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| **Radiocommunication Advisory Group Geneva, 26-29 March 2018** |  | |
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|  | | **Document RAG18/1-E** |
| **13 February 2018** |
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| Director, Radiocommunication Bureau | | |
| REPORT TO THE TWENTY-FIFTH MEETING OF THE RADIOCOMMUNICATION ADVISORY GROUP | | |

# 1 Introduction

This document provides status reports and background information on some of the issues that appear on the draft agenda for the 25th meeting of RAG (see CA/236 of 30.10.2017). 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

This section covers and updates the issues addressed by the 2017 session of the Council (see: <https://www.itu.int/en/council/2017/Pages/default.aspx>).

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

The free online access policy continues to provide a very large dissemination of ITU standards to a broader public, especially in developing countries with financial and technical constraints. This wide outreach via free online access is helping to build the visibility of ITU’s mission and mandate and reinforce ITU as a global telecommunication authority.

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, to ITU‑R, ITU‑T and ITU‑D Recommendations and Reports; ITU‑R handbooks on radio-frequency spectrum management[[1]](#footnote-1); ITU publications concerning the use of telecommunications/ICTs for ensuring disaster preparedness, early warning, rescue, mitigation, relief and response; the International Telecommunication Regulations (ITRs); the Radio Regulations; the Rules of Procedure; the basic texts of the Union (Constitution, Convention, General Rules of conferences, assemblies and meetings of the Union, decisions, resolutions and Recommendations); the final acts of plenipotentiary conferences; the final reports of WTDCs; the ITU Council resolutions and decisions; the final acts of world and regional radiocommunication conferences; and the final acts of world conferences on international telecommunications.

Additionally, in response to requests from state members, 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 shown in Section 8.1.4.

## 2.2 Cost recovery for satellite network filings

The application by the Radiocommunication Bureau of Decision 482 (modified 2013) and Decision 482 (modified 2017) has not given rise to any administrative or operational difficulty either internally or with administrations notifying satellite networks.

At its 2017 session, the Council instructed the Radiocommunication Bureau to submit a study on the technical issues arising in connection with processing of complex non-geostationary satellite (non-GSO) systems. In particular, it was requested to study whether there is a possibility for the individual non-GSO filings (API/coordination/notification) containing non-homogeneous satellite orbits with differing altitudes and inclinations, and/or different constellation configurations, to be separated into filings containing each individual constellation or individual types of satellite orbit, for the purposes of processing by the Bureau.

In response to the abovementioned Council 2017 decision, the Radiocommunication Bureau prepared a study addressing the technical issues arising in connection with processing of complex non-GSO satellite network filing systems to clarify technical issues such as but not limited to procedures in particular, elements required for processing of non-geostationary satellite (non-GSO) networks in addition to those for GSO network. This study was submitted to the Radio Regulations Board and to relevant ITU-R Working Parties for their consideration and comments. Based on these comments, the Bureau submitted a [document](https://www.itu.int/md/S18-CLCWGFHRM8-C-0020/en) to the Council Working Group on Financial and Human Resources as well as to the Radio Regulations Board, ITU-R Working Parties and the RAG (see Addendum 2 to this Report), which proposes three possible specific procedures for cost recovery of non-GSO satellite systems. As requested by Council 2017, these proposals have been submitted to Council 2018 on 1st February 2018 (see [Document C18/36](https://www.itu.int/md/S18-CL-C-0036/en)).

## 2.3 Processing of satellite filings

Taking into account of discussions held during the 24th meeting of the RAG, Council 2017 instructed the BR Director “to take urgent measures to restore staffing levels in the BR (especially in the Space Services Department and in the unit responsible for software development) to the level needed for BR to carry out its mandate in full” and “to adopt measures to eliminate delays in the processing of frequency assignment filings”. When approving the budget for 2018-2019, Council 2017 decided to allocate the necessary funding for three additional radiocommunication engineers. The recruitment process has started with the publication of the three positions. The call for candidatures ends on 22 February 2018. In the meantime, improvements in some examination software should also contribute to reducing the current delays in processing satellite filings.

## 2.4 Conformance and interoperability (C&I)

Resolution 177 (Rev. Busan, 2014) endorsed the objectives of WTSA-12 Resolution 76, RA-12 Resolution 62, WTDC-14 Resolution 47, recognizing that “widespread conformance and interoperability of telecommunication/ ICT equipment and systems through the implementation of relevant programmes, policies and decisions can increase market opportunities and reliability and encourage global integration and trade”, and resolved to continue implementing the ITU C&I Action Plan reviewed by the ITU Council.

The ITU C&I programme mandated by Resolution 177 (Rev. Busan, 2014) is still based on four pillars: Pillar 1: Conformity assessment (CA); Pillar 2: Interoperability events; Pillar 3: Human resource capacity building; and Pillar 4: Assistance in the establishment of test centers and C&I programmes in developing countries.

Actions under Pillars 1 and 2 are led by the Telecommunication Standardization Bureau (TSB), actions under Pillars 3 and 4 by the Telecommunication Development Bureau (BDT). ITU‑R continues to collaborate with, and provide information when requested by, ITU‑T and ITU‑D on C&I testing, as indicated in the resolves section of Resolution ITU‑R 62. There have been no inputs to the ITU-R Study Groups on this topic since the last RAG.

## 2.5 Space Protocol

At its 2017 session, the Council considered again the topic of the ITU's role as supervisory authority of the international registration system for space assets under the space protocol. During the consideration, it was recalled that the acceptance by ITU of the role of supervisory authority would have to be formalized through an agreement between UNIDROIT and ITU.

The Chairman of the Council noted from the discussions on this topic the absence of objections of principle to ITU becoming the Supervisory Authority and the general agreement that the final decision should be taken by the ITU Plenipotentiary Conference (PP-18), which will be held in Dubai (UAE) from 29th October to 16th November 2018.

Notwithstanding this absence of objection, the Council endorsed a set of conditions for recommendation to PP-18, should it decide that ITU will assume the role of Supervisory Authority. These conditions are set out in §§ 4 to 13 of [Document C17/36(Rev.1)](https://www.itu.int/md/S17-CL-C-0036/en). Moreover, the Council authorized the ITU Secretary-General (or his representative) to continue to participate in the work of the Preparatory Commission and its working groups.

## On 6th December 2017, the ITU Legal Advisor and the Chief of the Space Services Department of the Radiocommunication Bureau represented the ITU Secretary-General at the 5th meeting of the UNIDROIT Preparatory Commission for the establishment of the international registry for space assets pursuant to the Space Protocol. They reported to the Preparatory Commission the conclusions of the 2017 session of the Council related to the appointment of ITU as Supervisory Authority in the Space Protocol. The Preparatory Commission welcomed this development. The ITU Legal Advisor and the BR are preparing the necessary documentation for PP-18. UNIDROIT offered its help in developing information material in order for delegations attending PP-18 to be better informed about the Space Protocol.

## 2.6 Budget for 2018-2019 period

Council 2017 adopted the following budget for the ITU-R in the 2018-2019 timeframe.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Budget 2018-2019 - Radiocommunication Sector** | | | | | | | |
|  |  | **In thousands of Swiss francs** | | | | | |
| **Operating expenses by section** | | **Actual** | **Budget** | **Actual** | **Estimates** | **Estimates** | **Estimates** |
|  |  | **2014-2015** | **2016-2017** | **2016 \*** | **2018** | **2019** | **2018-2019** |
|  |  |  |  |  |  |  |  |
| Section 3.1 | World radiocommunication conferences | 2,167 | 0 | 0 | 0 | 2,638 | **2,638** |
|  |  |  |  |  |  |  |  |
| Section 3.2 | Radiocommunication assemblies | 211 | 0 | 0 | 0 | 335 | **335** |
|  |  |  |  |  |  |  |  |
| Section 4.1 | Regional radiocommunication conferences | 0 | 0 | 0 | 0 | 0 | **0** |
|  |  |  |  |  |  |  |  |
| Section 5.1 | Radio Regulations Board | 904 | 1,410 | 373 | 406 | 405 | **811** |
|  |  |  |  |  |  |  |  |
| Section 5.2 | Radiocommunication Advisory Group | 85 | 149 | 36 | 53 | 53 | **106** |
|  |  |  |  |  |  |  |  |
| Section 6 | Study groups | 1,114 | 1,470 | 164 | 585 | 892 | **1,477** |
|  |  |  |  |  |  |  |  |
| Section 7 | Activities and programmes | 514 | 1,200 | 300 | 595 | 605 | **1,200** |
|  |  |  |  |  |  |  |  |
| Section 8 | Seminars | 278 | 876 | 263 | 390 | 390 | **780** |
|  |  |  |  |  |  |  |  |
| Section 9 | Bureau | 50,627 | 52,396 | 25,393 | 25,959 | 26,280 | **52,239** |
|  | - Common expenditure | 1,227 | 1,792 | 201 | 1,035 | 1,035 | **2,070** |
|  | - Office of the Director | 1,292 | 1,309 | 721 | 773 | 776 | **1,549** |
|  | - Study Groups Department | 5,754 | 5,684 | 2,966 | 2,675 | 2,767 | **5,442** |
|  | - Space Services Department | 16,502 | 16,049 | 8,510 | 8,408 | 8,458 | **16,866** |
|  | - Terrestrial Services Department | 12,272 | 12,520 | 6,033 | 5,771 | 5,883 | **11,654** |
|  | - Informatics, Administration & Publications Department | 13,580 | 15,042 | 6,962 | 7,297 | 7,361 | **14,658** |
|  |  |  |  |  |  |  |  |
| **TOTAL** |  | **55,900** | **57,501** | **26,529** | **27,988** | **31,598** | **59,586** |
| \* At 17 February 2017 | |  |  |  |  |  |  |

## 2.7 RA/WRC-19 venue

During its 2017 session, the Council adopted a revision to Resolution 1380 which resolves to convene the next World Radiocommunication Conference (WRC-19) and the Radiocommunication Assembly (RA-19) in Sharm el-Sheikh (Egypt), without changing the dates of these events and the agenda of WRC-19 previously agreed by Council and confirmed by a consultation of the Member States.

Resolution 1380 (modified 2017) instructs the Secretary General to consult the Member States on the precise place of the 2019 World Radiocommunication Conference and Radiocommunication Assembly. Therefore, and in accordance with CV 42 and CV 118, a consultation of the Member States was carried out through Circular letters CL-17/34 of 18 July 2017 and CL-17-39 of 13 September 2017.

As informed to the membership via Circular Letter CL-17-52 of 18 December 2017, the precise place of the WRC-19 and the precise place of the RA-19 as set forth in Resolution 1380 (modified 2017) received the agreement of the required majority of the Member States of ITU, in accordance with No. 47 of the ITU Convention.

As a result, the WRC-19 and the RA-19 will take place in Sharm el-Sheikh (Egypt), without changing the dates and the agenda of WRC-19 previously agreed by the Council and confirmed by a consultation of Member States.

A site visit to the proposed venue was carried out by BR and Secretary General staff in January 2018. During the visit, special attention was given to the three main aspects that are considered key for a successful conference: Logistics (with emphasis on the size and number of available meeting rooms and interpretation facilities), IT facilities (with emphasis on ICT and audio-visual capabilities), and Safety and Security.

Although the Maritim Sharm el-Sheikh International Congress Centre in its current configuration doesn’t have the required facilities to hold the RA/WRC-19, an extension to the congress centre is being built, which will increase considerably the capacity and facilities of the existing venue, both in terms of meeting rooms as well as ICT and audio-visual facilities. This extension is scheduled to be delivered by August 2018, more than one year before the holding of RA/WRC-19. Moreover, the host country reiterated its commitment to cater for all the facilities required for the smooth running of the conference.

# 3 Implementation of WRC-15 decisions

## 3.1 Software development to implement WRC-15 decisions

During 2017, the Bureau pursued software design and development to implement WRC-15 decisions. The table below presents a summary of the main tasks under consideration.

**Software development activities to implement WRC-15 decisions**

|  |
| --- |
| **Resolution 907 (Rev. WRC-15): Use of modern electronic means of communication for satellite network –related administrative correspondence**  Following WRC-15, a project to address the definition, design and implementation of the toolset to cover the implementation of Resolution **907 (WRC-15)** was initiated under the coordination of the Space Services Department.  The following goals were set in order to define a secure online system to modernize and enhance the current system processing correspondence to and between Administrations with ITU:   * Simple, intuitive user interface to address a worldwide community of ITU member administrations and ensure the maximum possible acceptance * Web-based and self-contained online system hosted in ITU IT infrastructure, relaying online submissions of correspondence to a destination (ITU, Administrations) * High security and trust in relaying, timestamping, forwarding correspondence while monitoring the information flow * Ability to track submission and delivery, as well as successful reception of expedited data * Seamless integration into existing correspondence processing system and ITU IT infrastructure   The collection of functionality requirements was initiated during the project start up in order to collect information on the expectations of such a system. Between mid-2016 and mid-2017 a prototype tool was developed by ITU Academia member CTU Prague, Czech Republic. This tool was used to make a technological demonstration of the basic functionality and steer the choices for the future project evolution.  In October 2017, CTU Prague handed off the prototype to BR staff for further internal development. The production version of the Resolution 907 project will combine the best features of the development done for Resolution 908 and Resolution 186, together with the specific security enhancements provided by CTU Prague, with the following project phases:   * September 1, 2018: External test of beta version of Phase 1, allowing for communications between the BR and administrations; * January 1, 2019: Phase 1 in production; * March 1, 2019: External test of beta version of Phase 2, allowing for communications among administrations; * June 1, 2019: Phase 2 in production |
| **Resolution 908 (Rev.WRC-15): Electronic submission of satellite network filings**  Resolution **908 (Rev.WRC-15)** resolves that administrations shall submit all satellite network filings and comments, if required, using a secure paperless electronic approach upon being advised that the means for such electronic submission of a satellite network filing for satellite networks or systems has been implemented and upon receiving assurances that such means are indeed secure.  As reported to RAG in 2017, the Bureau is developing a consolidated approach for the electronic submission, processing and publication of all satellite network notices and comments. To assist in the RES-908 development and testing, the Administration of Japan has made a financial contribution to the Resolution 908 project and made available a space regulatory/technical expert in Geneva for a period of 2 years.  The following outputs under Resolution **908 (Rev.WRC-15)** are foreseen:  1. A consolidated approach for the electronic submission and publication of all satellite network filings, related comments and publication.  2. An improved internal BR processing system for the treatment of satellite network filings and comments.  3. Streamlined internal BR processes for the treatment of satellite network notices.  4. Integration between new versions of legacy software applications (please refer to the BR Space Information Systems roadmap in Annex 1) and the modern web based technology chosen for the implementation of Resolution 908.  The tentative release schedule of the e-submissions portal for Phase 1 of the Resolution 908 project concerning the submission of satellite filings and comments is as follows:   * February 15 – end of April 2018: External beta testing * May – mid-June 2018: Corrections and improvements based on feedback from external beta testing * June 15 – end of July 2018: Use in production on a voluntary basis: administrations would still be able to submit filings through the combination of fax letters and e-mail attachments * August 1, 2018: Use in production on a mandatory basis (conditional on the adoption of the corresponding revised Rule of Procedure by the RRB)   The improvements in internal processes and processing software will be implemented concurrently with the above externally visible functionality. This work will continue into 2019, in conjunction with the work planned according to the BR Space Information Systems roadmap (SNS Online, SNTrack, etc.). |
| **Implementation of WRC-15 decisions relating to space services**  The implementation of WRC-15 decisions continued in 2017, with the refinement and improvement of administrative and technical examination software.  **Implementation of Resolution 55 (WRC-15)**  In accordance with the changes to Resolution **55 (WRC-15)** where the requirement for “as-received” is revised such that the notices are to be made available only the BR website, and to satisfy the request from Administrations concerning the changes to the advance publication procedure where the request for coordination is now the first step of submission for a satellite network subject to coordination, the Bureau has implemented an all new “as-received” webpage <https://www.itu.int/net4/itu-r/res55asreceived/>, available since the beginning of 2017. All notices received by the administrations are now available for download on the website along with a summary of the network. For request for coordination, a list of unique frequency bands is contained in the summary. All these functionalities, including the internal processing functions within BR, were implemented as part of the Resolution 908 project.  **Implementation of API/C – advance publication information for satellite networks subject to coordination**  In accordance with Nos. **9.1A** and **9.2C**, the Bureau has implemented a system (within the overall project of Resolution 908) to extract the API basic characteristics, extracted from the requests for coordination received under No. **9.30**, and publish them in a new "API/C" Special Section, available freely for download on the ITU website. |

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| **Implementation of WRC-15 decisions relating to terrestrial services**  Continuous update of all terrestrial services processing software, both for internal (*TerRaSys*) and external (BR IFIC (Terrestrial)) use, including improved database schemas and updated validation and examination software modules, matching the changes in Appendix **4** notified data elements, for the submission of terrestrial frequency notifications, as a consequence of WRC-15 and RRB decisions.  Updated versions of the reference databases and associated software modules needed for the technical and regulatory examinations by the BR of terrestrial frequency assignments in the bands shared between terrestrial and space services, taking into account WRC-15 and RRB decisions. This also includes reference data for Common frequency bands.  Continued development of the software modules, reference databases and associated tools for terrestrial services, aiming to automate the processing of:   * the needs and requests for coordination under RR No. **9.21**, taking into account WRC-15 and RRB decisions. The protection criteria under RoP B5 are entirely implemented and tested. As for RoP B6, parts relying on ITU-R P.1546 have been implemented and tested. The integration with TerRaSys processing is ongoing. * submissions that are not receivable under No. **11.14**. |

### 3.2 Other actions to implement WRC-15 decisions

The Bureau developed drafts for new or modified Rules of Procedure in order to reflect the WRC‑15 decisions. These drafts were considered by the RRB together with comments received from administrations and the corresponding Rules of Procedure were approved by the RRB at its 75th and 76th meetings (July and November 2017).

The Bureau completed the review of 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-15 decisions entered into force on 1 January 2017. For the same reason, the Bureau also converted existing analog assignments in the Regions 1 and 3 Plan and List of Appendices 30 and 30A into digital ones.

The Bureau developed new and/or updated versions of all terrestrial services processing software, both for internal (TerRaSys) and external (BR IFIC (Terrestrial)) use, including improved database schemas and updated validation and examination software modules, matching the changes in Appendix 4 notified data elements, for the submission of terrestrial frequency notifications, as a consequence of WRC-15 and RRB decisions.

In accordance with *resolves* 2 of Resolution **31 (WRC-15)**, the Bureau suppressed all advance publication information related to a satellite network or system subject to the coordination procedures in Section II of Article 9 for which a coordination request has not been received before 31 December 2016. This action resulted in more than 2 500 suppressions.

Since the 1st of January 2018, comments on Part A of AP30/E or AP30A/E Special Sections and on AP30-30A/F/C Special Sections related to Regions 1 and 3 are no longer required to be submitted using SpaceCom as a result of modification to the procedure for submitting comments applicable to Regions 1 and 3 in Appendices 30 and 30A. An updated version of the SpaceCom software has consequently been developed and made available.

# 4 Study Groups activities

This topic is presented in Addendum 1 to this document.

# 5 WRC-19 preparation

Based on the results of the first session of the Conference Preparatory Meeting for WRC-19 (CPM‑19) and taking into account the deadlines established for the preparation of the draft CPM Report to WRC-19 (see [BR Administrative Circular CA/226](http://www.itu.int/md/R00-CA-CIR-0226/en) of 23 December 2015 and its Addendum 1 of 19 September 2016, 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-19 agenda items and/or related WRC Resolutions, as well as on the studies in response to ITU-R Resolutions for the preparation of RA-19. Detailed information regarding the ITU‑R preparatory studies for WRC-19 can be found on the following updated ITU webpage: [www.itu.int/go/rcpm-wrc-19-studies](http://www.itu.int/go/rcpm-wrc-19-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-19 for its consideration during the second session of CPM-19 planned from 18 to 28 February 2019.

Taking into account Resolution 80 (Rev. Marrakesh, 2002), extensive preparations for WRC-19 have continued through Regional Telecommunication Organizations (RTOs) including CEPT, CITEL, APT, RCC, the Arab Group of countries and the African Group of countries through the ATU. The Radiocommunication Bureau has been assisting these preparations wherever possible, noting, in particular, Resolution 72 (Rev.WRC-07).

In order to start building consensus on the positions and proposals developed by the various Regional Telecommunication Organizations, the BR convened the [first ITU Inter-regional Workshop on WRC-19 Preparation](http://www.itu.int/go/ITU-R/wrc-19-irwsp-17) in Geneva on 21-22 November 2017. The workshop was attended by 253 participants representing 59 countries and 51 companies, organizations and academia, and including representatives from the above-mentioned RTOs (see details and additional statistics on the Member States participation in the [Workshop Document 31](https://www.itu.int/md/R15-WRC19PREPWORK-C-0031/en) and its Addendum 1). 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/R15-WRC19PREPWORK-C/en) are still available [online](http://www.itu.int/go/ITU-R/wrc-19-irwsp-17). The preliminary version of the [Conference Proposal Interface (CPI) for WRC-19](https://www.itu.int/net4/Proposals/CPI/WRC19/Main) was also presented during the Workshop. Two other ITU Inter-regional Workshops on WRC-19 Preparation are planned: one near the end of November 2018 (prior to CPM19-2) and a final one in early September 2019 (prior to WRC-19).

The ITU webpage for WRC-19 at: [www.itu.int/go/wrc-19](http://www.itu.int/go/wrc-19) has been updated and provides a direct access to the above-mentioned information.

# 6 Operational planning

As reported to the 24th meeting of the RAG, in accordance with the provisions in the approved strategic plan of the Union for 2016-2019 by PP-14, the ITU‑R Operational Plan has been structured based on a results-based management concept so as to ensure complete linkage with the budget and other financial tools of the Union. The ITU-R Operational plan for the period 2018-2021 was approved by Council-17.

The draft ITU‑R Operational Plan for the period 2019-2022 is presented in Addendum 3 to this document, for review and comments by RAG.

# 7 BR information system

RAG-19 (2012) advised the Director to implement recommended actions within the proposed time-frame, as described in the agreed roadmap, comprising: Phase 1 (Implementation of WRC 12 decisions) up to 31 December 2012; Phase 2 (Rewrite some existing software) up to 31 December 2015; and Phase 3 (Set up a project team to implement a common framework, security system and centralized space database) from 1 January 2016 to 31 December 2018. RAG encouraged Member States and Sector Members to submit their comments on Phase 3.

The progress report on this topic is presented in Annex 1 to this document. Other on-going developments are addressed hereafter.

## 7.1 Software developments related to space services

## 7.1.1 Implementation of Resolution 186 (Busan, 2014)

The BR has continued developing and revising the requirements for the implementation of a database and corresponding web application for submission and publication of harmful interference reports for space services (SIRRS). The system will be available for external testing by the end of the first quarter of 2018.

## 7.1.2 Integration of EPFD validation software

In its Circular Letter CR/414 (6 December 2016), the Bureau provided administrations and other users with information and guidance on the EPFD validation software and implementation of the *instructs the Director of the Radiocommunication Bureau* section of Resolution **85 (WRC-03)**.

In accordance with *instructs the Director of the Radiocommunication Bureau* 2 and 3 of Resolution **85 (WRC-03)**, the Bureau has been initiating the process of reviewing its findings under Nos. **9.35**, **11.31**, **9.7A** and **9.7B**. To this end, in March 2017, the Bureau contacted individually each administration having submitted non-geostationary satellite systems in the fixed-satellite service, including frequency assignments with qualified favourable findings in accordance with Resolution **85 (WRC-03)**, and has been requesting the PFD and e.i.r.p. mask data as well as the related missing Appendix 4 data elements.

Considering the absence of response from the notifying administration, the Bureau noted that some satellite filings were incomplete and the corresponding frequency assignments which were subject to Resolution **85 (WRC-03)** were therefore treated as non-receivable because the requested information was not received. The Bureau informed the notifying administrations of such non-GSO filings that the concerned assignments were not receivable and returned them.

The Bureau has started to publish the results of the EPFD examination together with PFD and e.i.r.p. masks and examination databases in BR IFIC 2862 (Space services). This information is also available on the following BR webpage: <https://www.itu.int/ITU-R/go/space-epfd-data>. As reported to the 76th meeting of the Radio Regulations Board, for satellite networks systems requiring long calculation time, the list of coordination requirements under No. **9.7B** will be published in two stages in order to avoid delaying the whole process.

For two satellite filings, the Bureau has received a request to continue to apply Resolution **85 (WRC-03)** while maintaining a qualified favourable finding. Following information on the constellations of these satellite systems provided by the notifying administration and based on the work carried out in ITU-R Working Party 4A, revised Recommendation ITU-R S.1503-3 was approved to provide more adequate modelling of the constellations covered in these specific filings. Once an updated version of the EPFD validation software implementing this version is available, the qualified favourable findings issued in accordance with Resolution **85 (WRC-03)** will be reviewed.

The Bureau has established maintenance contracts until July 2018 with the two software companies which developed the EPFD validation software packages. These contracts are required to identify and resolve difficulties caused by unexpected input data, debugging of the software for certain examination cases and introducing further improvements to the software. Under the first completed order, the following improvements were implemented:

1. Ensure consistency in the alpha / X calculation
2. Performance improvement (time step optimization, hardware optimization)
3. Have an option to select the run to execute (i.e. not run all of them)
4. Test the tool to run against SNS v8 database format and modify
5. Provide output of probability distribution function in results database.

The updated software was released in BR IFIC 2860 (12.12.2017).

Since the funds allocated in the maintenance contracts are very limited, the Bureau expects that these funds may run out soon while the Bureau progresses gradually with each examination case. Therefore, the Bureau is considering establishing long-term contracts to support both maintenance of the software and addressing improvement of the methodology contained in revised Recommendation ITU-R S.1503-3.

## 7.2 Software developments related to terrestrial services

**7.2.1 Implementation of No. 9.19 of the Radio Regulations**

The Bureau has completed development of the software module for notice treatment of terrestrial services under the new RoP on RR No. **9.19**.

**7.2.2 Integration of spectral power density verification for the broadcasting service notifications under provision 5.1.3 of the GE06 Agreement**

The relevant BR tools have been updated to perform the check of the condition specified in provision 5.1.3 of the GE06 Agreement in accordance with Appendix 4 of the RR and provision 5.1.3 of RoP Part A10.

**7.2.3 HFBC Software**

In order to facilitate the coordination process and exchange of data between HFBC notifiers, the Bureau took the decision to discontinue the CD-ROM publications at the end of 2018 and make available the HF Broadcasting Schedules and compatibility results online and free of charge.

To this end, it is planned to migrate the current HFBC end-user and processing software from Visual Basic to C# and start online publication of HFBC schedules as from 2019.

**7.2.4 Compatibility analysis software for planning Digital Terrestrial Television (DTT) in the Central America and Caribbean sub-region (CAC)**

In order to assist the Central America and the Caribbean sub-region in planning the deployment of digital terrestrial television and other services in the VHF/UHF bands, the Bureau developed and enhanced the compatibility analysis software which had been developed for the GE06 Conference and improved for previous frequency planning activities in Region 1. The software considers all the DTT standards and the two channel rasters (6 MHz and 8 MHz) used in the region. The current software tools are capable of performing:

* digital-to-digital, digital-to-analogue and analogue-to-digital compatibility analysis. It is available on eTools, as calculation on-demand;
* visualization and interpretation of the compatibility analysis results through the display software CA\_Display.

The Bureau is currently working on the implementation of the compatibility analysis between digital broadcasting and fixed/mobile stations.

## 7.3 Other developments

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

In 2017, the BR needed to urgently maintain existing legacy software, namely in order to improve:

* Software application security: the BR put in place processes to detect and mitigate antivirus false positives, as well as introducing the use of digital signatures for executable and database files.
* Technical examination software capacity and performance: in 2017, administrations submitted large GSO networks, both in planned and non-planned bands, which surpassed by far the limits of the legacy examination software. This required several person-months of software redesign and testing.

In addition, the BR started to implement examination software for PFD examination of non-GSO networks, with higher priority than redesigning legacy software for PFD examinations of GSO networks.

Therefore, although the urgent demands for software changes after WRC-15 were largely completed in 2017, the BR was not able to fully dedicate resources to the implementation of all the proposed improvements to the BR Space Information Systems, as described in Annex 1 to this document.

### 7.3.2 Intellectual Property Rights (IPRs)

In a joint project with the Telecommunication Standardization Bureau (TSB) and the IS Department, the Bureau pursued its work on the necessary alignments of the ITU-R/ITU-T patents databases. This activity is still ongoing (See [www.itu.int/ipr](http://www.itu.int/ipr)).

### 7.3.3 Development and further enhancement of web tools

In 2017, the Bureau has further enhanced **eBCD2.0 platform** for terrestrial broadcasting services. This platform includes the software packages enabling the display of the outgoing correspondence for broadcasting services in myAdmin portal, following the approval of the Rule of Procedure on treatment of reminders.

The Bureau developed an interface linking the BR Document Management System and online portal “myAdmin” to make outgoing correspondence available to administrations on “myAdmin” portal, including automatic email notification of new correspondence to official focal points.

In addition, the Bureau launched a project for the enhancement, by using a lighter technology, and generalization of the online tools for all terrestrial services.

### 7.3.4 Phasing out of the Ingres platform

Given the obsolescence of the Ingres platform used for a number of BR applications, the Bureau commenced a gradual migration from Ingres to SQL server. The migration of the MARS database from Ingres to SQL server is under process, due for completion by August 2018.

The work on the migration of ***TerRaSys*** has started. The terrestrial assignments database and the corresponding data is now available under the new DBMS (SQL Server) for testing. This includes the migration of the database schemas, stored procedures, archiving procedures and database maintenance and backup procedures. Work on aligning the various software modules code (validation, examination, etc.) to use this new platform is undergoing.

### 7.3.5 BR Geographic Information Systems (GIS)

The Bureau is currently studying its internal needs and existing technologies for creating a common GIS Platform and data, with focus on Open Source tools. A partnership with the UN Geospatial Section has been also established in order to benefit from UN GIS expertise and resources.

### 7.3.6 Migration of Study Groups’ mailing lists to a modern mailing list platform

As part of the in-house activity to migrate Study Groups’ mailing lists (both active lists and lists that have been disbanded/archived) to a modern platform, the BR has redesigned the mailing list self-service pages for study group delegates. The modernized self-service pages are to be made available to delegates in the first quarter of 2018.

# 8 Membership outreach

Outreach activities include the information and assistance to membership, the publication of ITU-R outputs and their dissemination, the organization of, and the participation in, seminars and workshops, and 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 and familiar to the ITU membership and to stakeholders of spectrum, and that they form the basis for the formulation of spectrum management policies and decisions and for the use of radiocommunications in general. 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

After the publication of the 2016 Edition of the Radio Regulations, in December 2016, the consolidated version of the Rules of Procedure was published during in May 2017. An update was published in November 2017.

### 8.1.2 Service publications

#### 8.1.2.1 Background and general observations

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

In view of the importance of the operational information contained in the maritime-related service publications, particularly with regard to safety, administrations are required to communicate the necessary amendments, as stipulated in No. **20.16** of the RR. It should be noted however, that the BR’s concerns reported to previous RAG meetings on the fact that administrations do not always provide regular updates of the information to the BR, are still valid.

Furthermore, information contained in the maritime-related service publications, in particular the List of Ship Stations and Maritime Mobile Service Identity Assignments (List V), are also used for other administrative procedures (e.g. eligibility for additional MIDs).

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

The 2017 edition of List IV have been prepared during this reporting period and published in November 2017. This List is composed of a paper booklet containing the Preface and Reference tables and a CD‑ROM containing the contents of the booklet as well as information notified to the BR on coast stations, pilot stations, port stations, VTS stations, etc.

Information pertaining to this list is also made available via the online information system ITU Maritime mobile Access and Retrieval System (MARS). In addition, the Bureau continues to provide, every six months, a compilation of all changes notified to the ITU for this period.

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

The 2017 edition of the List of Ship Stations and Maritime Mobile Service Identity Assignments (List V) was published in March 2017. This List is composed of a paper booklet containing the Preface and Reference tables and a CD‑ROM with the contents of the booklet as well as the information notified to the BR on ship stations, search and rescue (SAR) aircraft assigned an MMSI, etc.

Information pertaining to this List is also made available via the online information system ITU Maritime mobile Access and Retrieval System (MARS), on a daily basis. A compilation of all changes notified to the ITU is provided every three months via ITU MARS.

Due to an inadvertent processing error, a number of ships of one Administrations were not included in the March 2017 publication. In order to rectify this error and ensure that List V carries complete and correct information, a special edition, replacing the original March 2017 publication, was prepared and issued in June 2017.

This corrected version of the 2017 edition of List V was also posted on the ITU website: <http://www.itu.int/en/ITU-R/terrestrial/mars/Pages/default.aspx> for free download.

In order to avoid recurrence of such situations in the future, the Bureau developed and implemented several internal administrative and technical measures aimed at the improvement of processing ship stations submission submitted by administrations.

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

No edition of this List was issued in the reporting period.

#### 8.1.2.5 List of service publications issued

Table 8.1.2.5-1 below summarizes the different publications prepared and delivered during the period 2014-2017:

TABLE 8.1.2.5-1

Summary information regarding the service publications issued in the period 2014-2017

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **2014** | **2015** | **2016** | **2017** |
| List IV (List of Coast Stations and Special Service Stations) | - | Edition of 2015 (November) | - | Edition of 2017 (November) |
| List V (List of Ship Stations and Maritime Mobile Service Identity Assignments) | Edition of 2014 (March) | Edition of 2015 (March) | Edition of 2016 (March) | Edition of 2017 (March)  Special Edition (June) |
| List VIII (List of International Monitoring Stations) | - | - | Edition of 2016 ( December) | - |
| Maritime Manual | - | - | Edition of 2016 (November) | - |

### 8.1.3 Study Groups and other publications

Since WRC-15, the preparation of ITU-R Study Groups and other publications followed the standard pattern, as foreseen in the Operational Plan, notably:

– All Recommendations issued from 2005 to 2015 (1,065) are now available in the six ITU languages (A/C/E/F/R/S);

* From 2016 to 2017, one hundred ITU-R Recommendations were published (posted) on the ITU website in English (E); it includes revised and new Recommendations. Translation to the remaining five languages is in progress
* ITU-R Reports: 72 were published (posted) on the ITU website (E) for this same period 2016-2017.

– ITU-R Handbooks (75 published; by default the English version, unless otherwise indicated):

### 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 compares the number of deliveries for the RR-2012 (released in December 2012), and RR-2016 (released in December 2016). This comparison shows that the free online access policy had no impact on the level of sales. The huge number of free downloads (compared to sold versions) illustrates the positive impact of this policy. Also, downloads were made from 182 countries, representing 94% of ITU Membership.

Table 8.1.4.1-1

Comparison of deliveries of the Radio Regulations and RoP (versions 2016 vs 2012)

|  |  |  |
| --- | --- | --- |
|  | **Sold** | **Free Download** |
| *RR-12 (48 months deliveries)* | 19,593 | 38,947 |
| *RR-16 (since December 2016)* | 5,044 | 2,374 |
| *RoP 2012* ***(****since Council 2014 decision)* | 25 | 2,011 |

#### 8.1.4.2 ITU-R Recommendations

As a result of the free online access policy, ITU-R Recommendations have been disseminated worldwide, becoming a universal reference, reaching all audiences, regardless of their economic situation. In a 48-month period (January 2014 to December 2017), more than five million downloads of ITU-R Recommendations from ITU web site were recorded. Table 8.1.4.2-1 summarizes their distribution by year and series. At this time, there are 1,165 ITU-R Recommendations in force, hence the yearly average number of downloads is over one thousand per Recommendation.

Table 8.1.4.2-1

Distribution of ITU-R Recommendations

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **SERIES** | **2014** | **2015** | **2016** | **2017** | **Total** | **%** |
| **P** | 162,115 | 187,575 | 364,869 | 316,019 | **1,030,578** | **20.43%** |
| **BT** | 128,764 | 155,065 | 235,758 | 208,528 | **728,115** | **14.43%** |
| **M** | 128,540 | 178,190 | 301,869 | 269,185 | **877,784** | **17.40%** |
| **SM** | 83,165 | 102,711 | 187,123 | 152,305 | **525,304** | **10.41%** |
| **BS** | 69,700 | 77,553 | 135,300 | 131,647 | **414,200** | **8.21%** |
| **F** | 95,712 | 109,187 | 187,344 | 147,502 | **539,745** | **10.70%** |
| **S** | 55,473 | 63,020 | 123,412 | 103,445 | **345,350** | **6.85%** |
| **BO** | 14,664 | 18,651 | 32,637 | 28,578 | **94,530** | **1.87%** |
| **SA** | 20,101 | 25,278 | 36,547 | 32,071 | **113,997** | **2.26%** |
| **RS** | 9,319 | 16,055 | 20,044 | 18,827 | **64,245** | **1.27%** |
| **V** | 19,115 | 15,135 | 22,757 | 25,168 | **82,175** | **1.63%** |
| **TF** | 11,155 | 16,662 | 20,511 | 15,181 | **63,509** | **1.26%** |
| **SF** | 8,762 | 13,704 | 22,779 | 18,354 | **63,599** | **1.26%** |
| **BR** | 8,502 | 11,240 | 15,632 | 16,844 | **52,218** | **1.04%** |
| **RA** | 5,221 | 7,744 | 12,514 | 9,589 | **35,068** | **0.70%** |
| **SNG** | 2,517 | 3,464 | 4,809 | 3,221 | **14,011** | **0.28%** |
| **TOTAL** | **822,825** | **1,001,234** | **1,723,905** | **1,496,464** | **5,044,428** | **100.00%** |
|  | **16.31%** | **19.85%** | **34.17%** | **29.67%** | **100.00%** |  |

#### 8.1.4.3 ITU-R Reports

As ITU-R Recommendations, ITU-R Reports have been disseminated worldwide, becoming a universal reference, reaching all audiences, regardless of their economic situation. In a 48-month period (January 2014 to December 2017), more than 1 million downloads of ITU-R Reports from ITU web site were recorded. Table 8.1.4.3-1 summarizes their distribution by year and series. At this time, there are 533 ITU-R Reports in force, hence the yearly average number of downloads is near 500 per Report.

Table 8.1.4.3-1

Distribution of ITU-R Reports

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **SERIES** | **2014** | **2015** | **2016** | **2017** | **TOTAL** | **%** |
| **M** | 56,556 | 87,523 | 112,794 | 76,531 | **333,404** | **32.47%** |
| **BT** | 28,263 | 51,911 | 57,135 | 44,340 | **181,649** | **17.69%** |
| **SM** | 36,134 | 57,537 | 79,217 | 53,616 | **226,504** | **22.06%** |
| **BS** | 12,414 | 18,803 | 25,988 | 24,015 | **81,220** | **7.91%** |
| **BO** | 6,849 | 12,567 | 15,321 | 10,541 | **45,278** | **4.41%** |
| **P** | 7,254 | 12,828 | 16,268 | 12,572 | **48,922** | **4.76%** |
| **S** | 2,633 | 6,701 | 8,330 | 6,152 | **23,816** | **2.32%** |
| **F** | 5,118 | 11,097 | 15,330 | 10,142 | **41,687** | **4.06%** |
| **RS** | 2,162 | 4,274 | 4,148 | 3,292 | **13,876** | **1.35%** |
| **RA** | 2,008 | 3,196 | 4,316 | 3,106 | **12,626** | **1.23%** |
| **SA** | 1,877 | 4,557 | 5,886 | 3,764 | **16,084** | **1.57%** |
| **SF** | 281 | 545 | 506 | 303 | **1,635** | **0.16%** |
| **BR** | 47 | 65 | 66 | 65 | **243** | **0.02%** |
| **TOTAL** | **161,596** | **271,604** | **345,305** | **248,439** | **1,026,944** | **100.00%** |
| **year %** | **16%** | **26%** | **34%** | **24%** | **100%** |  |

#### 8.1.4.4 ITU-R Handbooks

Table 8.1.4.4-1 provides the quantity of downloads of ITU-R Handbooks since the Council 2013 Decision. Following the BR Director’s decision in January 2017 to extend the free access to all ITU-R Handbooks, more than 2,000 downloads were registered within the year of this decision. Also, the downloads originate from the 193 ITU countries.

Table 8.1.4.4-1

Deliveries Distribution of ITU-R Handbooks 2014-2017

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Sales** | | **Free Downloads** | |
| **Handbook** | **2014-2016** | **2017** | **2014-2016** | **2017** |
| Spectrum Management Series | 96 | 31 | 4,750 | 1,162 |
| Other Handbooks | 503 | 80 | - | 2,084 |
| **Grand Total** | **96** | **31** | **4,750** | **3,246** |

### 8.1.5 ITU Radio Regulations navigation and analysis tools

The Bureau has finalized the development of software tools to facilitate the use and analysis of the Radio Regulations:

a) The Radio Regulation Navigation Tool was released during 2Q-2017 (RR Tool-16 v.1.0) based on the newest version of the RR. A free update is offered to purchasers of the previous version (RR Tool-12). This new version is available in English on Windows, macOS and Linux. The next update (RR Tool-16 v.1.1), based on the new Rules of Procedure (RoP-17 v.1), is in progress and expected to be released in 2Q-2018. This update will be offered for free to purchasers of the two versions (RR Tool-12 and RR Tool-16 v.1.0). Furthermore, yearly free updates will be released to incorporate the latest available RoP, and that until 2020 when a new version of the RR will be released, based upon the decisions of the WRC-19.

b) A software tool to conduct detailed search and analysis of the Table of Frequency Allocations of Article **5** of the Radio Regulations, enabling filtering and reformatting by frequency range, service, category of service, footnote, country, etc.. The tool is based on RR-16 Edition and RoP-17 v.1. The beta test phase involved 50 volunteers from 15 countries and ended in November 2017. The package is now released on the ITU publication web site, and all software and data updates will be provided regularly to the subscribers.

## 8.2 Seminars and workshops

Following WRC-15, BR started (as of January 2016) a new intra-WRCs World and Regional Radio Seminars cycle, aimed at disseminating worldwide the revision of the Radio Regulations made byWRC-15 and the associated Rules of Procedure.

### 8.2.1 World and Regional Radiocommunication Seminars

### There was no WRS in 2017. The next WRS will take place in Geneva during the fourth quarter of 2018.

As a complement to the biennial Word Radiocommunication Seminars, the BR kept implementing its strategy for regional outreach through the organization of yearly cycles of Regional Radiocommunication Seminars (RRS), held in different regions worldwide, fostering human capacity building on the use of the radio-frequency spectrum and the satellite orbits, in particular the application of the provisions of the ITU Radio Regulations.

RRSs 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.

Table 8.2.2-1 provides a summary of the RRSs held in the last four-year period. These seminars were hosted by the governments, the regulators or the spectrum management authorities of the host countries, in cooperation with the relevant regional organizations and the ITU regional/areas offices. RRS were conducted in a “paperless” environment. The proceedings are available on the ITU website: <http://www.itu.int/ITU-R/go/seminars>. The BR provided 105 partial fellowships for RRS and 30 full ones for WRS (always one per administration for eligible countries).

An analysis of the participation in WRSs and RRSs shows that these two types of seminars complement each other:

– **In two WRS**: 810 participants from 130 countries

– **In twelve RRSs**: 1093 participants

Three RRS are being planned for 2018.

Table 8.2.2-1

ITU Regional Radiocommunication Seminars (2014-2017)

| **Date** | **RRS** | **Place** | **Host** | **Cooperation** | **Forum Topics** | **Languages** | **Participants/ administrations** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2014** | | | | | | | |
| 26-30 May 2014 | **RRS-14-Asia** | Ha Noi, Viet Nam | MIC  Viet Nam | APT, ITU Asia-Pacific Office | New issues on Spectrum Management | **E** | **94/15** |
| 14-18 July 2014 | **RRS-14-Americas** | Island of Tobago, Trinidad and Tobago | Telecommunications Authority of Trinidad and Tobago | CTU, ITU Americas Office | WRC-15 Agenda: Regional matters  C-band registration | **E** | **46/19** |
| **2015** | | | | | | | |
| 2-6 March 2015 | **RRS-15-Eastern Europe and CIS** | Bishkek, Kyrgyz Republic | State Communications Agency - Kyrgyz Republic | RCC, ITU Offices for Eastern Europe and CIS | WRC-15 regional preparation | **R** | **56/8** |
| 20-24 April 2015 | **RRS-15-Africa** | Niamey, Niger | Autorité de Régulation des Télécommunications et de la Poste, ARTP, Niger | ATU, ITU offices for Africa | Emerging concepts in spectrum utilization and monitoring: Preparing for future spectrum management for the region | **F, E** | **100/36** |
| 25-30 May 2015 | **RRS-15-Asia-Pacific** | Manila, Philippines | Information and Communications Technology Office, Department of Science and Technology (ICTO‑DOST), Philippines | APT, Dpt of Communications, Government of Australia, ITU offices for Asia and Pacific | Space Planned Services: current status and challenges | **E** | **70/20** |
| 27-31 July 2015 | **RRS-15-Americas** | San Salvador, El Salvador | Superintendencia General de Electricidad y Telecomunicaciones of El Salvador (SIGET) | COMTELCA, ITU area office for Central America | WRC15: Challenges and opportunities for the Region  C-band registration  Unlicensed Devices Regulations | **S** | **70/16** |
| **2016** | | | | | | | |
| 18-22 July 2016 | **RRS-16-Americas** | Port of Spain, Trinidad and Tobago | Caribbean Telecommunications Union (CTU) | ITU Americas Office | WRC-15 outcomes and WRC-19 Agenda: Regional Challenges and Opportunities for Spectrum Harmonisation | **E** | **31/14** |
| 19-23 September 2016 | **RRS-16-Asia-Pacific** | Apia, Samoa | ICT Ministry. Samoa | ITU Asia&Pacific Office | Bridging the Digital divide on the region: role of Radiocommunications Technologies" | **E** | **78/15** |
| **2017** | | | | | | | |
|  | **RRS-17 Africa** | Senegal | Ministere des Postes et Telecommunications (MPT) and the Autorité de Régulation des Télécommunications et de la Poste (ARTP) | African Telecommunications Union (ATU). | WRC-19 Agenda: challenges and opportunities for Africa | E/F | 185/35 |
|  | **RRS-17 Americas** | Peru | Ministerio de Transportes y Comunicaciones (MTC) | Inter-American Telecommunications Commission (CITEL) | Transition to 5G: Present and Future in Latin America | S | 70/12 |
|  | **RRS-17 Asia-Pacific** | Cambodia | [Ministry of Posts and Telecommunications of Cambodia (MPTC)](http://www.mptc.gov.kh/). |  | Transition to 5G in the Region | E | 140/22 |
|  | **RRS-17 Arab** | Oman | [Oman Telecommunications Regulatory Authority (TRA)](https://www.tra.gov.om/), | ASMG | WRC-19 Agenda: challenges and opportunities for Arab Countries | A/E | 153/15 |

### 8.2.2 Other Events

Support was also provided to other ITU seminars related to topics such as spectrum management, space radiocommunication applications, Climate Change and Emergency Telecommunications. Other events supported included Satellite Symposia and the Internet of Things Workshop. Events organized within ITU-R can be found at: <http://www.itu.int/ITU-R/go/seminars>. Table 8.2.2-1 illustrates this activity. Some relevant events during 2014-2017 period are:

* International Satellite Symposiums: 5 Symposia in: Bangkok Thailand (2), Da-Nang (Vietnam), Denpasar (Indonesia), Bariloche (Argentina)
* Small satellite Symposia: 2 events in: Prague (Czech Republic), Santiago de Chile (Chile).

## 8.3 Assistance to Member States

### 8.3.1 Assistance to administrations of developing countries

Since 2014, the Bureau provided assistance to the administrations of developing countries in more than 50 instances, in areas such as:

– Supporting national spectrum management activities in the rapidly changing regulatory environment (see Resolution **7 (Rev.WRC‑03)**) and providing technical assistance in the field of space radiocommunication (Resolution **15 (Rev.WRC‑03)**; to this end, missions were undertaken upon request by administrations or jointly organized with the BDT, including participation of BR experts to provide capacity building in regional seminars organized by BDT or regional organizations. Furthermore, experts from administrations of least developed countries were granted fellowships to attend BR radiocommunication seminars and workshops. Experts from administrations also received for individual or group in‑service training in the ITU headquarters on radio regulatory procedures.

– Participating in the meetings of the regional coordination groups, as requested by Article **12** of the Radio Regulations.

– Participating in capacity building seminars on satellite communications.

– Providing assistance in Long Term Frequency management and assignment for mobile broadband (IMT).

– Providing guidance and technical support for the transition to Digital Television and the allocation of the digital dividend.

Table 8.2.2-1 illustrates this activity.

### 8.3.2 Assistance to regional groups

The Bureau continues its participation in the meetings of the regional coordination groups (HFCC), as requested by Article **12** of the Radio Regulations, providing the necessary assistance and collaboration.

Table 8.2.2-1

Participation of BR staff to events disseminating information

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **2014** | | **2015** | | **2016** | | **2017** | | **TOTAL** |
| **Missions** | **Countries** | **Missions** | **Countries** | **Missions** | **Countries** | **Missions** | **Countries** | **MISSIONS** |
| ***SPECIALIZED UN AGENCIES*** | 17 | 12 | 24 | 9 | 33 | **13** | **23** | **11** | **97** |
| ***REGIONAL TELECOMMUNICATION ORGANIZATIONS*** | 33 | 25 | 74 | 34 | 57 | **32** | **49** | **37** | **213** |
| ***Non-ITU CONFERENCES & SYMPOSIA*** | 59 | 43 | 57 | 45 | 83 | **40** | **51** | **32** | **250** |
| ***ITU SEMINARS, WORKSHOPS & MEETINGS*** | 29 | 22 | 33 | 19 | 39 | **19** | **27** | **26** | **128** |
| ***ASSISTANCE REQUESTS*** | 9 | 6 | 14 | 7 | 8 | **5** | **8** | **8** | **39** |
| ***OTHER EVENTS*** | 10 | 8 | 31 | 14 | 14 | **10** | **15** | **11** | **70** |
| **TOTAL** | **159** | **118** | **233** | **128** | **234** | **119** | **173** | **125** | **797** |

### 8.3.3 Assistance to other groups of countries

The Bureau organized the following frequency coordination meetings:

* In close collaboration with the Comisión Técnica Regional de Telecomunicaciones (COMTELCA), the Caribbean Telecommunications Union (CTU) and the Inter-American Telecommunication Commission (CITEL), a series of regional frequency coordination meetings on the use of the VHF/UHF bands in the countries of the Central American and Caribbean region. The first meeting took place from 8 to 10 March 2017 in Managua, Nicaragua and the second meeting in Guatemala City, Guatemala from 28 August to 1 September 2017;
* A multilateral coordination meeting on television broadcasting between Algeria, France, Morocco and Libya from 14 to 16 February 2017. The meeting was organized and assisted by the Bureau following the decision of the 73rd RRB meeting, and resulted in the percentage of coordinated assignments near 100%;
* A multi-lateral coordination meeting on 11 and 12 October 2017 in Rome between Italy and neigbouring countries to solve cases of harmful interference between FM broadcasting sound stations. The Bureau organized and coordinated this meeting following the decision of the RRB at its 75th meeting.
* Four ITU/ITSO Capacity Building Workshops on Satellite Communications were organized in Abidjan (Cote d’Ivoire) from 10 to 14 July 2017 (for French-speaking African countries), in Nairobi (Kenya) from 17 to 21 July 2017 (for English-speaking African countries), in Giza (Egypt) from 8 to 12 October 2017 and, in collaboration with the Carribean Telecommunications Union (CTU), in Grenada from 16 to 20 October 2017. These workshops are part of a capacity building partnership between the ITU and ITSO for the delivery of satellite communications related training.
* In addition, the Bureau hosted three satellite coordination meetings between: the Russian Federation and the United Arab Emirates, Australia and the Russian Federation, Australia, Malaysia and the United Kingdom of Great Britain and Northern Ireland, as well as the Operator Review Meeting (ORM) of the Memorandum of Understanding on Regions 1 and 3 multilateral GSO/MSS intersystem coordination for the frequency bands 1525-1544/1545-1559 MHz, 1626.5-1645.5/1646.5-1660.5 MHz.
* At the request of the Administration of Azerbaijan and in order to resume the activities of the Coordination Group of the Black Sea, Caspian Sea and Central Asian countries, the Bureau invited the Administrations of Armenia, Azerbaijan, Georgia, Iran (Islamic Republic of), Kazakhstan, Kyrgyzstan, the Russian Federation, Tajikistan, Turkmenistan and Uzbekistan to attend a multilateral frequency coordination meeting, which is intended to facilitate coordination of all radio services operating in the frequency range between 470 MHz and 862 MHz. The meeting took place from 30 to 31 March 2017 at ITU Headquarters in Geneva.
* The Bureau assisted Azerbaijan and New Zealand, and hosted delegations from: China, Cyprus, Gabon, Indonesia, Kenya, and Morocco, to respond to their respective technical assistance requirements, mainly related to frequency coordination matters.

## 8.4 Inter-sector Cooperation

### 8.4.1 Cooperation with ITU‑D

As reported in Sections 8.1 to 8.3 above, the BR continues to pursue its objective of informing and assisting the ITU membership, in particular in developing countries, on issues relating to radiocommunication matters. For this purpose, the BR organizes and participates in a number of spectrum related workshops, seminars, meetings and capacity building activities. These actions are being carried out in close cooperation with the BDT and the ITU regional and area offices, and the relevant international organizations and national authorities.

In particular, the BR keeps participating on Meetings and Workshops of Experts on WTDC Resolution 9 (Rev. Dubai, 2014), as well as those of Expert Group on Telecom-ICT Indicators (EGTI), aimed to review the mobile and wireless broadband access indicators, and the new ones (under preparation) related to IMT-2020.

#### 8.4.1.1 GSR

Recognizing the importance of expert information to Member States, the BR continues to support the BDT by providing technical expertise in relation to spectrum management, digital broadcasting and digital dividend. The BR contributed to the ITU Global Symposium of Regulators 2014, 2015, 2017) with the organization of, and participation in, sessions related to spectrum management, with emphasis in 5G and new spectrum management trends.

#### 8.4.1.2 ICT Survey and ICT Eye

ICT-eye and its survey form an essential tool for gathering data from administrations on key ICT metrics. The BDT does the tracking of such data on a yearly basis, and displays the data results in a meaningful way in the statistics portal. In order to capitalize from the existing platform provided by ICT-eye, the BR cooperated with the BDT to expand the current survey and include a chapter on key spectrum-specific information (i.e. auctions, caps, mobile technologies/standards, spectrum licensing). The spectrum chapter was developed by BR and published in the ICT survey for the first time in 2013. BR kept working closely with BDT in collecting, processing, and disseminating this chapter. This chapter in under revision to fit better the manner regulators use to classify the mobile broadband technologies, as well as including a new section about IMT frequencies national allocation and assignments (in progress)

#### 8.4.1.3. World Telecommunication/ICT Indicators Symposium, WTIS

The BR cooperated with the BDT on the indicators and definitions for gathering data on mobile broadband technologies, especially when referring to standards. In that context, the BR made presentations during WTIS-14, WTIS-15 and WTIS-16. During WTIS-17, the BR participated in the process to prepare indicators for 5G, and IMT frequencies national allocation and assignments

This activity is closely coupled with the work on ITU-R KPIs.

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

Close contact has continued with the BDT on work 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, transition towards and implementation of IMT, and broadband wireless access technologies. These topics are in addition to the collaboration undertaken through ITU‑D Question 9-3/2 that calls for the identification of study topics in ITU‑R (and ITU‑T) considered of particular interest to developing countries.

In response to requests from the BDT, experts from ITU‑R and BR have participated in ITU seminars and workshops organized by ITU‑D (see also Section 8.2.4). Within the framework of Resolution ITU‑R 11-4 (Further development of the spectrum management system for developing countries), BR has been involved with the design, testing and training associated with the software SMS4DC (Spectrum Management System for Developing Countries), with advice provided on the use of relevant ITU‑R Recommendations. In addition, ITU‑R Study Group 1 has continued to work closely with the ITU‑D Study Groups in pursuing studies on spectrum usage in accordance with Resolution ITU‑D 9.

With the needs of developing countries always in mind, the production of Handbooks has continued to be viewed as a major Study Group activity. In this respect, new or revised Handbooks have been developed on topics such as spectrum monitoring, radiowave propagation information for designing terrestrial point-to-point links, amateur and amateur-satellite services, migration to IMT-2000 systems and use of radio spectrum for meteorology – weather, water and climate monitoring and prediction.

Since 2013, the BR 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 (conducted in 2015 and now under evaluation). In 2016, improvements were integrated on the basis of received feedbacks. In 2017 a complete revision was made, and ITU started conversations with some regulators in Latin-America, interested in an edition of SMTP specifically oriented to their Staff.

### 8.4.2 Cooperation with 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, intelligent transport systems, common patent policy and intellectual property rights and audio-visual media accessibility.

BR representatives attended the World Telecommunication Standardization Assembly 2016. The BR was also present at the Kaleidoscope academic conferences organized by ITU-T during ITU Telecom World 2016, where the BR chaired a session on Spectral efficiency in wireless networks.

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

Furthermore, BR and TSB jointly organized a session on 5G/IMT 2020 during GSR-17.

### 8.4.3 Cooperation with international and regional organizations

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) help coordination leading to more effective preparation for events such as WRCs; and 3) keep ITU‑R abreast of relevant activities in other organizations to help planning of work programmes.

The Bureau continues its close cooperation with the relevant international and regional organizations dealing with the use of spectrum (APT, ASMG, ATU, CEPT, CITEL and RCC), broadcasting organizations (ABU, ASBU and HFCC) or more generally with the use of radiocommunication services (e.g. ITSO, ESOA, GVF, GSMA, EBU) by organizing, promoting and participating in events to build capacity on the use of the RRs, including WRS and RRS, as indicated in Section 8.2.

The Bureau continues to participate in the activities of the Global Standards Collaboration (GSC). Involvement with the 3G partnership projects and IEEE has been maintained, given their importance and relevance to the work of Study Group 5. Other notable areas of liaison with Study Group activities include those with the World Meteorological Organization (through SG 7), CISPR (through SG 1), the World Health Organization (through SG 6), Space Frequency Coordination Group (through SG 7) and the European Broadcasting Union (through SG 6).

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 Maritime Satellite Organization (IMSO), 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.

## 8.5 Evolution of ITU-R Sector Members, Associates and Academia

Table 8.5-1 shows the stability of the number of ITU-R Sector Members, Associates and Academia during since 2015.

Table 8.5-1

Evolution of the ITU-R membership since 2014

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **2014** | **2015** | **2016** | **2017** | **2017 VS 2014** | **% Increase** |
| **Sector Members** | 262 | 276 | 267 | 264 | +2 | +1% |
| **Associates** | 19 | 22 | 20 | 21 | +2 | +11% |
| **Academia** | 30 | 109 | 133 | 126 | +94 | +313% |

### 8.6 Communication and promotion

In order to position the ITU-R in line with its strategic objectives (create brand value, strengthen reputation, mobilize internal and external stakeholders, engage supporters and advocate in the interests of membership). The Bureau works in close collaboration with the Corporate Communications Division (CCD) and ITU Press Office, the membership Department and the Publication and Composition Service (C&P/COMP) of the General Secretariat. This work has included several ITU Inter-Sector meetings: WSIS Implementation Task Force, Communications Groups, Web Editorial Board, Emerging Trends and Gender Task Force Group.

### 8.6.1 Website

The BR continued to support the ITU-R Sector strategic goals, with communications issued through the BR website [www.itu.int/ITU-R/](http://www.itu.int/ITU-R/), which is regularly updated reflecting the work being undertaken by the Sector and, as far as possible, in the six official languages of the ITU.

ITU-R communications continued to distribute information via the ITU-R Newsroom. In addition, since 2017 marked the 90th anniversary of the CCIR/ITU-R Study Groups (1927-2017), a dedicated website was created to provide information on this celebration (see: [www.itu.int/go/ITU-R/90](http://www.itu.int/go/ITU-R/90)) targeting primarily ITU membership, ITU-R Study Groups participants and delegates, specialized technical magazines, research institutions, media, ITU staff and the general public, these events highlighted the eminent role of the ITU-R Study Groups in enabling and shaping the overall wireless ecosystem and ensuring its sustainable development.

### 8.6.2 Promotion and media relations

#### 8.6.2.1 Media Communications

Subjects of interest to the media in 2017 were responded to after careful coordination with BR and ITU Communications, BR Management and relevant radiocommunication experts.

The BR continued to support the ITU-R Sector strategic goals, with communications issued through the ITU Communications and Press Office and social media channels, the ITU-R Newsroom <https://twitter.com/ITU_R> and BR website [www.itu.int/ITU-R/](http://www.itu.int/ITU-R/) during 2017:

40 press releases and 25 communiqués were issued in 2017, as well as 10 media advisories invited the press to attend ITU-R key events.

During 2017, 60 media queries and requests for interviews and additional requests for information were received. They were responded to, either by correspondence or through interviews given by BR experts, Chairmen of the ITU-R Study Groups or the BR Director.

#### 8.6.2.2 FAQs

BR continues to regularly update the various sets of Frequently Asked Questions (FAQs). They are available for consultation by the media, industry and general public and currently cover the following topics:

– Radio Regulations (RR), ITU-R Study Groups (SG), RRB, RAG, BR;

– International Mobile Telecommunications (IMT) and Wireless Broadband;

– Digtial Dividend and the Digital Switchover (DSO)

– Universal Time Scale (UTC) – Leap Second;

– Satellite Filings and associated procedures.

They can be found online on the right-hand top of the ITU-R web page (<http://www.itu.int/en/ITU-R/Pages/default.aspx>.

#### 8.6.2.3 Branding communications

During 2017, standard branding (rollups, virtual e-banners, e-posters, e-certificates, social media announcements etc.) photos, videos, multimedia were prepared for the Regional Radiocommunication Seminars and keynote meetings and events organized by the BR.

2016–2017 saw a significant rebranding of the ‘one ITU’ visual communications across the ITU- Sectors with templates and the UN blue as the basis for all top-level branding with the Radio Regulations red maintained for the BR Seminars and Workshops.

Notably, the 2nd ITU/WMO Seminar 'Use of Radio spectrum for Meteorology: Weather, Water and Climate Monitoring & Prediction' was organized in Geneva, Switzerland on 23-24 October 2017 with the issue of a joint Handbook on the same subject.

For the 90th anniversary of the **CCIR/ITU-R Study Groups** (1927-2017), the following additional communication activities were undertaken:

– A dedicated edition of [ITU e-news magazine anniversary special edition - '90 years of global collaboration'](https://www.itu.int/en/itunews/Pages/default.aspx)

– [Press Release](https://www.itu.int/en/mediacentre/Pages/2017-PR62.aspx) and Media Advisory distributed, the [ITU Media Centre](https://www.itu.int/en/mediacentre/Pages/default.aspx) and the [ITU-R Newsroom](https://twitter.com/ITU_R/):

– Dedicated website: [www.itu.int/go/ITU-R/90](http://www.itu.int/go/ITU-R/90)

– BR Director’s [Video message](https://youtu.be/R9m-D5krTOU) and [Photos](https://www.flickr.com/photos/itupictures/albums/72157688779923801)

– Social media outreach with hashtag #CCIR90ITUR

– 3 x [Panel discussions and keynote speeches by membership and industry](https://www.itu.int/en/ITU-R/RR110/Documents/RR110-Programme.pdf) representatives during the following events:

* As part of the WSIS Forum 2017 in Geneva, a [high-level session](https://www.itu.int/net4/wsis/forum/2017/Agenda/Session/276#intro) on '[ITU enabling the wireless ecosystem](https://www.itu.int/net4/wsis/forum/2017/Agenda/Session/276#intro)', was held on 12 June 2017. See [Webcast](https://www.itu.int/en/ITU-R/information/events/webcast/Pages/default.aspx): Archives.
* As part of ITU Telecom World 2017 (Busan, South Korea): a panel session on: 'Enabling and shaping the wireless ecosystem: Celebrating the 90th anniversary of CCIR/ITU-R Study Groups', was held on 27 September 2017.
* The actual ceremony for the 90th anniversary of the ITU **CCIR/ITU-R Study Groups** (1927-2017), with keynote speeches and an industry panel, was held during the Inter-regional Workshop on WRC-19 Preparation on 21 November 2017 (ITU HQ Geneva). See Webcast: [Archives](https://www.itu.int/webcast/archive/ccir90th/). The event was attended by 357 participants from 59 Member States and 47 Sector Members.

These celebrations gave the opportunity to showcase the essential role of ITU-R activities and processes to enable and shape the sustainable development of the radiocommunication ecosystem globally.

#### 8.6.2.4 Exhibitions and Demos

Throughout ITU Telecom World 2017 (Busan, South Korea), BR and BDT shared a joint ITU-R/ITU-D Pavilion, populated by Sector members stands (ATDI, ATU, CTO, GSMA, ICT Volunteers, LS telcom, NTT Korea, PITA, Rohde&Schwarz and Vodafone Egypt), and the ITU Bookshop, with 13 banners describing CCIR/ITU-R Study Groups activities and achievements.

In addition, a demo was organized by ITU-R Study Group 6 (SG6) Special Session in honor of 90 CCIR and 45 years of HDTV studies.

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ANNEX

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| **BR Space Information Systems Progress Report** |
| **Phase 2: 1 April 2012 – 31 December 2015** |
| **Business Continuity and Disaster Recovery\***  Starting January 2015, the Bureau adopted a two-phase approach (with both phases running in parallel) in order to identify and mitigate the relevant threats and vulnerabilities. With the help of external consultants and ISD, the Bureau conducted an assessment analysis of the infrastructure (servers, LAN, databases, etc.) used in accessing the BR databases, both from inside and outside the ITU. The Bureau also conducted its analysis and evaluation in order to establish the required BC/DR Plan, so as to minimize both the risks of data loss and the delays associated with the risk of loss of operations in the processing of frequency notifications. An established task group developed a plan to test the backup and recovery procedures. It listed the core software applications and data, extracted data categories (databases, files…) and created a disaster recovery plan for each category. Work shall continue with ISD during the coming period to finalize the testing and apply the resulting established measures.  \*This work applies to both Space and Terrestrial Services |
| **Rewrite legacy software for technical examination**  • Rewrite PFD for protection of terrestrial services calculation: Ongoing  • Rewrite AP8 calculation: Internal testing to start in first quarter 2018  • Rewrite PFD for protection of space services: Ongoing  • Migrate technical examination software written in Fortran from Compaq Visual Fortran compiler to Intel Fortran compiler  – GIBC/Appendix 30B, Mspace, GIBC/PowerControl: Completed  – GIMS Fortran components: Not yet started  • Mspace – migration of data access component from VB6 to Intel Fortran: Completed  • GIBC/Appendix 7: Completed |
| **Design and develop the BR Space Information System (BR SIS)**  In 2012, BR Space had many standalone applications written in VB6 and VO with their own specific interfaces. The aim is to build one single user interface that will integrate in the future all BR Space services using state-of-the-art technologies.  This task has been initiated and the proposed architecture validated with a prototype based on service-oriented architecture (SOA). The SOA separates the user interface from the service implementation. Each BR Space application will be exposed as an autonomous WCF (Windows Communication Foundation) service and could easily be deployed across both Windows and web platforms. WPF (Windows Presentation Foundation) technology, the leading modern user interface (UI) design tool, is being used for the design and development of the UI. WPF separates the presentation design layer from the logic layer.  The whole system uses a composite application design pattern (Prism is the Composite Application Guidance for WPF). This improves the system modularity and allows developers to build and maintain system modules independently.  SpaceQry is the first application rewritten in the BR Space Information System following the above architecture and will be used as a template for development of all BR Space applications. The querying service developed for SpaceQry may also be used by the future SNS Online as a web service. |
| **Rewrite SpaceQry written in Visual Objects**  Available on the BR IFIC DVD as of April 2016. |
| **Rewrite SpaceVal written in Visual Basic 6**  Integration of SpaceVal into BR-SIS has started and the application will be presented at WRS-18. |
| **Rewrite SpaceCap written in Visual Basic 6**  Integration of SpaceCap into BR-SIS has started and will be achieved by integrating one type of notice at a time. |
| **Migrate SRS.mdb to more modern technology**  The database files on the BR IFIC are currently in Microsoft Access MDB format, the development of which stopped with the 2003 version of Microsoft Office.  Several options have been evaluated, and SQLite has been chosen as the technology to replace MDB files. Connectivity is either achieved through direct connections (such as from C++ or .Net applications) or through ODBC.  However, the urgent changes for WRC-15 precluded the introduction of SQLite in 2017, and it will be introduced in 2019. In the meantime, the 2GB limitation of MDB files has been mitigated by delivering a digitally signed linked pair of MDB files on the BR IFIC DVD.  SQLite databases for testing will be made available to external users in Q1 of 2018, and the applications shipped on the BR IFIC DVD will be SQLite-compatible at the latest as of version 9 of the SNS database, which will implement WRC-19 decisions.  Backward compatibility with the MDB format, as well as conversion tools, will be retained for the foreseeable future, to allow external users sufficient time to adopt the new technology. |
| **Migrate SNS database on Ingres to SQL Server**  Owing to costs and resources, the IS Department is migrating its Ingres databases to SQL Server, therefore the BR Space SNS database should also be migrated.  No major changes would be required to the majority of BR Space Applications using ODBC to access the database. However, a number of Ingres-environment specific internal processing applications had to be completely rewritten as part of this migration in 2017. The remaining internal processing applications shall be rewritten or adapted in 2018.  Although internal tests in 2017 have demonstrated that the SNS Online legacy web site can be connected directly to SQL Server, so as to avoid the need for the intermediary Ingres database, this doesn’t change the fact that SNS Online is due for a complete reworking, having been designed using technology from 1995.  The future version of SNS Online can be based on ASP.NET MVC technology, which is currently used for the Space API Query part of the Space Network Systems web site and for the Resolution 908 implementation. |
| **Review SNTrack**  This task should be done in conjunction with the development of Resolutions 907 and 908. The current implementation is incompatible with 64 bits Windows Office, and this is another reason to migrate to a more modern implementation. |
| **Phase 3: 1 January 2016 – 31 December 2018**  The main themes of Phase 3 are:   * Design common conceptual database for terrestrial and space. * Define standard application framework for Space and Terrestrial Systems including Maritime System (MARS) based on ITU maritime databases. * Redesign Space System – (apply Service Oriented Architecture). * Consider centralized risk, recovery and security management   The work done during the previous phases, as well as the design and technology choices made, are all an excellent foundation for successful completion of Phase 3, as follows:   * The Space databases shall be migrated to the SQL Server platform by the end of 2018. At the end of 2016, the database schema was updated to the post-WRC-15 version 8 and presented at WRS-16, with a number of additions, deletions and changes of fields and tables.  A schema redesign, preserving equivalence of data, but with the objective to eliminate certain redundancies and to align with a common Space/Terrestrial approach, would be rolled out together with the changes needed for the implementation of WRC-19 decisions. * The desktop application frameworks for the Terrestrial System, the Space System and MARS have traditionally been quite different, and may continue to be so for the time being. The need to standardize on one framework diminishes as more and more functionality is offered through web applications. * The standard web application framework used for new development (e.g. SIRRS, Resolution 908) and for the redesign of existing Space System web applications (SNS Online) shall be ASP.NET MVC, which is also endorsed and supported by the IS department and is the web application framework on which the MARS project is being re-implemented. * The adoption of the .Net platform and the Prism design architecture will make it easier to transition from desktop applications to web applications, knowing that the preferred web application development framework is based on the same core technology and programming language. * Activities on centralizing and streamlining risk, recovery and security management are on-going. |

1. These include the ITU‑R Handbooks on National Spectrum Management; Computer Aided Techniques for Spectrum Management; and Spectrum Monitoring. [↑](#footnote-ref-1)