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|  | **Revision 1 to****Document RAG/44-E** |
| **22 March 2022** |
| **Original: English** |
| Director, Radiocommunication Bureau |
| report TO the twenty-NINTH meeting of the radiocommunication advisory group |

#

# 1 Introduction

This document provides status reports and information on some of the issues that appear on the draft agenda for the 29th meeting of RAG (see [CA/259](https://www.itu.int/md/R00-CA-CIR-0259/en) of 17 December 2021). This document is intended to assist the meeting in considering the relevant agenda items.

Separate reports will be submitted for some of the agenda items.

# 2 Council issues

Due to the COVID-19 restrictions, the ITU Council did not hold physical meetings in 2021. Instead, there was one Virtual Consultation of Councillors (VCCs) that was held on 8-18 June 2021 followed by a consultation by correspondence on outcomes of the VCC discussions. This procedure allowed the ITU Council to take decisions without meeting physically.

This section covers ITU Council matters, and includes updates to the issues addressed by the VCC, its subsequent consultations by correspondence on the outcomes of those discussions and related action (see: <https://www.itu.int/en/council/2021/Pages/default.aspx>). Discussion of the Council’s consideration of the place and date of the 2023 World Radiocommunication Conference (WRC-23) is included in section 5 of this Report.

## 2.1 Free on-line access to ITU-R Publications

ITU continues to publish flagship and various other publications in both print and digital/electronic versions. By Decision 12 (Guadalajara, 2010), PP-10 adopted a free online access policy to include, inter alia, ITU R Recommendations and Reports. This policy was expanded by Council 2012 Decision 571, revised by Council 2013 and 2014, and confirmed by PP-14 revised Decision 12, which provides free online access for the general public, on a permanent basis. Many publications were added to the free online access to disseminate information and reach out to a wider general public. These include major publications such as the Radio Regulations, Rules of Procedure, Recommendations, Basic Texts of the Union, WCIT Final Acts, Council Resolutions and Decisions, and ITU Handbooks, resulting in only Maritime Service Publications and a few other titles still for sale.

Furthermore, in response to requests from Member States, in particular developing countries, in January 2017 the free access policy has been extended by the BR Director to include all ITU-R Handbooks.

The impact of these Decisions is well reflected by the large number of downloads of these publications, as indicated in Section 8.1.4.

## 2.2 Cost recovery for satellite network filings

In 2021, the usual annual report on the implementation of Decision 482 was submitted to the Council (see [Document C21/16](https://www.itu.int/md/S21-CL-C-0016/en)). Since the implementation of Decision 482 (Modified 2020) by the Radiocommunication Bureau did not give rise to any substantive administrative or operational difficulty, either internally or with administrations notifying satellite network filings, the Council was invited to take note of this report.

Following the consultation by correspondence on the outcomes of discussions of the 2021 Virtual consultation of Councillors, reports on the implementation of Decision 482 to Council sessions of 2020 and 2021 were formally noted (see Circular Letter [DM-21/1017](https://www.itu.int/md/S21-DM-CIR-01017/en)).

The annual report on the implementation of Decision 482 for the 2022 session of the Council is available as [Document C22/16](https://www.itu.int/md/S22-CL-C-0016/en).

## 2.3 Budget for 2020-2021 and draft budget for 2022-2023 periods

The virtual consultation in 2021 adopted through Resolution 1405 the following budget for the ITU‑R in the 2022-2022 timeframe.

The biennial Budget of the Union for 2022-2023 was presented by the secretariat based on Decision 5 (Rev. Dubai, 2018) and associated guidelines during the Virtual consultation in June 2021.



The amount of the contributory unit to be paid by Member States of CHF 318,000 has been maintained resulting in zero nominal growth since 2016. Expenses and revenue are balanced without any withdrawal from the Reserve Account.

As in previous budgets, a five per cent vacancy rate has been applied which implies recruitment delays, part-time service and leave without pay. Nevertheless, the implementation of the vacancy rate will pose a significant challenge in the management of vacant positions and the recruitment process. The budget for 2022-2023 was based on the programme of activities of the Union, which includes the holding of the 2023 World Radiocommunication Conference (WRC-23).

The secretariat indicated that there will be no significant savings if any, to be expected from this period. In the event there are funds available, they would be prioritized to meet Decision 619 requirements for 2022, which amount to 785 K CHF. The final result of the 2021 budget implementation will be presented to the special Council session in Bucharest together with the External audit report of the financial statements.

## 2.4 Request of Council Working Group on Languages (CWG-LANG) for RAG review and update of document C14/INF/4

In 2008, with the view of implementing the use of the six official languages on an equal footing within the available budget, as required by Resolution 154 of the Plenipotentiary Conference, the Advisory groups of the Sectors and the General Secretariat identified in detail the documents and publications which would be produced in the different languages, as set out in the tables in Annex 1 of Document [C08/56](https://www.itu.int/md/S08-CL-C-0056/en), which were submitted to the Council for endorsement.

In 2014, a detailed review of these tables was conducted and resulted in the publication of Document [C14/INF/4](https://www.itu.int/md/S14-CL-INF-0004/en), which has guided the work of the Secretariat as refers to translation and interpretation at ITU.

In its 10th meeting (October 2020), the Group on Study and Evaluation of the Translation Procedures, where all sectors and the General Secretariat are represented, agreed on the need for a review of the measures and principles for interpretation and translation (Document [C14/INF/4](https://www.itu.int/md/S14-CL-INF-0004/en)), in order to:

1. update the publications section of [C14/INF/4](https://www.itu.int/md/S14-CL-INF-0004/en), as some of the publications had either been discontinued or replaced by others;
2. implement a common language policy for ITU Web as soon as it is available;
3. consider the possibilities made available by machine translation and remote interpreting;
4. seek some sort of correlation in translation and interpretation services, where relevant.

To this end, the Group approved an action plan with a view to submitting revised measures and principles for interpretation and translation to the 2022 meeting of the CWG-LANG. This action plan was described in §5 of [CWG-LANG/11/2](https://www.itu.int/md/S21-RCLCWGLANG11-C-0002/en), the Secretary General’s Report to the 11th meeting of CWG-LANG that was held on 5 February 2020.

According to such an action plan, the Bureaux and the General Secretariat were requested to prepare a draft proposal for submission to the relevant Advisory Group. The proposals so approved would be compiled in an Annex to the SG Report to CWG-LANG (2022 meeting), for endorsement and submission to Council-22.

# 3 Implementation of WRC-19 decisions

### 3.1 Software development to implement WRC-19 decisions

The BR is finalizing software design and development to implement WRC-19 decisions.

The following presents a summary of the main tasks finalized since the last report or remaining to be finalized.

### 3.1.1 Implementation of WRC-19 decisions relating to terrestrial services:

* Development of the software modules for processing HAPS notifications (validation, examination, and publication tools). This task also comprises the development of calculation modules for checking technical conditions specified Resolutions **122 (Rev.WRC-19)**, **145** **(Rev.WRC-19)**, **165 (WRC-19)**, **166 (WRC-19)**, **167 (WRC-19)**, and **168 (WRC-19)**, as well as the corresponding changes in the database and filing structure.
* Development of the examination software for identification of affected administrations using digital elevation models (DEM) for several frequency bands and services.

### 3.1.2 Implementation of WRC-19 decisions relating to space services:

* Due to the fact that certain changes adopted by WRC-19 entered into force immediately, an intermediate release of space services software (version 9) was released on IFIC 2926 (4 August 2020). The full set of changes related to WRC-19 shall be available in the last quarter of 2022 as version 9.1 of BR Space Software. The main difference with respect to the V9 database version will be the indication of mutually exclusive constellations.
* A partial list of changes to space service software related to WRC-19 implementation in 2021 includes:
* The first phase of the implementation of Resolution **35 (WRC-19)** was released in production in January 2021 as part of the regular updates to the e-Submission web application (as described in section 7.3.2);
* Development of a tool to assist administrations in communicating to the Bureau the coordination status with respect to affected administrations at first notification and resubmission of notification (in SpaceCap, BR-SIS, e-Submission, SpacePub, and in BR internal processing) (as described in section 7.3.3);

### 3.2 Other actions to implement WRC-19 decisions

The Bureau reviewed the findings of the frequency assignments recorded in the Master Register in the frequency bands for which the allocation situation was changed as a result of the WRC-19 decisions entered into force on 1 January 2021.

# 4 Study Groups activities

This topic is presented in Addendum 1 to this document.

# 5 WRC-23 agenda, dates and venue, and related preparations

Further to the approval on 3 August 2020 by the ITU Member States of the WRC-23 Agenda, as now contained in [Council Resolution 1399 (C-20)](https://www.itu.int/md/S20-CL-C-0069/en), the Virtual Consultation of Councillors (VCC) of the Council held on 8-18 June 2021 was invited to adopt a new Decision containing the dates and possible two venues in the UAE for RA-23 and WRC‑23. The Council [adopted Decision 623 (C-21)](https://www.itu.int/md/S21-CL-C-0096/en), indicating that WRC-23 will take place either in Abu Dhabi or Dubai, UAE from 20 November to 15 December 2023, preceded by RA-23 from 13-17 November 2023. This Decision was subsequently approved by correspondence as indicated in ITU SG Circular Letters [DM21/1017](https://www.itu.int/md/S21-DM-CIR-01017/en) of 4 August 2021 and [CL-21/049](https://www.itu.int/md/S21-SG-CIR-0049/en) of 19 October 2021).

Despite the decision on the dates of WRC-23, it was not possible to change the preliminary booking of the CICG from 27 March to 6 April 2022 in order to postpone the Second Session of the Conference Preparatory Meeting for WRC-23 (CPM23-2) to later dates taking into account §A1.2.3 of Resolution ITU-R 2-8. However, investigations have been carried out to encourage a host country to provide an alternative venue for CPM23-2 to be held during the first half of May 2023. Outcomes of these investigations were not available at the time of the preparation of this document.

Based on the results of the first session of CPM-23 and taking into account the deadlines established for the preparation of the draft CPM Report to WRC-23 (see [BR Administrative Circular CA/251](http://www.itu.int/md/R00-CA-CIR-0251/en) of 28 January 2020 and its Addendum 1 of 17 September 2020, with the related corrigenda), significant progress has been made during the reporting period by the ITU-R working parties and task group responsible for the preparatory studies on WRC-23 agenda items and topics. Detailed information regarding the ITU‑R preparatory studies for WRC-23 can be found on the following updated ITU webpage: [www.itu.int/go/rcpm-wrc-23-studies](http://www.itu.int/go/rcpm-wrc-23-studies). The completion of these activities in accordance with the pre-established work plans should ensure in particular the availability in due time of the draft CPM Report to WRC-23 for its consideration during the second session of CPM‑23.

Taking into account PP Resolution 80 (Rev. Marrakesh, 2002) and Resolution **72 (Rev.WRC-19)**, extensive preparations for WRC‑23 continued also at the regional level, with the BR’s active participation in the meetings of the regional groups and Regional Telecommunication Organizations (RTOs), including APT, ASMG, ATU, CEPT, CITEL and RCC, wherever possible.

Information on the regional groups’ preparation for WRC-23 can be found at: [www.itu.int/go/wrc-23-regional](http://www.itu.int/go/wrc-23-regional).

To start building consensus on the positions and proposals developed by the RTOs, the BR convened the [1st ITU Inter-regional Workshop on WRC-23 Preparation](http://www.itu.int/go/ITU-R/wrc-23-irwsp-21) as an online event held from 13 to 15 December 2021. The workshop was attended by 692 participants representing 82 countries and 78 companies, organizations and academia, including representatives from the above-mentioned RTOs (see details on the participation in the [Workshop Document 28](https://www.itu.int/md/R19-WSHWRC23-C-0028/en)). The information provided during the Workshop and the exchanges of views between stakeholders during panel discussions were very much appreciated. [Webcast archives](https://www.itu.int/en/ITU-R/information/events/webcast/Pages/default.aspx) of the discussions in the six official languages of the Union and the [Workshop documents](https://www.itu.int/md/R19-WSHWRC23-C/en) are still available online. The availability of the preliminary version of the Conference Proposal Interface (CPI) for WRC-23 ([www.itu.int/net4/Proposals/CPI/WRC23](http://www.itu.int/net4/Proposals/CPI/WRC23)) was also briefly mentioned during the Workshop. Two other ITU Inter-regional Workshops on WRC-23 Preparation are planned: one prior to CPM23-2 and a final one prior to WRC-23.

The ITU website for WRC-23 at: [www.itu.int/wrc-23](http://www.itu.int/wrc-23) has been developed to provide direct access to the above-mentioned information as well as to many others. For instance, it includes a link to the new WRC-23 Booklet ([www.itu.int/wrc-23/booklet-wrc-23](http://www.itu.int/wrc-23/booklet-wrc-23)). This website will be updated regularly prior to the WRC-23.

# 6 Operational planning

The ITU-R Operational Plan has been structured in accordance with the results-based management concept of the Union to ensure complete linkage with the budget and other financial tools of the Union.

The draft ITU‑R Operational Plan for the period 2022-2025 is presented in Document 27, for review and comments by RAG.

# 7 BR information system

## 7.1 Terrestrial software and tools

### 7.1.1 Processing of coordination requests under RR No. 9.21

The development of the software modules and associated tools for the processing of coordination requests under RR No. **9.21** continued during 2021. The algorithms and software modules used for technical examinations under No. **9.21** have been reviewed in accordance with the corresponding RoPs: existing algorithms were revised, and new algorithms were introduced, in particular regarding RoP B6. The testing of these algorithms is undergoing. The completion of the software for checking the corresponding assignments (subject to **9.21**) notified under RR Article **11** to the Master Register and its integration into TerRaSys is scheduled for the fourth quarter of 2022 in the context of the overall system migration.

### 7.1.2 Migration from Ingres to SQL Server

The work on the migration of the TerRaSys database from Ingres to SQL Server continued during 2021, including:

* The final design of the needed new database structures to accommodate the processing of HAPS, following WRC-19 decisions. Review and stabilization of the database structures, schemas, and procedures (including archiving) to adapt them and take advantage of the modern technology offered by the new DBMS;
* Review and redesign of the used data types and the introduction of new geographic data types provided by the new DBMS, which offer efficient techniques for performing fast complex geographic queries;
* Continued redesign of various TerRaSys software components and applications used to access the database, with the view of taking advantage of the modern technology offered by the new DBMS and using web applications and modern software development technologies.

The new database system and software modules for the processing and front-end validation of the electronic terrestrial notifications were finalized and are currently under Beta testing. Work on the migration of the software modules for examination is finalized. The work on displaying examination results started and the delivery for Beta testing is expected at the beginning of May 2022. Work on the publication and preparation of the new BR IFIC packages is being finalized and tested before delivery for Beta testing. Delivery is expected during May 2022.

Various Web Applications are being designed and implemented to allow online access to the database queries and other software tools, including the online validation and examinations of the terrestrial notifications of frequency assignments.

It is expected that the full migration and restructuring of the existing system will be completed by the end of November 2022. A circular letter describing the resulting new and modified Terrestrial database structure and tools on the BR IFIC is under preparation and will be sent to the Administrations and other users.

Copies of the existing terrestrial database on the new DBMS platform are now available and are being used by various BR applications through the web to display, validate and process terrestrial frequency notifications.

## 7.2 Progress in fulfilling the BR Space Information Systems roadmap (RAG-19, 2012)

RAG-19 (2012) advised the Director to implement recommended actions within the proposed timeframe, as described in the agreed roadmap, comprising: Phase 1 (Implementation of WRC-12 decisions); Phase 2 (Rewrite some existing software); and Phase 3 (Set up a project team to implement a common framework, security system, and centralized space database). RAG encouraged Member States and Sector Members to submit their comments on Phase 3.

In 2021, the BR continued to maintain existing legacy software, while at the same time working on implementing new versions of key software applications. This parallel effort is both a necessity due to operational exigencies as well as the reason why certain modernization projects are still underway.

### 7.2.1 Progress toward achieving the objectives of Phase 2 of the roadmap

#### 7.2.1.1 Rewrite legacy software for technical examination

* Rewrite PFD for protection of space services: Ongoing.
* Migrate technical examination software written in Fortran from Compaq Visual Fortran compiler to Intel Fortran compiler: Completed.
* Migration of GIMS Fortran components: Not yet started.
* Mspace – Migration of Visual Basic 6 components to .NET: Ongoing.

#### 7.2.1.2 Design and develop the BR Space Information System (BR SIS)

* Rewrite SpaceCap written in Visual Basic 6: Ongoing. In Q1 2022, the first modules of SpaceCap implemented in BRSIS will be made available, as part of the coordination agreements capture feature.
* Migrate SRS MDB to a more modern technology: Although the choice of technology to replace MDB files is clear, the migration will significantly impact BR internal space services processing. Therefore, the migration to SQLite databases cannot be delivered in production before WRC-23. Even when the BR Space Software applications move to SQLite, backward compatibility with the MDB format, as well as conversion tools, will be retained for the foreseeable future.
* Migrate SNS database on Ingres to SQL Server: The migration of Ingres-environment-specific internal processing applications continued in 2021. The remaining internal processing applications must be rewritten or adapted in 2022, to be in production in the last quarter of 2022 at the latest.
* Review SNTrack: Ongoing. In 2021, the cost recovery module in SNTrack was migrated to a modern .NET WPF application running on SQL Server. Other parts of SNTrack will be gradually replaced by a Space Management Information System to complete the back-office functionality of the e-Submissions system.
* Review SNS Online (and merge with SNL Online): Ongoing. Development of the web application "ITU Space Explorer" to replace the data mining system previously contained in the SNS Online and SNL Online is part of the project to implement Resolution 908 and to satisfy instruction 4 of Resolution 186 (Rev. PP-18 Dubai). Phase 1 of the project has progressed in 2021 and should be available to external testers in Q1 2022. The first release in production is expected for June 2022.

### 7.2.2 Progress toward achieving the objectives of Phase 3 of the roadmap

The work done during the previous phases, as well as the design and technology choices made thereafter, provide a foundation for successful completion of Phase 3, which will be as follows:

* A schema redesign, preserving equivalence of data, but with the objective to eliminate certain redundancies, will be delivered at the same time as the implementation of WRC-23 decisions, so as not to force a database schema change too frequently.
* Activities on centralizing and streamlining risk, recovery, and security management: Ongoing.

## 7.3 Software developments related to space services

### 7.3.1 Implementation of Resolution 907 (Rev.WRC-15): Use of modern electronic means of communication for satellite network-related administrative correspondence

In 2021, work continued on implementing and maintaining the “e-Communications” online system in response to Resolution **907 (Rev.WRC-15)**.

New filtering functions (Handled/Unhandled, Read/Unread) were implemented for the Inbox and Sent box. Major improvements in the management of correspondence within the BR internal system have been carried out to enhance security and reliability. A new user role, “an administration acting on behalf of an intergovernmental satellite organization” is being developed and is expected to be made available in Q1 2022.

There are 144 Administrations registered in the e-Communications system, out of which 112 Administrations have sent correspondence via the system, as of March 1st 2022.

### 7.3.2 Implementation of Resolution 908 (Rev.WRC-15): Electronic submission of satellite network filings

The “e-Submission” system has been providing round-the-clock operation to administrations and operators for the submission of satellite network filings throughout 2021. The number of registered Administrations has grown to 150 as of March 1st 2022.

In 2021, a new type of notice, deployment information submitted under Resolution **35 (WRC‑19)**, was implemented on the e-Submission system. More information is provided in section 7.3.4. This is the first notice type that can be captured using the online interface in the e-Submission system.

In addition, various performance and usability enhancements were implemented for the system.

Further development is expected for the e-Submission system in 2022, including an extension of the system for internal BR processing of notices, the creation of a new status of “Published in BR IFIC” for notices, an online tool for submission of regulatory comments, and the provision of technical examination tools online for administrations to verify their filings before submission.

To assist in the development and testing, the Administration of Japan has made a financial contribution and has also made available a space regulatory/technical expert in Geneva. The Radiocommunication Bureau renews its thanks to the Administration of Japan for the specific assistance in the development of this project.

### 7.3.3 Development of a tool to assist administrations in communicating to the Bureau the coordination status with respect to affected administrations at notification

The development of the tool to assist administrations in communicating the coordination status started in June 2021 and the tool is expected to be launched in April 2022. The tool will be implemented as user-friendly “wizards” within the SpaceCap software. SpaceCap will feature an interface that displays the coordination requirements of the satellite network being notified and will allow the user to easily maneuver within the notice to capture the coordination status with respect to an affected administration at the group level of a notice. The new software features will also include “wizards” to help create notices for space station notification submissions in the following cases:

* First notification under No. **11.2** for frequency assignments which are subject to coordination;
* Resubmission of notification after a notice has been returned under No. **11.37** or No. **11.38**;
* First notification under No. **11.2** for frequency assignments that are not subject to coordination.

In addition, a new Notification Resubmission interface will be created in the e-Submission web portal to further support the update of coordination status with an affected administration at the resubmission of a notice.

### 7.3.4 Implementation of Resolution 35 (WRC-19): A milestone-based approach for the implementation of frequency assignments to space stations in a non-geostationary-satellite system in specific frequency bands and services

The Bureau has implemented an online system for the submission of deployment information required under Resolution **35 (WRC-19)**. A database structure was developed for the storage of this information, and a user-friendly online interface for the capture of the deployment information was provided through the existing e-Submission system. In addition, an XML file format was defined such that administrations are able to capture the information in a standardized format using offline tools and submit them through the e-Submission system. Administrations are able to validate the information using the online validation tool provided within the e-Submission system to check the completeness and correctness of the information.

As required under resolves 5a) and 10a) of Resolution 35 (WRC-19), upon receipt of the required deployment information, the information is made available “As received” on the following website: <https://www.itu.int/ITU-R/space/asreceived/Publication/AsReceived>.

After processing the information, the Bureau publishes the RES 35 Special sections in the BRIFIC DVD as well as on the website of the Bureau.

Further development of the system will continue in 2022 to assist in the internal processing and publication of the information, which is now done using a temporary solution.

The implementation of Resolution **35 (WRC-19)** is described in the [Circular Letter CR/475](https://www.itu.int/md/R00-CR-CIR-0475/en) dated 17 May 2021, and the Bureau maintains a webpage to provide comprehensive, up to date information on the implementation of this Resolution: <http://www.itu.int/go/space/res35>.

### 7.3.5 Implementation of Resolution 32 (WRC-19): Regulatory procedures for frequency assignments to non-geostationary-satellite networks or systems identified as short-duration missions not subject to the application of Section II of Article 9

As part of the implementation of Resolution **32 (WRC-19)**, which required the Bureau to publish the characteristics of the system together with the findings under No. **11.31** in the International Frequency Information Circular (BR IFIC) and on its website, the Bureau maintains a webpage which provides some background information on this resolution, as well as a link to the notification publications of satellite networks submitted as short-duration missions in accordance with Resolution **32 (WRC-19)**:

<https://www.itu.int/en/ITU-R/space/support/nonGSO/RES32/Pages/default.aspx>

### 7.3.6 Migration of the BRIFIC (Space services) from a DVD format to an online mechanism

Following the obsolescence of one of the software technologies currently used in the implementation of the BRIFIC (Space Services) DVD, the Bureau has been working on a project to migrate the BRIFIC (Space Services) from a DVD format to an online delivery mechanism. A preliminary study was carried out in 2021, and a prototype is currently under development. The BRIFIC (Space Services) online will facilitate the viewing and downloading of the special sections and Parts in PDF formats, querying the data for all publications within that BRIFIC, with a user-friendly online interface, and a secure server that can provide different groups of users various levels of access.

**7.3.7 Improvements to the BR Space Software installation on end-user computers**

Based on constructive feedback received from several administrations, the BR has improved the way BR Space Software is installed on end-user computers, as follows:

* ITU digital signature is applied to all software components developed in-house;
* All software components are regularly scanned for viruses;
* All non-ITU software components are either digitally signed by the third-party provider or documented and proposed for whitelisting by the IT department on the end-user side;
* The installer respects conventions for naming of directories on Windows specified by Microsoft;
* The installer has a “silent” mode for automation of installation by end users’ IT departments;

## 7.4 Software developments related to terrestrial services and other BR software and tools

### 7.4.1 Radio Regulations tools

The Bureau continues to update and maintain software tools to facilitate the use and analysis of the Radio Regulations (RR):

1. The Radio Regulation Navigation Tool, which was released during Q2-2017, is based on the active version of the RR and ITU-R Recommendations. The updated version incorporating WRC-19 outcomes and aligning with the most recent corpus of texts (RR 2020, ITU-R Recommendations, Rules of Procedure, etc.) was finalized. This was released during the last quarter of 2021 and is now available for download and purchase at the ITU sales website. Yearly free updates will be released to incorporate the latest versions of the RoP when available.
2. The software tool to conduct detailed search and analysis of the Table of Frequency Allocations in Article 5 of the Radio Regulations, enables filtering and reformatting by frequency range, service, category of service, footnote, country, etc. The tool has been updated based on the outcomes of the WRC-19 and the RR 2020 Edition to introduce the changes into the frequency allocations, country footnotes, and related references to associated Resolutions and Recommendations. The updated package now also includes links to the relevant ITU-R Recommendations referenced in RR5, as well as the relevant Rules of Procedure. The package is now also equipped with a utility to extract the National Table of Frequency Allocations for a specific country as it results from combining the various provisions of RR5. Throughout 2021, the tool was demonstrated during various Radiocommunication Regional Seminars. It is available for purchase at the ITU sales website. All software and data updates will be provided regularly and freely to the subscribers, until the WRC-23.

### 7.4.2 Further enhancement of web tools

The online tools eBroadcasting (former eBCD2.0) and eMIFR were integrated into the eTerrestrial portal, implemented with the latest web technologies, and put in production in December 2020. The Online Validation (rebranded to eValidation) was integrated in the last quarter of 2021, as well as new features like a Dashboard to allow the BR and users to monitor their activities. The eBroadcasting tools developed to support the GE84 optimization process were instrumental to the success of this activity. Maps are implemented using the open source OpenLayers library, chosen by the BR Task Force (see 7.4.4)

### 7.4.3 Compatibility analysis software for FM sound broadcasting – GE84 optimization

The BR deployed in 2021 an eBroadcasting online tool for the GE84 Plan (FM broadcasting) optimization in Africa in the band 87.5-108 MHz: the GE84 Optimization tool. This tool performs compatibility calculations based on the GE84 Agreement and evaluates the incompatibilities for all the frequencies in the GE84 band. The aim is to identify possible new channels based on the calculations of interference received and generated with respect to the GE84 Plan entries and any other frequency requirements which may be submitted to the analysis. This tool, which integrates powerful mapping capabilities, serve as the basis for optimizing the FM band in Africa. It has been made available to all administrations party to the GE84 Agreement.

In 2021, the GE84 optimization and compatibility analysis tools have been enhanced to provide new functionality to evaluate the prediction of point-to-point interference using the method described in Recommendation ITU-R P.1812 in conjunction with a digital terrain map (SRTM3) with 90 m resolution.

### 7.4.4 BR Geographic Information Systems

The BR GIS Task Force, comprised of staff from all BR departments, has been established to harmonize GIS activities in the BR. An initial activity of the Task Force was to implement the BR GIS Platform using GeoServer. Its current activity is to transfer all relevant radio-meteorological data (geospatial data catalogue) and other relevant datasets currently in the IDWM to the server. This data will be made available to users via Open Geospatial Consortium (OGC) compliant web services. The BR is implementing GIS functionalities in its web tools using the open source OpenLayers library.

The ITU is a member of the UN Geospatial Network, a coalition of entities within the UN system that is tasked to strengthen the coordination and coherence of geospatial information management within the United Nations system. The BR participates in the Steering Committee of this network and leads the ITU Inter-Sectorial Task Force on Geospatial Information Management.

#### 7.5 Business Continuity and Disaster Recovery (both Space and Terrestrial Services)

Work on further strengthening the ITU Risk Management Framework continued in 2021, with the BR's full participation in the Inter-Sectoral Task Force Working Group on Risk Management. In addition, BR management took part in several workshop sessions organized by the ITU Organizational Resilience Management System (ORMS) coordinator involving an external consulting company who are experts in the modelling of relationships between business-critical functions using a custom augmented version of Business Process Modelling (BPM) notation. This activity will continue with training sessions in May 2022.

# 8 Outreach

Outreach activities include dissemination of information and assistance to membership, the publication of ITU-R outputs, the organization of, and the participation in, seminars and workshops, as well as the development and maintenance of communication and promotion tools. The purpose of these activities is to ensure that the outputs produced by the ITU-R Sector (regulations, recommendations, reports, and handbooks) are disseminated worldwide so that they may form the basis for the formulation of national and regional policies and decisions for the use of the radio spectrum. To carry out these activities, the BR relies on close cooperation with the other Bureaux and Sectors, the ITU regional and area offices, and the relevant international organisations and national authorities.

## 8.1 Publications

### 8.1.1 Regulatory publications

*Radio Regulations and Rules of Procedure*

The 2020 edition of the Radio Regulations was published in September 2020. Following the 2019 World Radiocommunication Conference, a 2021 edition of the Rules of Procedure has been published. One update was published since then (October 2021).

BR also published 11 HFBC schedules every year in accordance with RR Article **12**.

### 8.1.2 Service publications

#### 8.1.2.1 Background and general observations

#### The Bureau prepares and issues the following service publications, as specified in Article 20 of the Radio Regulations.

* BR IFIC − International Frequency Information Circular
* List IV − List of Coast Stations and Special Service Stations
* List V − List of Ship Stations and Maritime Mobile Service Identity Assignments
* List VIII − List of International Monitoring Stations
* Manual for Use by the Maritime Mobile and Maritime Mobile-Satellite Services

#### 8.1.2.2 List of Coast Stations and Special Service Stations (List IV)

#### This List contains information notified to the ITU (i.e. Call Sign, MMSI, geographical coordinates, transmitting and receiving frequencies, etc.) of coast stations that provide watch-keeping using digital selective calling techniques, public correspondence service, medical advice, navigational and meteorological warnings, notices to navigators and radio time signals, etc.

#### The List of Coast Stations and Special Service Stations (List IV) is published every two years, in CD‑ROM format. One edition of List IV was published in December 2021.

Information pertaining to this list is made available via the online information system ITU Maritime mobile Access and Retrieval System (MARS). A compilation of all changes notified to the ITU is provided on the web every six months.

#### 8.1.2.3 List of Ship Stations and Maritime Mobile Service Identity Assignments (List V)

This List contains information notified to the ITU on Ship, Coast and Search and Rescue (SAR) Aircrafts Stations, Accounting Authority Identification Codes (AAICs), and contact information of notifying administrations.

The List of Ship Stations and Maritime Mobile Service Identity Assignments (List V) is published every year, in CD‑ROM format. One edition of List V was published in April 2021.

Information pertaining to this List is also made available via the online information system MARS. A compilation of all changes notified to the ITU is provided on the web every three months.

#### 8.1.2.4 List of International Monitoring Stations (List VIII)

#### The List of International Monitoring Stations (List VIII) contains the addresses and other relevant information of centralizing offices, including the detailed information related to monitoring stations measuring terrestrial and space emissions. A direct download facility is available, free of charge, with TIES access.

One edition of this List was published in December 2019

#### 8.1.2.5 List of service publications issued

Table 8.1.2.5-1 below summarizes the different publications for the period 2018-2021:

Table 8.1.2.5-1

Summary information regarding the service publications issued in the period 2018 – 2021

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 2018 | 2019 | 2020 | 2021 |
| BR IFIC (International Frequency Information Circular) | 25 | 25 | 26 | 25 |
| List IV (List of Coast Stations and Special Service Stations) |  | Edition of 2019 (December)  |  | Edition of 2021 (December)  |
| List V (List of Ship Stations and Maritime Mobile Service Identity Assignments) | Edition of 2018 (April) | Edition of 2019 (April) | Edition of 2020 (April) | Edition of 2021 (April) |
| List VIII (List of International Monitoring Stations) |   |  Edition of 2019 (December) |  |   |
| Maritime Manual |   |   | Edition of 2020 (November)  |  |

### 8.1.3 Study Groups publications

Since RAG-21, the ITU‑R Study Groups publications continued to be developed in accordance with Resolution ITU-R 1-8.

The full list of ITU-R Questions, ITU-R Recommendations and ITU-R Reports approved since RAG‑21 can be found in Addendum 1 to this document.

#### • ITU-R Questions

Since RAG-21, four new and one revised ITU-R Questions were approved in accordance with the procedures established in Resolution ITU-R 1-8 and published.

#### • ITU-R Recommendations

Since RAG-21, five new ITU-R Recommendations and 46 revised ITU-R Recommendations were approved in accordance with the procedures established in Resolution ITU‑R 1-8 and published on the ITU website in English. Publication in 6 languages for a few of these ITU-R Recommendations is in progress.

#### • ITU-R Reports

Since RAG-21, 17 new and 31 revised ITU-R Reports were published on the ITU website in English.

#### • ITU-R Handbooks

Since RAG-21, WP 5A revised and approved the Handbook on Land Mobile (including Wireless Access) − Volume 4: Intelligent Transport Systems. SG 6 also approved a Handbook on Digital Terrestrial Television Broadcasting networks and systems implementation. In addition, WP 5D updated the “Handbook on Global Trends in IMT” to include the IMT-2020 radio interfaces, now to become the “Handbook on IMT”.

### 8.1.4 ITU-R Publications downloads

#### 8.1.4.1 Radio Regulations and the Rules of Procedure

Concerning these regulatory documents, Table 8.1.4.1-1 shows the number of deliveries for the RR‑2016 and RR-2020 editions. Following up on the request of the 2021 RAG meeting, both pdf and WORD versions of the RR-2020 edition are available for free download from the ITU website [here](https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-REG-RR-2020&media=electronic) and WORD versions are also available for free download from [here](https://www.itu.int/hub/publication/r-reg-rr-2020/). Table 8.1.4.1-2 shows the total number of downloads during the same period for the Rules of Procedure. The 2021 edition of the Rules of Procedure was published in June 2021, taking into account the decisions of WRC-19. The edition has subsequently received one update as a result of new and modified rules of procedure approved by the Radio Regulations Board.

Table 8.1.4.1-1

Number of deliveries of the Radio Regulations

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **RR-16** | **2018** | **2019** | **2020 (2016 ed and 2020 ed)** | **2021RR-20** |
| **Hard copies sold** | 257 | 182 | 2016 ed:  59  2020 ed: 1 170 | 274 |
| **DVD’s sold** | 1 264 | 1 063 | 2016 ed: 482  2020 ed: 5 061 | 3 855 |
| **Free downloads** | 39 766 | 47 974 | 2016 ed: 36 416 2020 ed: 4 236 | 18 092 |
|  |  |

Table 8.1.4.1-2

The Rules of Procedure (downloads)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **2018** | **2019** | **2020** | **2021** |
| **ROP(Rules of Procedure)** | 7 501 | 10 014 | 10 882 | 10 539 |

#### 8.1.4.2 ITU-R Recommendations

As a result of the free online access policy, ITU-R Recommendations are accessed and downloaded worldwide. From January 2018 to December 2021, more than seven million downloads of ITU-R Recommendations, from the ITU website, were recorded. Table 8.1.4.2-1 summarizes their distribution by year and series. At this time, there are 1 178 ITU-R Recommendations in force.

Table 8.1.4.2-1

Distribution of ITU-R Recommendations (downloads)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| SERIES | 2018 | 2019 | 2020 | 2021 | TOTAL | % |
| P | 411176 | 402898 | 385614 | 400114 | **1599802** | 21.00% |
| M | 405769 | 374486 | 327720 | 354232 | **1462207** | 19.20% |
| BT | 281431 | 264701 | 226737 | 228103 | **1000972** | 13.14% |
| SM | 199430 | 175154 | 171165 | 191538 | **737287** | 9.68% |
| F | 229326 | 189609 | 154672 | 144499 | **718106** | 9.43% |
| BS | 160218 | 153757 | 142699 | 162225 | **618899** | 8.12% |
| S | 146531 | 131723 | 108174 | 121407 | **507835** | 6.67% |
| SA | 65514 | 57009 | 46718 | 42129 | **211370** | 2.77% |
| V | 39066 | 39807 | 40634 | 46534 | **166041** | 2.18% |
| BO | 41999 | 35531 | 26816 | 22679 | **127025** | 1.67% |
| RS | 33523 | 31459 | 26823 | 22468 | **114273** | 1.50% |
| TF | 29038 | 24546 | 24077 | 22264 | **99925** | 1.31% |
| SF | 29677 | 23507 | 19381 | 16436 | **89001** | 1.17% |
| BR | 30271 | 21989 | 17101 | 14703 | **84064** | 1.10% |
| RA | 17450 | 15165 | 12315 | 10546 | **55476** | 0.73% |
| SNG | 6396 | 4921 | 3319 | 2499 | **17135** | 0.22% |
| IS | 2115 | 1802 | 1280 | 1347 | **6544** | 0.09% |
| PI | 446 | 511 | 372 | 200 | **1529** | 0.02% |
| TOTAL | **2129376** | **1948575** | **1735617** | **1803923** | **7617491** | 100.00% |

 |
|  |

#### 8.1.4.3 ITU-R Reports

As ITU-R Recommendations, ITU-R Reports have been promulgated worldwide touching most of the audiences and contributing to good technical practices in certain aspects of radiocommunications. From January 2018 to December 2021, more than one million downloads of ITU‑R Reports, from the ITU website, were recorded. Table 8.1.4.3-1 summarizes their distribution by year and series. Currently, there are 596 ITU-R Reports in force.

Table 8.1.4.3-1

Distribution of ITU-R Reports (downloads)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| SERIES | 2018 | 2019 | 2020 | 2021 | TOTAL | % |
| M | 96801 | 99347 | 105681 | 114654 | **416483** | 28.82% |
| SM | 68622 | 89031 | 101965 | 143421 | **403039** | 27.89% |
| BT | 58103 | 57545 | 59805 | 71374 | **246827** | 17.08% |
| BS | 23469 | 22755 | 28707 | 33466 | **108397** | 7.50% |
| P | 14660 | 12616 | 14785 | 17537 | **59598** | 4.12% |
| BO | 13572 | 12657 | 14003 | 16049 | **56281** | 3.89% |
| F | 11857 | 13398 | 12411 | 14513 | **52179** | 3.61% |
| S | 7784 | 9469 | 10001 | 9494 | **36748** | 2.54% |
| SA | 5557 | 6424 | 5547 | 8830 | **26358** | 1.82% |
| RS | 4455 | 4138 | 4796 | 6100 | **19489** | 1.35% |
| RA | 4785 | 4174 | 4222 | 4650 | **17831** | 1.23% |
| SF | 516 | 331 | 387 | 385 | **1619** | 0.11% |
| BR | 105 | 99 | 72 | 61 | **337** | 0.02% |
| TF |  |  |  | 76 | **76** | 0.01% |
| TOTAL | **310286** | **331984** | **362382** | **440610** | **1445262** | 100.00% |
|  |

#### 8.1.4.4 Handbooks

Following the BR director’s decision in 2017, all ITU-R Handbooks are now free to download at the ITU website. With a steady increase since 2018 More than 100 000 downloads were registered in 2021. Table 8.1.4.4‑1 provides the distribution of ITU-R Handbooks on spectrum management series as well as other handbooks that are sold.

At this time, a total of 46 ITU-R Handbooks are published including the Spectrum Management Series.

Table 8.1.4.4-1

Distribution of ITU-R Handbooks on spectrum management series and other Handbooks

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Handbook** | **2018** | **2019** | **2020** | **2021** |
| **Spectrum Management Series (hard copies sold)** | 9 | 9 | 3 | 5 |
| **Other Handbooks (hard copies sold)** | 21 | 20 | 4 | 5 |
| **GRAND TOTAL** | **30** | **29** | **7** | **10** |
|  |  |  |  |  |
| **FREE downloads** | **28 168** | **68 507** | **79 961** | **126 201** |

## 8.2 Seminars, workshops and other events

Since 2020, a new cycle of WRS/RRS events in the interim period between WRCs has started: WRS/RRS 2020-2023. Those Seminars aim at disseminating worldwide the updates contained in the Radio Regulations Ed. 2020 (with the decisions taken by WRC-19) along with its associated Rules of Procedure (RoP). Based on the prior WRS/RRS experiences, this WRS/RRS 2020-2023 cycle plans to conduct two biennial World Radiocommunication Seminars (WRS), complemented by eleven Regional Radiocommunication Seminars (RRS) (each one aimed to a different subregion), as follows:

TABLE 8.2.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Language** | **2020** | **2021** | **2022** | **2023** |
| **Africa (Sub-Saharan): 2** |   |  |  |  |  |
| French Africa | English/French  |  | 5-16 JulyOnline |  |  |
| English Africa  | English/French  |  |  |  | 1Q |
| **Americas: (3)** |  |  |  |  |  |
| South America | Spanish |  | 26 April-7 MayOnline |  |  |
| Meso America  | Spanish |  |  |  | 2Q |
| Caribbean  | English | 13-24 JulyOnline |  |  |  |
| **Asia & Pacific: (3)** |  |  |  |  |  |
| Pacific Islands States | English |  |  | October |  |
| Central Asia | English |  |  |  | 2Q |
| South Asia | English | 11-22 OctoberOnline |  |  |  |
| **Arab States (1)** | Arab/English |  |  | 13-24 MarchOnline |  |
| **CIS (1)** | Russian |  |  | 2Q |  |
| **Eastern Europe (1)** | English/Russian |  |  |  | 2Q |
| **WRS (2)** | six UN official languages | 30 November-11 DecemberOnline Eastern Hemisphere: morningWestern Hemisphere: afternoon |  | 24-28October |  |

As in prior cycles, to optimize the necessary resources, this planning has the following principles:

* 1st semester 2020: no RRS/WRS, updating RR and associated software tools;
* 2nd semester 2023: no RRS/WRS: preparation of upcoming WRC-23;
* Two WRS per cycle (every 2 years): WRS-20 and WRS-22;
* The first WRS after a WRC (WRS-20) had a specific session devoted to explaining in detail, the modifications on the RRs introduced by the WRC;
* The two RRSs for Africa are scheduled in different years than the WRS, considering that the participation in RRS Africa is nearly twice as large as other RRSs, and allowing for an even distribution of the fellowship budget;
* RRSs are carried out in the predominant language(s) of the region, which helps reduce interpretation costs and allows for an easier exchange of information during the event;
* The programs of the RRSs are tailored to the specific needs of the region concerned;
* The last day(s) of each RRS are devoted to a Forum-type session, where panellists from outside the region could be invited to enlarge the scope of the discussions (provision of interpretation from/to English might become necessary for those days).

The above planning has been duly coordinated/and adjusted with ITU Regional Offices (ROs) as well as pertinent regional groups, considering the challenges arisen by the current outbreak and the subsequent changes of format (online events), and its implications on the involved ITU Staff (BR, ROs).

**8.2.1** **World Radiocommunication Seminars (WRS)**

As a part of the WRS/RRS 2020-2023 cycle, the WRS-20 was conducted in December 2020 as a fully virtual event over a two-week period, with the plenary sessions that were held during the first week made open to everyone. In 2021, the BR curated the contents of the WRS-20 Plenary Sessions and presented it on the ITU-R website as the “Best of WRS20” (BoWRS20) on demand seminar at https://www.itu.int/bestofwrs/. The BoWRS20 website provides a [library](https://www.itu.int/bestofwrs/sessions/library/) where all materials are available, as well as links to each of the following virtual sessions:

* [General Overview](https://www.itu.int/bestofwrs/sessions/general-overview/)
* [Radio Regulations](https://www.itu.int/bestofwrs/sessions/radio-regulations-rr/)
* [Terrestrial Services](https://www.itu.int/bestofwrs/sessions/terrestrial-services/)
* [Space Services](https://www.itu.int/bestofwrs/sessions/space-services/)
* [ITU-R Study Groups](https://www.itu.int/bestofwrs/sessions/itu-r-study-groups/)

Each virtual session provides access to the videos, in all six ITU languages, and the downloadable presentations from the WRS20. Additionally, the kick-off event for the Network of Women for WRC23 (NOW4WRC23) can be viewed from the Best of WRS20 website. To facilitate the reuse and redistribution of the Best of All of the materials provided on this website are licensed under a [Creative Commons Attribution 3.0 IGO License](http://creativecommons.org/licenses/by/3.0/igo/).

**8.2.2** **Regional Radiocommunication Seminars (RRS)**

As a complement to the biennial WRS, the BR maintained its strategy for regional outreach through the organization of Regional Radiocommunication Seminars (RRS) aimed to visit every developing region worldwide, fostering human capacity building on the use of the radio-frequency spectrum and satellite orbits, in particular the application of the provisions of the ITU Radio Regulations.

RRSs are jointly organized with the spectrum management authorities of host countries, in close cooperation with relevant regional organizations and the ITU regional/areas offices. Their agendas include two days of theoretical sessions and one or two days of workshops on terrestrial and space services. They are complemented with a one or two-day forum, dedicated to spectrum-related topics of particular interest to the region.

In 2021, three RRS were conducted as follows:

* **ITU Regional Radiocommunication Seminar 2021 for the Americas (RRS-21-Americas)**

The ITU Regional Radiocommunication Seminar 2021 for the Americas Region (RRS-21 Americas) was organized by ITU (BR and Americas Office) in collaboration with the Inter-American Telecommunication Commission (CITEL) and the Colombian National Spectrum Agency (ANE) from 26 April to 7 May 2021. The Seminar was held in a virtual format with a 3‑hour daily session during weekdays only.

A Zoom license from ITU was used to conduct the e-meeting. Considering the local time difference, sessions were conducted from 08:00 to 11:15 (UTC -5H), i.e., from 14:00 to 17:15 Geneva time.

The lectures and discussions during RRS-21-Americas were in Spanish except for some material such as presentations and software tools that were available in English only.

The seminar covered plenary sessions and performed tutorials on the process of coordination and notification. RRS-21-Americas concluded with a 4 half-day Forum on *“Modern spectrum management in the Region*”, gathering the main stakeholders in the region. The addressed topics include: Newest trends on Audio Broadcasting, mini and micro satellites, National Plan for Emergency Communications, new sensors and higher bands for Modern Spectrum Monitoring, 5G Spectrum Pricing, Spectrum Licensing models, as well as trends and challenges of Cognitive Radio and Software, Defined Radio systems. The Seminar concluded with a Round Table on the Regional Scope of the WRC-19 Outcomes and WRC-23 Agenda Challenges.

The event was attended by more than 240 participants from 49 entities, including 22 countries from the Americas region, which shows the great success of this event.

* **ITU Regional Radiocommunication Seminar 2021 for Africa (RRS-21-Africa)**

The Regional Radiocommunication Seminar 2021 for Africa (RRS-21-Africa) was organized by ITU (BR and Africa Office) in cooperation with the African Telecommunications Union (ATU) from 5 to 16 July 2021. The Seminar was held in an online format with 3-hour daily sessions during the weekdays only.

A Zoom license from ITU was used to conduct the e-meeting. Considering the local time difference, sessions were conducted from 10:00 to 13:15 (UTC + 2H), i.e., from 12:00 to 15:15 Geneva time.

The lectures and discussions during RRS-21-Africa were in English and French, with simultaneous interpretation.

The first part of the Seminar covered spectrum management, Master International Frequency Register (MIFR), RR, World Radiocommunication Conference, Radiocommunication Assembly and agenda of WRC-23. This also included training on ICT tools for frequency notifications as well as information on BR and BDT spectrum management activities. Moreover, tutorials were carried out on the use of these tools for notification procedures of terrestrial stations and space stations.

RRS-21-Africa concluded with a 4 half-day Forum on *“Radiocommunications Trends: Opportunities and challenges for the Region”*, gathering main stakeholders in the region. The addressed topics include: Tools available on the National Frequency Allocations Tables (NFAT) including the RR Article 5 Software and the National Frequency Allocations Tables, new sensors and higher bands for Modern Spectrum Management and Monitoring, newest trends on Audio Broadcasting and optimisation of GE84 Agreement, National Plan Frameworks for Emergency Communications, Spectrum bands, regional harmonization and experiences in Africa and other regions on 5G deployment challenges in Africa, Terrestrial broadband systems including Fixed, HAPS/HIBS, RLAN, etc., Satellite Systems including broadband satellite (GSO and non-GSO), ESIM and small satellites. The Forum concluded with a Round Table on the Regional scope on WRC-23 Agenda Challenges.

As in other RRS online, participation largely exceeded expectations: the event was attended by almost 220 participants from over 68 entities, including 39 countries from the African Region, which shows the great success of this event.

* **ITU Regional Radiocommunication Seminar 2021 for Asia and the Pacific (RRS‑21‑Asia&Pacific)**

The Regional Radiocommunication Seminar 2021 for Asia and the Pacific (RRS-21 Asia&Pacific) was organized by ITU (BR and Asia&Pacific Office) in cooperation with the Asia Pacific Telecommunity (APT). The RRS-21-Asia&Pacific was conducted online from 11 to 22 October 2022, using a Zoom license from ITU. Considering the local time difference, sessions were conducted from 13:15 to 16:45, Bangkok time (UTC+7H), i.e., 07:15 to 10:45 Geneva time.

The lectures and discussions during RRS-21-Asia-Pacific were in English only.

The seminar covered plenary sessions and performed tutorials on the process of coordination and notification. RRS-21-Asia&Pacific concluded with a 4 half-day Forum on *“Radiocommunications Trends: Opportunities and Challenges for the Region*”, gathering main stakeholders in the region. The Forum topics included: Tools available on the National Frequency Allocations Tables (NFAT), Modern Spectrum Management and Monitoring, Digital Terrestrial Broadcasting, National Plan Frameworks for Emergency Communications, Trends on IMT-2020 (5G), Terrestrial broadband systems such as Fixed, HAPS/HIBS, RLAN, etc., Satellite Systems including broadband satellite (GSO and non-GSO), ESIM and small satellites. The Forum concluded with a Round Table on the Regional scope on WRC-23 Agenda Challenges.

As in prior RRS online, participation largely exceeded expectations: the event was attended by almost 300 participants from over 58 entities, including 20 countries from the Asia-Pacific region, which shows the great success of this event.

Table 8.2.2-2 provides a summary of the RRSs held in 2021.

Table 8.2.2-2

ITU Regional Radiocommunication Seminars (2021)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Date | RRS | Place | Host | Cooperation | Forum Topics | Lang. | Parts/Adms |
| **2021** |
| 26 April - 7 May 2021 | RRS-21 Americas | E-meeting | − | Inter-American Telecommunication Commission (CITEL)  Colombian National Spectrum Agency (ANE)ITU Americas Office | • Newest trends on Audio Broadcasting.• Mini and micro satellites: non-GSO satellite systems/short-duration missions.• Harmonizing Band Plans and National Plans for Emergency Communications.• New sensors and higher bands for Modern Spectrum Monitoring.• 5G Spectrum Pricing: <1GHz; 1 to 6 GHz; mm waves.• Spectrum Licensing models: Light licenses; secondary market, secondary access; opportunistic use non-licensing.• Trends and challenges of Cognitive Radio and Software Defined Radio Systems.• Round Table on Regional scope on WRC-19 Outcomes and WRC-23 Agenda Challenges. | S | 238/49 |
| 5-16 July 2021 | RRS-21-Africa | E-meeting | − | African Telecommunications Union (ATU)ITU Africa Office | • Tools on National Frequency Table Allocations and RR Article 5 Viewer.• New sensors and higher bands on Modern Spectrum Monitoring.• Newest trends on Audio Broadcasting and Optimisation of GE84 Agreement.• National Plan Frameworks for Emergency Communications.• Spectrum bands; Regional Harmonization, experiences in Africa and other regions regarding 5G deployment challenges in Africa.• Other terrestrial broadband systems: Fixed; HAPS/HIBS; RLAN.• Satellite Systems: Broadband satellite (GSO and N-GSO); ESIM; Small satellites.• Round Table on Regional scope on WRC-19 Outcomes and WRC-23 Agenda Challenges. | E & F | 217/68 |
| 11-22 October 2021 | RRS-21 Asia-Pacific | E-meeting | − | Asia-Pacific Telecommunity (APT)ITU Asia&Pacific Office | • Tools on National Frequency Table Allocations.• Modern Spectrum Management and Monitoring.• Digital and Terrestrial Broadcasting for TV and Audio.• National Plan Frameworks for Emergency Communications.• Trends on IMT-2020 (5G).• Other terrestrial broadband systems: Fixed; HAPS/HIBS; RLAN.• Satellite Systems: Broadband satellite (GSO and N-GSO); ESIM; Small satellites.• Round Table on Regional scope on WRC-19 Outcomes and WRC-23 Agenda Challenges. | E | 287/58 |

### 8.2.3 Planned World and Regional Radiocommunication Seminars for 2022-2023

Based on the WRS/RRS 2020-2023 planning (Table 8.2.2-1), the following seminars are being considered for 2022:

* RRS-22-Arab States; 13 to 24 March 2022, online, A/E
* RRS-22-Eastern Europe: second or third quarter of 2022 (TBD), physical if possible (TBC)
* RRS-22-Asia&Pacific: October 2022, physical if possible (TBC)
* WRS-22: 24 to 28 October 2022, physical

As indicated above, this 2022 planning is currently coordinated/and adjusted with ITU ROs as well as pertinent regional groups, considering the challenges that have arisen due to the SARS-CoV-2 outbreak and the subsequently necessary changes in the delivery format for these events.

### 8.2.4 Other events

BR experts kept attending and providing support to several events such as those organized by Specialized UN Agencies and by Regional Telecommunication Organizations, as well as non-ITU Conferences and Symposia. The BR also organized Seminars and Workshops and responded to Assistance requests from the Member States. Due to the travel restrictions arising from the SARS-CoV-2 outbreak, almost all meetings were conducted online, including large events such as:

* SADC Capacity Building Workshop on Satellite issues
* ITU/ATU Workshop on implementation of WRC-19 agenda item 1.4
* ITU/PRIDA Workshops on Spectrum Management – E/F
* ITU/PRIDA Workshops on IoT and digital services – E/F
* ITU Reg. Sem. Europe & CIS - Spectrum & Broadcast
* Workshops CG 1 to 4 -GE84 Plan optimization for African countries – E/ F
* ITU/ITSO Training for Americas
* ITU Workshop on Spectrum Monitoring for the Arab Region

## 8.3 Assistance to the Member States, in particular in developing countries and LDCs

### 8.3.1 Assistance to administrations of developing countries

The Bureau continued assisting Administrations of developing countries in areas such as:

* Supporting national spectrum management activities in the rapidly changing regulatory environment (see Resolution **7 (Rev.WRC-19)**) and providing technical assistance in the field of space radiocommunication (Resolution **15 (Rev.WRC-03)**) either in ITU headquarters or in the field.
* Participation in the meetings of the regional coordination groups, as requested by Article 12 of the Radio Regulations.
* Provision of assistance in long-term spectrum roadmap for mobile broadband and assignment for mobile broadband (IMT)
* Provision of guidelines and technical support for the transition to Digital Television and the allocation of the digital dividend.

During 2020 direct technical assistances in progress were concluded. No new direct requests were received.

### 8.3.2 Assistance to Regional Groups

The BR continued its participation in the meetings of the regional coordination groups (e.g. HFCC), as requested by Article 12 of the Radio Regulations, providing the necessary assistance and collaboration, as follows:

#### 8.3.2.1 Assistance to ATU

**GE84 Plan optimization project for Africa:** The Bureau in collaboration with ATU launched a process for the optimization of the GE84 Plan for African countries in 2019 and completed this work on 28 January 2022. The main purpose of this optimization was to achieve efficient and equitable use of the 87.5-108 MHz (FM) band for analogue sound broadcasting and to allocate new frequencies to FM broadcasting to meet the increasing need for additional frequencies in African countries.

The outcomes of the GE84 Plan optimization for Africa project exceeded expectations. The 85 % success rate for submitted FM frequency assignments means 18,326 assignments in total can now be used without harmful interference.

**PRIDA**: The Policy and Regulatory Initiative for Digital Africa (PRIDA) project, is an initiative by the African Union, European Union and ITU. It also includes Regional Economic Communities, ATU, Regional Regulatory Associations, National Regulators, and other stakeholders. The BR, jointly with BDT are actively participating in the Action "*Increasing wireless broadband penetration through improved and harmonized spectrum utilization and regulations*". In that sense, during 2021 five meetings were conducted:

* Validation Workshop for PRIDA technical reports and guidelines: online 9-11 March 2021
* Workshop on the preparation of the National Frequency Table of Allocations (NFTA): online May 24 - 27, 2021
* National Tables of Frequency Allocation: Activity 2 - Technical assistance provided
* Harmonised Calculation Method for Africa (HCM4A) Validation workshop: Nov. 29- Dec. 2, 2021
* PRIDA Focal Points Meeting: Online, 19 October 2021

## 8.4 Strategic Partnerships, including inter-sector cooperation

Due to the SARS-CoV-2 outbreak only one ITU/ITSO online capacity building programme on Satellite Communications was held in 2021. The six-week, instructor-led online course, “Satellite Communications and Radio Regulations Procedures” was held from 4 October to 12 November 2021. Its primary objective was to raise awareness amongst individuals, organizations and institutions on policies, regulations, licensing frameworks and technical aspects associated with the provision of satellite communications services. This programme is part of a capacity-building partnership between the ITU and ITSO for the delivery of satellite communications-related training.

### 8.4.1 Cooperation with ITU-D

BR works closely with the BDT on issues of mutual interest to ITU-R and ITU-D. The BR has participated in relevant meetings of ITU-D Study Groups, Rapporteur Groups, and TDAG, where liaison activities have involved topics such as spectrum management, digital broadcasting and migration from analogue systems, the transition towards and implementation of IMT, and broadband wireless access technologies.

#### 8.4.1.1 GSR

The BR contributed to the ITU Global Symposium of Regulators in 2021 by participating in a panel discussion that focused on regulatory enablers for connectivity, including the importance of sharing: spectrum, networks, infrastructure co-deployment, how to balance affordability, Return on Investment and technologies innovation, and why regulation matters.

#### 8.4.1.2 World Telecommunication/ICT Indicators Symposium, WTIS

The WTIS was not held in 2021.

#### 8.4.1.2 ICT Survey and ICT Eye

The BR cooperated with the BDT on the indicators and definitions for gathering data on mobile broadband technologies and standards by participating in the meetings of the Ad-Hoc Group of the Expert Group on Telecom-ICT Indicators (EGTI).

In 2021, the EGTI meeting was conducted online from 13 to 15 September 2021. The IMT spectrum-related indicators were discussed. EGTI 2021 meeting agreed to

1. add as new indicators:
	1. active mobile broadband subscriptions to 5G/IMT-2020, and
	2. mobile cellular subscriptions with access to 5G/IMT-2020, as a new sub-indicator of active mobile cellular subscriptions
2. refine the scope of the following existing indicators as proposed in the subgroup report:
	1. active mobile subscriptions with 4G/LTE (this will include any more advanced technology)
	2. active mobile broadband subscriptions (this will include any bb with 5G/IMT-2020)
	3. active fixed-broadband subscriptions (this will include 5G/IMT-2020 -supported fixed wireless broadband);
3. Collect data on spectrum blocks assigned to SG, when reporting the indicator “total spectrum assigned for each of the three main blocks” by indicating *a)* what specific spectrum band has been assigned for 5G, and *b)* how much total capacity has been assigned to 5G (in MHz).
4. Subject to comments from ITU-R and EGTI Members by 15 October 2021;
5. The new indicators will be collected in the ITU WTI Long Questionnaire 2022;
6. extend the mandate of the 5G sub-group with the aim to investigate the implications for M2M (Machine-to-Machine) subscriptions.

BR and BDT are working jointly on how to process and deliver the relevant indicators on this matter.

#### 8.4.1.4 Spectrum Management Training Programme (SMTP)

Since 2013, the BR has actively participated in a joint project with the BDT to develop the Spectrum Management Training Programme (SMTP) through its different phases: design, material preparation, peer review, pilot test. Several updates occurred over the years and BR performed regularly a review of the material contained in the current SMTP. Recent updates were performed to include the outcomes from WRC-19/RA-19.

### Considering the resources necessary to maintain/update this tool and the importance of it for many administrations, a discussion is currently taking place in BDT to verify if SMTP could be further enhanced or migrated to a different tool.

### 8.4.2 ITU Telecom

The BR supported the ITU Telecom team in the organization of the (virtual) ITU Digital World 2021 and moderated panel sessions on

* “Managing growth, managing spectrum: best practices in spectrum harmonization”
* “Space for change: satellites in the service of digital transformation”
* “5G: fuelling digital transformation today – or tomorrow?”

and a Ministerial Round Table on “Boosting infrastructure: rethinking the role of government in digital transformation”.

## 8.5 Membership

### 8.5.1 ITU Membership

Tables 8.5.1-1 to 8.5.1-3 show the Membership by Sector and Region, along with the associated contributions in 2021 and the evolution of the number of ITU-R Sector Members, Associates and Academia during the period 2017 to 2021.

Table 8.5.1-1



Table 8.5.1-2



Table 8.5.1-3



### 8.5.2 ITU-R Membership

Table 8.5.2 shows the evolution of the number of ITU-R Sector Members, Associates, and Academia during the period 2017 to 2021.

Table 8.5.2

Evolution of the ITU-R membership since 2017

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **20**2017**172017** | **20**2018**82018** | **202**2019**01919** | **2**2020**2020** | **2**2021**021** | **2020 vs 2017** | **% Increase** |
| Sector member **Members** | 266  | 264  | 272  | 275 | 278 | 12 | 4.5%  |
| Associate | 21  | 20  | 21 | 22 | 28 | 7 | 33.3%  |
| **Academia\*** | 119 | 147  | 156  | 161 | 161 | 42  | 35.2%  |

|  |
| --- |
| *\*As per PP-14 decision, Academia membership encompasses all 3 ITU sectors* |

## 8.6 Communication and promotion

### 8.6.1 Website

The BR completed the enhancements, updates, and translations of the [ITU-R website](http://www.itu.int/en/ITU-R) menus, in accordance with the guidelines for the harmonization of sectoral web menus. This was presented during the Council Working Group CWG-LANG at its meeting held on 5 February 2021.

Table 8.6-1 below shows the current status of the translation of all level-0-and-1 webpages of the [ITU‑R website](http://www.itu.int/en/ITU-R) and their availability in the six ITU official languages. The figures in this table refer to the number of landing pages in the various departments of the BR (level 0) and the number of pages that are then accessible via one click only (level 1).

Table 8.6.1-1

ITU-R web pages languages statistics

|  |  |
| --- | --- |
|  | Status of ITU-R web pages translations for levels 0+1(as of Q1/2022) |
| **E** | **F** | **S** | **A** | **C** | **R** |
| SSD | Space | 33 | 20 | 20 | 7 | 7 | 7 |
| TSD | Terrestrial | 21 | 12 | 12 | 12 | 12 | 12 |
| SGD | Study Groups | 32 | 16 | 16 | 14 | 14 | 14 |
| Conf. | Conferences/Meetings/Seminars/Workshops | 14 | 11 | 12 | 7 | 7 | 7 |
| Others | Information/Promotion/Events | 16 | 13 | 12 | 11 | 11 | 11 |
| ITU-R website (total) | 116 | 72(62%) | 72(62%) | 51(44%) | 51(44%) | 51(44%) |

### 8.6.2 Promotion and media relations

In 2021, the primary focus of BR’s communications was related to BR's virtual meetings and webinars and promoting the work of the Bureau online and through social media.

The Radiocommunication Bureau organized three Satellite webinars between September and November 2021. The webinars attracted a record 5,476 participants from 135 countries. The webinars provided participants with an opportunity to be updated with the current technical and regulatory situation, evolution, and trends in the satellite industry.

The Radiocommunication Bureau has compiled the ‘[Best of WRS-20](https://www.itu.int/bestofwrs/)’ which is a collection of the videos and presentations made during the seminar. They include presentations on the application of the provisions of the Radio Regulations, the results of the 2019 World Radiocommunication Conference, the activities of the Terrestrial and Space Services departments, the work of the various ITU-R Study Groups, and current trends in various radiocommunication services.

During 2021, the Radiocommunication Bureau issued 7 Press Releases and Members Communiqués.

The 1st ITU Inter-regional Workshop on WRC-23 Preparation had more than 620 participants including 448 participants from 70 Member States, 126 Sector Members, and representatives from international organizations, telecommunications industry, associations, and academia. The virtual RRS-21 for Africa drew more than 270 participants from 54 countries, including 42 countries in ITU's Africa Region, The RRS for Asia-Pacific attracted 370 participants from more than 40 countries, while the virtual RRS-21 for the Americas attracted 300 participants representing 37 countries, including 28 countries from Latin America and the Caribbean.

The Bureau also participated actively in several United Nations International Days which are directly related to the work of BR. These include World Radio Day, International Day of Women and Girls in Science, International Women’s Day, World Meteorological Day, International Day of Human Space flight, World Telecommunication and Information Society Day, World Oceans Day, World Maritime Day, World Space Week, World Television Day, World Standards Day and International Civil Aviation Day. The BR communications team, in close collaboration with focal points, drafted articles and blogs which were published by ITUNews and UN News.

#### 8.6.2.1 FAQs, Media Backgrounders & ITU News

The following Frequently Asked Questions (FAQs), Backgrounders for the media, articles and ITU News magazines, and other resources continued to be developed or maintained during 2021.

FAQs:

* [ITU-R FAQ on Universal Time Scale (UTC) – Leap Second](https://www.itu.int/en/ITU-R/Documents/ITU-R-FAQ-UTC.pdf)
* [ITU-R FAQ on International Mobile Telecommunications (IMT)](https://www.itu.int/en/ITU-R/Documents/ITU-R-FAQ-IMT.pdf)
* [ITU-R FAQ on the Digital Dividend and the Digital Switchover (DSO)](https://www.itu.int/en/ITU-R/Documents/ITU-R-FAQ-DD-DSO.pdf)
* [ITU-R FAQ on Radio Regulations](https://www.itu.int/en/ITU-R/terrestrial/Pages/by-categories-faq.aspx?maincategorizedby=1)

Backgrounders for the media and the general public:

* Terrestrial Issues:
	+ [5G - Fifth Generation of Mobile Technologies (IMT-2020 and beyond)](https://www.itu.int/en/mediacentre/backgrounders/Pages/5G-fifth-generation-of-mobile-technologies.aspx)
	+ [5G, human exposure to electromagnetic fields (EMF) and health](https://www.itu.int/en/mediacentre/backgrounders/Pages/5G-EMF-health.aspx)
	+ [High-Altitude Platform Systems (HAPS)](https://www.itu.int/en/mediacentre/backgrounders/Pages/High-altitude-platform-systems.aspx)
	+ [Radiocommunications for keeping ships and people safe at sea](https://www.itu.int/en/mediacentre/backgrounders/Pages/Radiocommunications-for-keeping-ships-and-people-safe-at-sea.aspx)
* [ITU Study Groups](https://www.itu.int/en/mediacentre/backgrounders/Pages/itu-study-groups.aspx)
* [ITU-R: Managing the radio-frequency spectrum for the world](https://www.itu.int/en/mediacentre/backgrounders/Pages/itu-r-managing-the-radio-frequency-spectrum-for-the-world.aspx)
* Satellite issues:
	+ [Earth stations in motion (ESIM)](https://www.itu.int/en/mediacentre/backgrounders/Pages/Earth-stations-in-motion-satellite-issues.aspx)
	+ [Non-GSO satellite systems](https://www.itu.int/en/mediacentre/backgrounders/Pages/Non-geostationary-satellite-systems.aspx)
	+ [Non-GSO satellite systems with short duration missions](https://www.itu.int/en/mediacentre/backgrounders/Pages/non-GSO-satellite-systems-with-short-duration-missions.aspx)

MyITU

In 2021, the Radiocommunication Bureau published two Special editions of the ITU Magazine. These were

* World Radio Day 2021 ['New World, New Radio'](https://www.itu.int/hub/publication/s-gen-news-2021-1/)
* [Women leading in radiocommunications and space](https://www.itu.int/hub/publication/s-gen-news-2021-2/)

The Director of the Radiocommunication Bureau was a regular contributor to ITUNews articles, blogs and Podcasts. The following were published under his name:

* [Celebrating the resilience of radio](https://www.itu.int/hub/2021/02/celebrating-the-resilience-of-radio/)
* [New World, New Radio: Celebrating the Resilience of the World’s Most Widely Used Medium](https://www.un.org/en/un-chronicle/new-world-new-radio-celebrating-resilience-world%E2%80%99s-most-widely-used-medium)
* World Radio Day 2021 Podcast-[Technology for Good: The resilience of radio](https://soundcloud.com/ituproduction/technology-for-good-8-the-resilience-of-radio)
* [World Maritime Day: Keeping seafarers safe and connected](https://www.itu.int/hub/2021/09/world-maritime-day-keeping-seafarers-safe-and-connected/)
* Why we need technical standards to manage radio-frequency spectrum efficiently
* [Why we need technical standards to manage radio-frequency spectrum efficiently](https://www.itu.int/hub/2021/10/why-we-need-technical-standards-to-manage-radio-frequency-spectrum-efficiently/)

The Bureau has also been encouraging senior BR staff members to contribute articles, blogs to ITUNews to highlight the work being done by the Bureau. There has also been a steady flow of articles from ITU-R Sector Members.

The following articles were published in 2021.

* [Beyond 5G: What’s next for IMT?](https://www.itu.int/hub/2021/02/beyond-5g-whats-next-for-imt/)
* [What do space science radiocommunications have to do with me?](https://www.itu.int/hub/2021/02/what-do-space-science-radiocommunications-have-to-do-with-me/)
* [Radio’s key role in crisis and emergency situations](https://www.itu.int/hub/2021/02/radios-key-role-in-crisis-and-emergency-situations/)
* [Be so good they can’t ignore you: Women and girls in STEM](https://www.itu.int/hub/2021/03/be-so-good-they-cant-ignore-you-women-and-girls-in-stem/)
* [Radio Regulations: Key to observing oceans, climate, and weather](https://www.itu.int/hub/2021/03/radio-regulations-key-to-observing-oceans-climate-and-weather/)
* [Monitoring the atmosphere, ocean and climate from space](https://www.itu.int/hub/2021/03/monitoring-the-atmosphere-ocean-and-climate-from-space/)
* [Home but never alone: Celebrating World Amateur Radio Day](https://www.itu.int/hub/2021/04/home-but-never-alone-celebrating-world-amateur-radio-day/)
* [Why media matters: Images of women scientists and engineers](https://www.itu.int/hub/2021/04/why-media-matters-images-of-women-scientists-and-engineers/)
* Podcast: ITU Technologized: [Interview with Robyn Gatens, Director, International Space Station, NASA](https://soundcloud.com/ituproduction/itu-technologized-interview-with-robyn-gatens-director-international-space-station-nasa/s-pbh0D2H6g2c)
* [Envisioning a low-Earth orbit economy](https://www.itu.int/hub/2021/04/envisioning-a-low-earth-orbit-economy/)
* [The benefits of space must be accessible to all](https://www.itu.int/hub/2021/05/the-benefits-of-space-must-be-accessible-to-all/)
* [Should space become the 18th SDG?](https://www.itu.int/hub/2021/06/should-space-become-the-18th-sdg/)
* [Boosting diversity in the aerospace industry](https://www.itu.int/hub/2021/06/boosting-diversity-in-the-aerospace-industry/)
* [Satellites to connect the unconnected](https://www.itu.int/hub/2021/06/satellites-to-connect-the-unconnected/)
* [“Scully effect” entices women and girls into STEM careers](https://www.itu.int/hub/2021/09/scully-effect-entices-women-and-girls-into-stem-careers/)
* [Reliable space services: Why and how?](https://www.itu.int/hub/2021/10/reliable-space-services-why-and-how/)
* [Aspiring astrobiologist aims for Mars](https://www.itu.int/hub/2021/10/aspiring-astrobiologist-aims-for-mars/)
* [Managing radio frequency spectrum amid a new space race](https://www.itu.int/hub/2021/11/managing-radio-frequency-spectrum-amid-a-new-space-race/)
* [Behind the latest Olympics broadcasts: TV tech brings the world together](https://www.itu.int/hub/2021/11/behind-the-latest-olympics-broadcasts-tv-tech-brings-the-world-together/)

Other resources created, maintained and updated during this period are:

* [Free online access to ITU-R Publications, Software and Databases](http://www.itu.int/oth/R040200003F/en)
* [Artificial Intelligence (AI) making radiocommunications smarter](https://www.itu.int/en/action/ai/emerging-radio-technologies/Pages/default.aspx)
* [ITU global standard for international mobile telecommunications ´IMT for 2020 and beyond´](https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/imt-2020/Pages/default.aspx)
* [Radiocommunications and Climate Change](https://www.itu.int/en/ITU-R/information/Pages/climate-change.aspx)
* [Emergency Radiocommunications](https://www.itu.int/en/ITU-R/information/Pages/emergency.aspx)
* [ITU-R Sector contribution to Bridging the Digital Disabilities Divide](https://www.itu.int/ITU-R/go/disabilities-divide/en)

#### 8.6.2.2 Branding communications, Sales and Marketing

The branding and communication activities carried out during 2021 centred around using the new MyITU platform in collaboration with Sales and Marketing to promote the following ITU-R Publications:

* [Final Acts of WRC-19 - My ITU](https://www.itu.int/en/myitu/Publications/2020/06/25/16/38/Final-Acts-of-WRC-19)
* [Radio Regulations 2020 - My ITU](https://www.itu.int/en/myitu/Publications/2020/09/02/14/23/Radio-Regulations-2020)
* [Maritime Manual 2020 - My ITU](https://www.itu.int/en/myitu/Publications/2020/09/02/14/28/Maritime-Manual-2020)
* [The RR5 Software - My ITU](https://www.itu.int/en/myitu/Publications/2020/10/30/17/09/The-RR5-Table-of-Frequency-Allocations-software)
* [List V - List of Ship Stations and Maritime Mobile Service Identity Assignments 2021 - My ITU](https://www.itu.int/hub/publication/r-sp-lm-v-2021/)
* [List IV – List of Coast Stations and Special Service Stations 2021](https://www.itu.int/hub/publication/r-sp-lm-iv-2021/)
* [The ITU Radio Regulations Navigation Tool](https://www.itu.int/hub/publication/r-reg-rrx-2021/)
* [The Radio regulations Rules of Procedure](https://www.itu.int/hub/publication/r-reg-rop-2021/)

#### 8.6.2.3 Exhibitions and demos

Due to the global health crisis and resulting global travel restrictions, there were no exhibitions and demos organized during this period.

#### 8.7 Gender Equity

Promoting gender equality in all spheres of today’s digital society has never been more crucial as the world embarks on the Decade of Action to achieve the 2030 Agenda for Sustainable Development. Digital technologies are crucial to the attainment of all the 17 Sustainable Development Goals and increasing the share of women with access to and using digital technologies to better their lives - and by extension improve the lives of their families and society is a development challenge we all have a stake in.

The following activities were progressed in 2021:

### 8.7.1 RAG Correspondence Group on Gender

The activities of the RAG Correspondence Group on Gender (RAG CG-Gender) are described in their separate report to the 2021 RAG meeting.

### 8.7.2 Network of Women for WRC-23 (#NOW4WRC23)

Prior to the WRC-19, the ITU Network of Women for WRC-19 was launched, which is dedicated to promoting women in radiocommunications, telecommunications/ICT and related fields to help meet UN Sustainable Development Goal 5 on achieving gender equity. This initiative aimed to start building capacity and to encourage larger participation of women in key roles, to attend our meetings and conferences as delegates, chairs, and vice-chairs, for example, and to work towards achieving the 30 per cent threshold necessary for any real change. Additionally, it aims to encourage greater gender inclusion, to ensure women delegates play key roles for future radiocommunications conferences and events, and to grow the ITU women's community, capacity, and contribution.

The **Network of Women for WRC-23,** which had its [kick-off meeting](https://www.itu.int/en/mediacentre/Pages/cm08-2020-Radiocommunication-Sector-gender-equality-equity-parity.aspx) alongside the 2020 World Radiocommunication Seminar (WRS-20), has been active at both the global and regional levels. At the global level, the NOW4WRC23 has established a mentoring program that matches mentors and mentees who are participating in the work of the ITU-R and who have common areas of interest. At the regional level, the NOW4WRC23 initiative is led by Regional NOW4WRC23 CoChairs who carry out regional mentoring programs and workshops in conjunction with the meetings of their associated Regional Telecommunication Organizations. The Regional NOW4WRC23 CoChairs and Representatives are:

* APT- Ms. Zhu Keer (China);
* ASMG-Asma Al Mheiri (UAE) and Zeina Mokaddem (Inmarsat);
* ATU-Aminata Niang Diagne (Senegal) ;
* CEPT-Amela Hatibovic-Sehic (Sweden);
* CITEL-Jennifer Manner (USA); and
* RCC – Ms. Aizhan Tiyanak (Kazakhstan).

The NOW4WRC23 held an information session during the 1st InterRegional Workshop on WRC-23 Preparations that was held on 13-15 December 2021. The NOW4WRC23 presentation to the 1st IRW can be found [here](https://www.itu.int/dms_pub/itu-r/md/19/wshwrc23/c/R19-WSHWRC23-C-0005%21%21PDF-E.pdf). At that time, the top 3 priorities of NOW4WRC23 were:

* More leadership opportunities for women
	+ Promoting more chairmanships and other leadership roles for women in the preparatory groups at all levels
	+ Preparing for nomination to WRC Chairmanship positions
* The need for more mentors for the programme
	+ Call for mentors
* Impact of the return to physical meetings
	+ Ensuring Women/Mentees' continuous participation and involvement.

 The RAG CG-Gender also supports and provides input to the ongoing work of the NOW4WRC23 to enhance and maximize the effectiveness of this initiative.

**9 Remaining 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)), in addition to what has been reported in the sections above, BR has implemented the following actions:

**9.1**  **Request of Council Working Group on Languages (CWG-LANG) for RAG review and update of document C14/INF/4**

Under agenda item 3 of CA/256, concerning the requested review and update to C14/INF/4, the RAG had endorsed the proposed update that was provided in the Annex to RAG21/26 and also endorsed the addition of a line for “Webpages”, as shown in Annex 1 to CA/256 to be added to the table to reflect what is now the standard practice across the sectors. This decision of the RAG was incorporated in [C22/INF/7](https://www.itu.int/md/S22-CL-INF-0007/en), which was endorsed by the Council Working Group on Languages at its most recent meeting on18 January 2022.

**9.2 Other actions carried out by the BR Study Groups Department**

The other actions requested by the RAG at its 2021 meeting were carried out by the BR SGD and are presented in Section 9 of Addendum 1 to this document.

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