 6.7 Coordination Committee for Vocabulary

The Coordination Committee for Vocabulary (CCV) is continuing to assist in ensuring the consistency among the various ITU-R terms and definitions, filter all the proposals coming from the Radiocommunication Study Groups and validate the terms and definitions before introducing them into the ITU terminology database.

After the adoption of Council Resolution 1386, “ITU Coordination Committee for Terminology (ITU CCT)”, the ITU CCT meetings are conducted with extensive use of electronic methods. Work is on‑going on improvements to the ITU terminology database.

## 6.8 CPM23-2 and WRC-23 Preparations

See Section 5 of Doc. [RAG/44](https://www.itu.int/md/R20-RAG-C-0044/en).

# 7 Liaison and collaboration with ITU-D and ITU-T, and with other organizations

Intersectoral activities have continued throughout the period, particularly concerning ITU’s priority topics of climate change, emergency communications and accessibility.

*•* *ITU-D*

BR continues to contribute to the BDT workshops and seminars. These events provide an opportunity to present ITU‑R’s standardization activities and, in turn, to demonstrate their contribution to Resolution 123 (Rev. Dubai, 2018) in bridging the standardization gap.

BR actively participated in the meetings of the ITU-D SGs to provide the latest development in the activities of the ITU-R SGs, as well as guidance on ITU-R Recommendations, Reports and Handbooks of particular interest to developing countries. The ITU‑D SGs were invited to consider the ITU-R information provided in order to avoid duplication of effort, and to make use of the results of work done by the ITU-R SGs.

*•* *ITU-T*

In addition to climate change and emergency communications, topics of mutual interest between ITU‑R and ITU-T include IMT-2020, the effects of human exposure to radio frequencies, power line transmission systems, smart grid, smart cities, EMC/EMI, intelligent transport systems, audio-visual media accessibility, common patent policy and intellectual property rights.

There continues to be a requirement for close coordination on the various topics being addressed by ITU-T that have implications for radiocommunication systems to reduce the potential for overlap, duplication and conflict of work undertaken by the two Sectors.

*• Other organizations*

Healthy liaison has continued between ITU-R SGs and other organizations, with due reference to Resolution [ITU-R 9](https://www.itu.int/pub/R-RES-R.9), where required.

The Bureau continued to maintain close cooperation with international and regional organizations with the following objectives:

1. promote dialogue amongst bodies having common interests;
2. improve coordination leading to more effective preparation for events such as WRCs; and
3. keep ITU-R abreast of relevant activities in other organizations for a more strategic planning of work programmes.

The Bureau continues its close cooperation with the relevant international and regional organizations dealing with the use of spectrum, including the Regional Telecommunication Organizations recognized by the ITU for regional coordination (APT, ASMG, ATU, CEPT, CITEL and RCC); broadcasting organizations (ABU, ASBU, EBU and HFCC); and those focused on the use of specific radiocommunication systems and services (e.g., ITSO, ESOA, GVF, GSMA) by organizing, promoting and participating in events to build capacity on the use of the Radio Regulations, including World Radiocommunication Seminars and Regional Radiocommunication Seminars.

The Bureau continues to participate in the activities of the Global Standards Collaboration (GSC). Involvement with the 3GPP and IEEE has been maintained, as well as several regional standardization organizations, given their importance and relevance to the work of SG 5. Other notable areas of liaison with Study Groups activities include those with the World Meteorological Organization, the World Health Organization, ISO and IEC (including CISPR), Space Frequency Coordination Group and several others on an ad-hoc basis.

The Bureau ensured liaison and cooperation with the UN Committee on the Peaceful Uses of Outer Space (UN-COPUOS), the International Maritime Organization (IMO), the International Mobile Satellite Organization (IMSO), Bureau International des Poids et Mesures (BIPM), the International Telecommunications Satellite Organization (ITSO), COSPAS-SARSAT, the International Committee of the Red Cross (CICR), the International Civil Aviation Organization (ICAO) with regard to the application of ITU treaty texts. BR experts also participated in various meetings of these organizations.

The International Union of Radio Science (URSI) held its 34th General Assembly and Scientific Symposium in September 2021 and approved two resolutions of ITU-R interest: the first describes the view of radio scientists in the community of URSI regarding the need for a continuous-reference time scale, responding to Resolution **655 (WRC-15)**; the second resolution, proposes to strengthen the relationship between URSI and ITU.

This second resolution aims to work closely with ITU setting up a URSI-ITU Inter-commission Working Group to: identify those areas that may influence the evolution of telecommunications in the long term; keep the URSI community informed on specific questions posed by ITU study groups and WRC agenda items and particularly those falling under the purview of expertise within the URSI Commissions; stimulate and coordinate studies, collaborations, and symposia that will address these ITU questions and prepare URSI statements on such topics in an appropriate form; establish task groups or other mechanisms as appropriate to undertake the above tasks.

# 8 Other intersectoral activities

BR has actively participated in other intersectoral activities that are relevant to the work of ITU‑R SGs, as described below:

*–* Climate Change and Emergency Communications: The BR participates in the Intersectoral activities coordinated by the ITU Climate Change and Emergency Telecommunications Task Force for the implementation of Resolution 136 (Rev. Dubai, 2018). There are also studies in response to Resolution [ITU‑R 60-2](https://www.itu.int/pub/R-RES-R.60) (Reduction of energy consumption for environmental protection and mitigating climate change by use of ICT/radiocommunication technologies and systems).

– Accessibility: ITU-R has been actively participating in the ITU-T JCA-AHF (Joint Coordination Activity on Accessibility and Human Factors).

– Spectrum/EMC: When addressing spectrum related/EMC issues, close coordination with the relevant ITU-R groups is ensured before liaising with external organizations on those issues, particularly where well-established and efficient collaboration between ITU-R and those organizations already exists.

– WSIS and CWG on WSIS&SDG: In response to Resolution 140 (Rev. Dubai 2018) of the Plenipotentiary Conference on “ITU's role in implementing the outcomes of the World Summit on the Information Society and the 2030 Agenda for Sustainable Development, as well as in their follow-up and review processes”, ITU-R maintains a healthy liaison with the CWG on WSIS&SDG and contributes with the updates on the work carried out by the ITU‑R Study Groups in response to WSIS action lines and in the achievement of the Sustainable Development Goals (SDGs). BR SGD has prepared and published a website that lists the ITU-R publications related to each SDG. This can be found here: <https://www.itu.int/en/ITU-R/study-groups/Pages/Sustainable-dev-goals.aspx>.

Moreover, the BR Director and the Deputy Director will continue to participate in the high-level policy sessions as well as in the WSIS TalkX sessions organised during the WSIS Forum.

– ITU-R actively participated in the organisation of ITU Workshop on “The Future of Television for Europe” and ITU Workshop on “The Future of Television for Asia-Pacific”.

– Preparation for and participation at ITU meetings: BR is continuing its participation in the activities related to the major ITU events, conferences and meetings and their preparation in relation to the work of the ITU-R SGs. These activities are in support of the Plenipotentiary Conference, the ITU Council, WTSA, WTDC, WSIS and ITU TELECOM World.

## 9 Follow-up actions requested by RAG at its meeting in 2021

In response to RAG’s requests at its 2021 meeting as contained in the Summary of Conclusions (Administrative Circular [CA/256](https://www.itu.int/md/R00-CA-CIR-0256/en)), BR SGD has implemented the following actions:

## 9.1 ITU-R Study Groups’ and Working Parties’ recent accomplishments of interest for ITU-D Study Groups

During its last meeting in April 2021, the RAG supported the request to encourage the ITU-R SGs and WPs Chairmen, using existing mechanisms, to provide summaries of their SG’s or WPs’ recent accomplishments to the relevant ITU-D SGs. In response to this request, BR SGD keeps up to date all the recently approved outputs by its SGs and WPs. This information is published on a regular basis on the [ITU-R SGs website](https://www.itu.int/dms_pub/itu-r/oth/0a/0e/R0A0E0000E80001PDFE.pdf). The file contains a list of recently approved texts in a chronological order for the 2019-2023 study period as well as a brief description of the content of each document. BR SGD has mapped the ITU-D and/or ITU-T Study Group and study question for which each ITU-R document could be relevant.

## 9.2 Enhancement of guidelines to improve e-meetings

Following RAG’s advice, BR SGD has worked hard to try to improve how e-meetings are conducted. For this, information (INFO) documents with detailed guidelines on how to connect to the platform have been developed and published well in advance of each WP or SG meeting. Reminders on the application of the General Rules of Conferences, Assemblies and Meetings of the Union are included in these INFO documents to ensure a smooth development of the meeting. Equally, test sessions have been arranged with delegates and separate training on the use of the platforms have been organized for Chairmen. Assistance before and during the meeting has been provided to delegates experiencing issues of technical nature to connect remotely to the meetings.

The BR continues exploring ways on how to improve e-meetings in collaboration with the IS Department as well as with ITU-R Registrations team.

## 9.3 Gender equality, equity and parity in leadership positions within ITU-R Study Groups and Working Parties

Following the invitation from RAG and in line with the WRC-19 Gender Declaration, WP 1B appointed Ms. Tatiana Sukhodolskaia as Vice‑Chairman of this Group. It is also highlighted that, in several WPs and in TG 6/1, an increase on the number of women chairing Working Groups (WGs), Sub-Working Groups (SWGs) and Drafting Groups (DGs) activities has been experienced. Nevertheless, it is noted that due to the highly technical nature of the topics studied under some WPs, the community is already very reduced and sometimes achieving parity is not evident.

## 9.4 Update and harmonization of ITU-R Study Groups and Working Parties websites

The websites of ITU-R SGs and WPs are updated on a regular basis to show the latest information for membership. BR SGD has tried, to the extent possible, to harmonize the presentation of the websites of the ITU-R Study Groups, Working Parties, CCV, CVC and CPM.

## 9.5 First session of RAG meeting held on 24th February 2022

At its meeting held on 24 February 2022, the Radiocommunication Advisory Group (RAG) reviewed Draft ITU-R Strategic and Financial Plans and also, among other subjects, the planned measures for returning to physical ITU-R meetings with remote participation were presented.

During the discussion, some comments and suggestions to the SGs/WPs Chairmen when preparing physical meetings with remote participation were expressed by the participants and are summarized below.

Requests to SGs/WPs Chairmen:

− Take into consideration participants’ time zone when arranging sessions. It was suggested to use and display, if feasible, the world clocks showing the time difference around the world (<https://www.inside.net/ITUclocks/>).

− Limit the time of interventions in order to optimize the time of the meeting and to progress the work.

− Observe the time schedule and try to maintain the agreed working hours to schedule meetings. Try to avoid, to the extent possible, using Periods 0, 5 and 6, i.e., setting up meetings before 09:00 and after 17:00 hours CET.

− Avoid having too many meeting sessions in parallel.

− Discourage holding meetings during the weekends.

− Limit the creation of too many Correspondence Groups (CGs).

### 9.6 Eighteenth meeting of Chairmen and Vice-Chairmen of Radiocommunication Study Groups (CVC-18)

The 18th meeting of the Chairmen and Vice-Chairmen of ITU-R SGs was convened by the BR Director and held electronically on 24 January 2022. The invitation to this meeting was also extended to the Chairmen and Vice-‑Chairmen of the CPM and the RAG, as well as to the CPM Chapter (co‑)Rapporteurs.

The main topics discussed during this session were related to the 2022 meetings calendar, the impact of the construction of the new ITU building on the availability of meeting rooms, the current working arrangements during e-meetings and the possibility to resume physical meetings with remote participation. Participants also shared the status of studies of each Group and their needs for the upcoming meetings to complete the studies and to prepare the draft CPM texts in time for CPM23-2.

The summary of the 18th meeting of the CVC can be found in Doc. [CVC/5](https://www.itu.int/md/R19-CVC-C-0005/en).

## 9.7 Information about attendance

RAG-21 was attended by almost all the SGs, WPs and TG Chairmen and by 35% of the Vice‑Chairmen.

Chairmen and Vice-Chairmen have attended largely the meetings of their relevant Groups (SGs, WPs and TG 6/1).

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