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| **World Radiocommunication Conference (WRC-19)Sharm el-Sheikh, Egypt, 28 October – 22 November 2019** |  |
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| **PLENARY MEETING** | **Addendum 1 to Document 4-E** |
| **6 September 2019** |
| **Original: English** |
| Director, Radiocommunication Bureau |
| REPORT OF THE DIRECTOR ON THE ACTIVITIES OF THE RADIOCOMMUNICATION SECTOR |
| part 1: activities of the radiocommunication sector in the period between WRC‑15 and WRC‑19 |
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# Introduction

This Report sets forth details on the activities undertaken by the Radiocommunication Sector since the last World Radiocommunication Conference. It takes into account information provided in Reports previously submitted to both the Radiocommunication Advisory Group and the Council, such as the operational plans for the concerned time-frame.

It is structured along with the four main activities of the Sector:

– To establish and update international regulations on the use of the radio-frequency spectrum and satellite orbits (Section 1).

– To implement and apply international regulations on the use of the radio-frequency spectrum and satellite orbits (Sections 2 and 3).

– To establish and update worldwide Recommendations, Reports and Handbooks for the most efficient use of the radio-frequency spectrum and satellite orbits (Sections 4 and 5).

– To inform and assist the ITU-R membership in radiocommunication matters (Sections 6, 7, and 8).

# 1 WRC-19 preparations

## 1.1 BR preparations for WRC‑19

The Bureau’s preparations for WRC‑19 are following the usual process. The Bureau prepared its Report to the conference pursuant to the provisions of CV180 and item 9 of the agenda. The contributions from Member States are processed in the standard manner and are posted in a timely way on the web. The necessary documents have been prepared for the attention of the Members States (e.g. CA/245 and its Addenda, dealing with guidelines and tools for submission of proposals, delegate registration, publication and consultation of documents, etc.).

The activities of the Study Groups in preparation for WRC‑19 are described in Section 4.3.

In keeping with Decision 5 of the Plenipotentiary Conference (Rev. Dubai, 2018), it was decided that WRC-19 will be conducted in a paperless environment. All documents will be available electronically on the WRC‑19 website. In addition, an ITU Sync Application will enable the expeditious download and synchronization of WRC‑19 documents from the ITU servers.

## 1.2 Regional preparations in response to Resolution 72 (Rev.WRC‑07)

The Bureau organized in Geneva three ITU Inter-regional Workshops on WRC‑19 preparation, the first one on November 2017, the second one on November 2018 and the third one on September 2019.

See details at <https://www.itu.int/en/ITU-R/conferences/wrc/2019/irwsp/Pages/default.aspx>.

Staff of the Bureau also participated regularly in WRC‑19 preparatory meetings of regional organizations, providing information and assistance as necessary.

## 1.3 ITU-R Study Groups work for WRC‑19

This activity is reported in Section 4.3 below.

# 2 Application of the Radio Regulations for Spaces services

## 2.1 Introduction

In the period since WRC‑15 there has been a continuing heavy workload for the Space Services Department in processing notices for non-planned services (Advance Publication, Coordination requests and Notification for entry into the Master Register), including the implementation of WRC‑15 decisions (in particular Resolution **31 (WRC-15)**, Resolution **40 (WRC-15)**, Resolution **155 (WRC-15)**, Resolution **552 (Rev.WRC‑15)**, Resolution **553 (Rev.WRC‑15)**, Resolution **907 (Rev.WRC-15)** and Resolution **908 (Rev.WRC-15)**). Similarly, in respect of services subject to Plans, the Radiocommunication Bureau has undertaken substantial work since WRC‑15.

During this period, the objective to meet the regulatory deadlines set up in the Radio Regulations for processing satellite network filings has generally been achieved in the treatment of all procedures: advance publication of information, coordination requests and notification and recording in the Master Register for non-planned satellite network services, use of guardbands, modifications or additional uses and notification and recording of frequency assignments to the broadcasting-satellite service and associated feeder links subject to a Plan (**AP30/30A**) and conversion of allotments, introduction of additional systems, modification and recording of frequency assignments to the fixed-satellite service subject to a Plan (**AP30B**). During the period since WRC-15, two events principally caused delays in the processing of satellite filings: the simultaneous submissions of numerous satellite notices with a formal date of receipt on 1st January 2017 (date of entry into force of the Final Acts of WRC-15) on the one hand, the submissions of exceptionally large geostationary satellite filings on the other hand. As instructed by Council at its 2019 session, more information on exceptionally large geostationary satellite filings may be found in section 2.11.2 below.

To ensure that regulatory deadlines set up in the Radio Regulations for processing satellite network filings continue to be met and that processing backlog situations will not reoccur, staff resources and work have been continuously adapted to the requirements. Following Council 2017 decision to instruct the Director of the Bureau to take urgent measures to restore staffing levels in the Bureau, three additional engineers have been recruited to process satellite network filings.

Full details of these situations are contained in the following paragraphs.

## 2.2 Processing of notices: non-planned services

Access to spectrum/orbit resources that are not subject to a Plan is governed by procedures laid down in Articles **9** and **11** of the Radio Regulations. Two main procedures are contained in these Articles:

• satellite systems not subject to coordination submit Advance Publication Information (API) and Notification information,

• satellite systems subject to coordination submit Coordination Request (CR) and Notification information.

These procedures constitute a cooperative system, where ITU Member States collaborate to allow satellite systems to operate in space free from radio interference. This cooperative system can broadly be characterized by three main steps:

1) An ITU Member State sends a description (contained either in an API or a CR) of the radio frequencies planned to be used in a satellite project. The Bureau then examines the conformity of this description with the Radio Regulations and publishes the description and the Bureau’s findings in Special Sections contained in BR IFIC so that all other ITU Member States can examine this project.

2) Those other Member States considering that this project may affect their existing systems, or those planned and already submitted to the Bureau, contact the initiating ITU Member State in order to bilaterally discuss technical solutions to ensure that both systems can coexist without interfering to each other. During these bilateral discussions, “the requesting and responding administrations shall make every possible mutual effort to overcome the difficulties, in a manner acceptable to the parties concerned” (see No. **9.53**). The Rules of Procedure on No. **9.6** provide further clarifications about the meaning and purpose of No. **9.53**:

a) “the intent of Nos. **9.6** (**9.7** to **9.21**), **9.27** and Appendix **5** is to identify to which administrations a request for coordination is to be addressed, and not to state an order of priorities for rights to a particular orbital position”;

b) “the coordination process is a two way process”; and

c) “in the application of Article **9**, no administration obtains any particular priority as a result of being the first to start either the advance publication phase (Section I of Article **9**) or the request for coordination procedure (Section II of Article **9**)”.

3) The legal rights are derived from the notification of frequency assignments and their recording in the MIFR based on the outcome of the abovementioned bilateral discussions (see No. **8.1**, “the international rights and obligations of administrations in respect of their own and other administrations’ frequency assignments (…) shall be derived from the recording of those assignments in the Master International Frequency Register (the Master Register) or from their conformity, where appropriate, with a plan. Such rights shall be conditioned by the provisions of these Regulations and those of any relevant frequency allotment or assignment plan.” and No. **8.3** “Any frequency assignment recorded in the Master Register with a favourable finding under No. **11.31** shall have the right to international recognition. For such an assignment, this right means that other administrations shall take it into account when making their own assignments, in order to avoid harmful interference. In addition, frequency assignments in frequency bands subject to coordination or to a plan shall have a status derived from the application of the procedures relating to the coordination or associated with the plan.”). In order to avoid spectrum warehousing, a time limit of 7 years is set to notify and bring into use frequency assignments to space services.

This cooperative system is often referred as “first-come-first-served” but it should be noted that this expression tends to oversimplify the actual system, which relies on a “first-come-first-served” approach only for the identification of the satellite networks with which a newcomer has to discuss/coordinate. When envisaged as a complete set, the procedures contained in Articles **9** and **11** of the Radio Regulations for the space systems strike a balance between the rights and obligations of incumbents and newcomers.

Article **11** also contains provisions to address cases where the discussions initiated following the application of Article **9** have not yet been concluded at the time of notification (see Nos. **11.32A** and **11.41**). Here again, they are based on a balance between the rights and obligations of both the incumbent administration and the new administration. For example, the operations of a satellite recorded under No. **11.41** are subject to regulatory conditions set forth in No. **11.42** (i.e. immediate elimination by the new administration of any harmful interference originating from its system) but they are balanced by the requirement for the incumbent administration to provide the particulars relating to the harmful interference (i.e. to gather evidence supporting its claim of an harmful interference event). It should be noted that, while this regulatory framework applies to both geostationary and non-geostationary satellite systems, spectrum monitoring techniques may be more complex in cases involving non-geostationary satellite systems.

This section provides information about the implementation of these procedures by the Bureau.

### 2.2.1 Advance publication information (API)

2.2.1.1 API treatments include mainly the examination, validation, data preparation and publication of theSpecial Sections (API/A) in BR IFIC of information received on satellite networks under Article **9**, Subsection IA; and the API/A Special Sections SUP or MOD as a follow-up to the application of No. **11.44**, No. **11.44.1**, Resolution **49**, No. **9.2B.1** and No. **9.38.1**, No. **13.6**.

After publication of API/A Special Sections, it also includes the treatment of comments submitted under No. **9.3** which are subsequently published in Special Sections API/B.

Following the changes to the provisions relating to API adopted at WRC-15 (No. **9.1**, Resolution **31**, etc.), with effect from 1 July 2016, API are no longer submitted for satellite networks subject to coordination. Consequently the API/A special sections that are received and published by the Bureau concerned only those satellite networks not subject to coordination.

#### 2.2.1.2 Treatment time in the processing of requests for API

****

The above Figure shows the statistics on the treatment time in the processing of requests for API in the 2015-2019 period. These statistics are regularly updated and the latest version may be found at: <http://www.itu.int/en/ITU-R/space/Pages/Statistics.aspx>.

#### 2.2.1.3 Treatment of API/C

Under RR No. **9.1A**, the Bureau shall publish a general description of the satellite network or system for advance publication in a Special Section of the BR IFIC based on information sent under RR No. **9.30**. The Bureau currently publishes these information for the satellite network or system whose notice are submitted on and after 1st January 2017 in an API/C special section.

The Bureau published 255 API/C special sections in 2017, 323 in 2018 and 211 until July 2019.

#### 2.2.1.4 Resolution 31 (WRC-15)

In accordance with *resolves* 1 of Resolution **31 (WRC-15)**, the submission of APIs for satellite networks subject to the coordination procedures in Section II of Article **9** was ceased from 1 July 2016. Consequently, 95 coordination requests received between 1.7.2016 and 31.12.2016 not covered by a previous API/A special sections were all published with a date of receipt of 1.1.2017.

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.

### 2.2.2 Coordination requests (CR)

**2.2.2.1** CR treatments include the processing of coordination request information submitted to the Bureau under Article 9 and relevant resolutions and appendices of the Radio Regulations, i.e. data preparation, validation, examination (establishment of findings concerning compliance with Radio Regulations, applicable forms of coordination and coordination requirements) and publication of CR/C special sections, the update of databases made available to administrations on the ITU website and correspondence/assistance to administrations. After publication of CR/C Special Sections, it also includes the treatment of requests under No. 9.41 which are subsequently published in Special Sections CR/E and, in accordance with No. **9.53A**, processing of comments under No. 9.52 concerning coordination requests under Nos. **9.11** to **9.14** and **9.21** (Special Section CR/D).

#### 2.2.2.2 Treatment time in the processing of requests for coordination



The above Figure shows the statistics on the treatment time in the processing of coordination requests in the 2015-2019 period. These statistics are regularly updated and the latest version may be found at: <http://www.itu.int/en/ITU-R/space/Pages/Statistics.aspx>.

#### 2.2.2.3 Resolution 553 (Rev.WRC-15)

Pursuant to Resolution **553 (Rev.WRC-15)**, as of 18 February 2012, the special procedure outlined in the Attachment to the Resolution for processing of coordination request for BSS frequency assignments in Regions 1 and 3 in the 21.4-22 GHz band has been applied in respect of submissions of administrations meeting the requirements specified in the Attachment.

Up to now, the Bureau has received only two requests, both in 2012, to apply the Special Procedure under this Resolution and has processed them. The list of satellite networks for which a request for the special procedure under Resolution **553 (Rev.WRC-15)** has been received by the Bureau is made available to administrations on the ITU-R website (<https://www.itu.int/ITU-R/go/space-res553>). The frequency assignments of one of these satellite networks have not been notified nor brought into use within the 7-year regulatory period and will be cancelled under No. 11.48 of the Radio Regulations.

No case of request for applying the special procedure contained in Resolution **553 (Rev.WRC-15)** was received after WRC-15.

For coordination requests received after 01.01.2017, frequency assignments in the band 21.4-22 GHz are published in a CR/C publication and no longer separately from the other bands. However, frequency assignments meeting the specified requirements for the special procedure in Resolution **553 (Rev.WRC-15)** continue to be separately published in a CR/F publication.

### 2.2.3 Notification for recording in the Master Register

**2.2.3.1** Tasks related to processing of notification information submitted to the Bureau under Article 11 and relevant resolutions and appendices of the Radio Regulations include the validation, publication of the information in Part-IS of BR IFIC, examination (data comparison, analysis, establishment of Findings), recording in the MIFR and publication in Part-IIS or -IIIS of BR IFIC, including the update of databases made available to administrations on the ITU website and correspondence/assistance to administrations. Also part of this activity is the implementation of regulatory deadlines and further actions in order that the Bureau and administrations do not take into account those assignments for which notification under Article 11 has not been received or were not brought into use within the regulatory period as stipulated in Resolution 49 and in the provisions of Nos. l1.44/11.44.1 and corresponding Rules of Procedure.

#### 2.2.3.2 Treatment time in the processing of space stations notifications



The above Figure shows the statistics on the treatment time in the processing of notification requests of satellite networks in the 2015-2019 period. These statistics are regularly updated and the latest version may be found at: <http://www.itu.int/en/ITU-R/space/Pages/Statistics.aspx>.

##### 2.2.3.2.1 Implementation of Nos. 11.41A and 11.41B

Nos. **11.41A** and **11.41B** specify the conditions for reviewing the findings of an assignment recorded under No. **11.41** due to a change of coordination status. As reported in Circular Letter CR397 of 8 April 2016, the Bureau has fully implemented No. **11.41A** for all first notification notices received as of 1 January 2015. The list of frequency assignments to satellite networks which were the basis of unfavorable finding under No. **11.32A** to a recorded assignment under No. **11.41**, is kept with the notice of the recorded assignment and will be updated whenever these frequency assignments are suppressed.

##### 2.2.3.2.2 Consolidation of frequency assignments in the MIFR of different GSO networks

There has been one case where the administration has requested for consolidation of frequency assignments in the MIFR of different GSO networks. This request has been processed and published in accordance with the relevant Rules of Procedure, and a cost recovery invoice has been issued according to Council Decision 482.

#### 2.2.3.3 Treatment time in the processing of earth station notifications



The above Figure shows the statistics on the treatment time in the processing of notification requests of earth stations in the 2015-2019 period. These statistics are regularly updated and the latest version may be found at: <http://www.itu.int/en/ITU-R/space/Pages/Statistics.aspx>.

#### 2.2.3.4 Resolution 4 (Rev.WRC‑03)

In accordance with Resolution 4 (Rev.WRC-03), the period of validity of a frequency assignment can be extended and the revised period of validity is published in a Special Section RES4 of the Bureau’s International Frequency Information Circular (BR IFIC).

After the expiry of the period of validity of the frequency assignments, in accordance with *resolves* 1.1 of Resolution 4, the Bureau shall invite the notifying administration to cancel the corresponding frequency assignments, if the Bureau has not been informed of the wish of the administrations to extend the original period of operation under *resolves* 1.2 of the same resolution. If no reply is received within three months, the Bureau shall insert a symbol in the Remarks Column of the Master Register to indicate that the assignments are not in conformity with this Resolution.

Table 2.2.3.4-1

Statistics on Resolution 4

|  |
| --- |
| Number of RES 4 publications by year |
| 2010 | 33 |
| 2011 | 51 |
| 2012 | 66 |
| 2013 | 67 |
| 2014  | 57 |
| 2015 | 37 |
| 2016 | 34 |
| 2017 | 37 |
| 2018 | 43 |
| 07.2019 | 45 |
| Total number of networks recorded as not in conformity with RES 4 |
| As for 1st August 2019 | 8 |
| Period of validity recorded in the Master Register |
| Minimum  | 1 year |
| Maximum  | 99 years |
| Average  | 39 years |
| Extension requested by the administrations |
| Minimum | 1 year |
| Maximum | 79 years |

In line with Circular Letter CR/301 dated 1 May 2009 on the removal of unused satellite network frequency assignments from the MIFR, the Bureau has been sending since the 23 June 2011 a telefax to all administrations that did not reply after the expiry of the period of validity, asking them to provide, in accordance with the provisions of No. 13.6, evidence of continuous operation of the frequency assignments of the satellite network, or to remove these assignments from the MIFR in case some of them were discontinued. In the absence of information by the notifying administration on the evidence of the continuing use of frequency assignments beyond the recorded period of validity, the Bureau initiate the cancellation of the relevant MIFR entries in accordance with the provisions of No. 13.6 and the associated Rule of procedure.

#### 2.2.3.5 Resolution 762 (WRC-15)

Resolution **762 (WRC-15)** instructs the Director of the Radiocommunication Bureau to report to WRC-19 the results and any potential difficulties relating to the implementation of this Resolution.

This Resolution introduces new criteria to assess the potential for harmful interference under No. **11.32A** for fixed-satellite and broadcasting-satellite service networks in the 6 GHz and 10/11/12/14 GHz frequency bands not subject to a Plan based on power-flux density criteria.

In particular, No. **11.32A.2** establishes that new power-flux density criteria should be used for the application of No. **11.32A** with respect to the procedure for coordination under No. **9.7** in the frequency bands 5 725-5 850 MHz (Region 1), 5 850-6 725 MHz and 7 025‑7 075 MHz (Earth-to-space) for satellite networks having a nominal orbital separation in the geostationary-satellite orbit of more than 7°, and in the frequency bands 10.95‑11.2 GHz, 11.45-11.7 GHz, 11.7-12.2 GHz (Region 2), 12.2‑12.5 GHz (Region 3), 12.5‑12.7 GHz (Regions 1 and 3) and 12.7-12.75 GHz (space-to-Earth) and 13.75-14.5 GHz (Earth-to-space) for satellite networks having a nominal orbital separation in the geostationary-satellite orbit of more than 6°. For all other cases subject to coordination under No. **9.7**, the existing methodology defined in Part B, Section B3 of the Rules of procedures based on carrier to noise ratio criteria is used.

The Bureau has implemented Resolution **762 (WRC-15)** for GSO networks notifications received from 1.01.2017. Since the implementation of this Resolution, more than 50 networks were examined under No. **11.32A** at least partially using PFD-criteria established in Resolution **762 (WRC-15)**.

In addition and as reported in Part 2 of Director’s Report, the Bureau has experienced some difficulties for establishing calculation method when an incoming assignment is receiving interference from an existing assignment.

### 2.2.4 Other Resolutions associated with the processing of notices for non-planned services

#### 2.2.4.1 Resolution 85 (WRC‑03)

Resolution **85 (WRC-03)** requires the Radiocommunication Bureau to review, once the equivalent power flux-density (epfd[[1]](#footnote-1)) validation software is available, its findings made in accordance with Nos. **9.35** and **11.31** for frequency assignments to non GSO FSS satellite systems against the single-entry epfd limits in Tables 22-1A, 22-1B, 22-1C, 22-1D, 22-1E, 22-2 and 22-3 in Article **22** of the Radio Regulations, and to determine the coordination requirements under Nos. **9.7A** and **9.7B**.

In Circular Letter CR/414 (6 December 2016), the Bureau informed administrations of the availability of the final version of the software for implementing Recommendation ITU-R
S.1503-2 on the ITU website [www.itu.int/ITU-R/go/space-epfd/en](http://www.itu.int/ITU-R/go/space-epfd/en) and on the DVD version of BR IFIC (Space services). The purpose of the circular letter was also to provide 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)**.

As a follow up since April 2017, the Bureau has been individually contacting the administrations that 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 requested each of these administrations to submit the following information within three months from the date of dispatch of the communication:

– PFD and e.i.r.p mask data (data elements under § A.14 of Appendix **4**) in accordance with the detailed description of the masks in Recommendation ITU-R S.1503-2, Part B. The mask data should be submitted in XML format, the description of which can be found at www.itu.int/ITU-R/go/space-mask-XMLfile/en; and

– any other Appendix **4** data elements required for stations in a frequency band subject to Nos. **22.5C**, **22.5D** or **22.5F** (i.e. subject to epfd examination) which may have been missing in the original submissions or may require amendment in order to run the epfd validation software correctly along with the pfd/e.i.r.p mask data.

In accordance with *instructs the Director of the Radiocommunication Bureau* 2 and 3 of Resolution **85 (WRC-03)**, the Bureau initiated a review of its findings pursuant to the relevant provisions of the Radio Regulations and the Radio Regulations Board’s Rule of Procedure.

Examination process and support activities

Taking account of the complexity of the verification of compliance with the limits of Article **22** and the building of its own experience to run the epfd validation tools, the Bureau approached this review with an open, constructive and pragmatic spirit to ensure to the maximum extent possible a fair development and implementation of the non-GSO FSS constellations without jeopardizing the existing terrestrial and GSO satellite projects, and also to ensure that the information recorded in the MIFR for the non-GSO FSS constellations properly describes the real systems.

To address this situation, the following elements were introduced in examination process.

1) The Bureau provides a 90-day period to submit missing or updated information required for RR Article **22** examination;

2) In cases where such information (pfd/e.i.r.p. masks or other required information) was already received at the time of initial submission of notification or coordination request data, the Bureau nevertheless requests to submit the data within 90-days period in accordance with CR/414 while accepting modification of initially submitted data (notably pfd/e.i.r.p. masks, GSO arc exclusion zone method and angle, density of earth stations, operational latitudes).

 Update of information was on condition that updated parameters are only required for RR Article **22** examination and are not listed in RR Appendix 4 as mandatory information required to be submitted in coordination requests;

3) Following a suggestion from ITU-R Working Party 4A (see Annex 51 to Document 4A/519), the Bureau developed a draft modification to the Rules of procedure on No. **9.27** which was subsequently reviewed and adopted by RRB at its 78th Meeting (16-20 July 2018). This modification permits administrations to modify previously submitted data required for Article **22** examination. As the modified parameters are not used for coordination between non-GSO networks or systems, the modified frequency assignments will retain D1 as their “2D‑Date” provided that:

a) the previous assignments received favourable findings under No. 11.31 with respect to Article 22;

b) the modified assignments received a favourable finding under No. 11.31 with respect to Article 22 using the latest version of the epfd validation software;

c) the modified assignments, in case that they are subject to No. 9.7B, retain D1 as their “2D‑Date” in accordance with §§ 2.3 to 2.3.2 of Rule of procedure on No. 9.27.

4) Considering the significant simulation time (billions of time-steps) for examination under No. **9.7B** for systems with large number of satellites and/or employing orbits without repeating ground track, the Bureau, in order to facilitate review under No. **9.35/11.32**, continues to publish coordination requirements under No. **9.7B** based on frequency-overlap only until examination under No. **9.7B** using epfd trigger limits is completed.

In addition, the Bureau established support activities using epfd community forum and dedicated support e-mail epfd-support@itu.int. Significant number of requests of assistance coming not only from administrations but also from academia, industry and operators were responded using these means.

Implementation of WRC-15 decision

The 2015 World Radiocommunication Conference (WRC-15) reviewed the progress reported by the Director of BR regarding the development of the epfd validation software, and at its eighth plenary meeting approved the second report of Committee 5 to the Plenary Meeting (see Documents CMR15/416 and CMR15/505) indicating that:

 *“In cases where the software cannot adequately model certain non-geostationary satellite FSS systems, Resolution****85*** *(WRC-03) will continue to be applied until an update to Recommendation ITU-R S.1503 improving the modelling of those non-GSO systems has been agreed within ITU‑R and has been implemented in the epfd validation software. This would not preclude the Bureau to undertake verification of the non-GSO FSS systems that can be modelled with the existing version of the software.”*

In accordance with the above decision, the Bureau, upon receipt of an indication that the software cannot adequately model a particular non-geostationary satellite FSS system, refers the case to ITU-R Study Group 4/Working Party 4A for consideration as to whether further improvements to the Recommendation ITU-R S.1503-2 methodology are required in order to model the system adequately. To support this review by the Bureau and Study Group 4/Working Party 4A, further detailed technical description shall be provided, including *inter alia*:

1) the results of calculations using existing EPFD validation software;

2) the results of EPFD calculations using simulation software with adequate modelling of the non-geostationary system;

3) identification of particular areas of Recommendation ITU-R S.1503-2 that need to be reviewed and improved.

Study Group 4 reviewed several cases, mainly related to the fact that Recommendation ITU-R S.1503-2 may not precisely model systems with steerable beams and considered a new revision of this Recommendation, which resulted in the adoption of Recommendation ITU-R S.1503-3.

The Bureau is currently considering procuring a new version of the epfd validation software implementing Recommendation ITU-R S.1503-3.

ITU Council at its 2019 session considered and approved the recommendation that “Council discuss the costs associated with software updates related to epfd examination during the approval of future biennial budgets (…)” (see § 2.2.24 of [Document C19/120](https://www.itu.int/md/S19-CL-C-0120/en)).

Summary for the findings review process

Reviews of findings for satellite networks under Resolution **85 (WRC-03)** started to be published in BR IFIC 2862 of 23.01.2018.

As of mid-2019, reviews of findings were carried out with respect to 30 non-GSO networks/systems with the following results:

• twenty three obtained complete favourable findings,

• one obtained unfavourable findings,

• three obtained favourable findings except for several frequency assignments that received unfavourable findings,

• three obtained favourable findings for some groups of frequency assignments and qualified favourable findings for some other groups and/or orbital configurations due to the continuous application of Resolution **85 (WRC-03)** on request by the notifying administration, as decided by WRC-15 (see Circular Letter [CR/414](https://www.itu.int/md/R00-CR-CIR-0414/en)).

In addition to the above cases:

• two non-GSO systems were suppressed and another two were partially suppressed due to missing data required for EPFD examination

• one non-GSO system is pending confirmation for continuing application of Resolution 85 (WRC-03).

It should be noted that several systems consist of up-to 10 mutually exclusive orbit configuration, which required individual examination of each orbital configuration and eventually led to extensive examination time.

Progress of the process to review these findings is regularly reported to the Radio Regulations Board.

#### 2.2.4.2 Resolution 552 (Rev.WRC-15)

WRC-15 revised Resolution **552** **(Rev.WRC-15)** on “Long-term access to and development in the band 21.4-22 GHz in Regions 1 and 3”, which requests administrations to provide certain specific information for geostationary-satellite networks in the BSS in the 21.4-22 GHz band and the Bureau to report to future competent World Radiocommunication Conferences the results of the implementation of this Resolution.

The number of submissions received by the Bureau under this Resolution between 2015-2019 are shown in the table below:

|  |  |
| --- | --- |
| YEAR | NUMBER OF SUBMISSIONS |
| 2015 | 1 |
| 2016 | 7 |
| 2017 | 0 |
| 2018 | 1 |
| 2019 | 3 |

#### 2.2.4.3 Resolution 155 (WRC‑15)

Resolution **155 (WRC-15)** deals with regulatory provisions related to earth stations on board unmanned aircraft (UA) which operate with geostationary satellite networks in the fixed-satellite service in certain frequency bands not subject to a Plan of Appendices **30**, **30A** and **30B** for the control and non-payload communications (CNPC) of unmanned aircraft systems in non-segregated airspaces.

In response to *resolves* 16 and *invites ITU-R*, ITU-R Working Party 5B has initiated the development of two new Reports ITU-R M.[UAS CNPC\_CHAR] and M.[UA\_PFD] (see Annexes 5 and 7 of Document [5B/712](https://www.itu.int/md/R15-WP5B-C-0712/en) respectively). Progress on the work has started slowly but as the level of co-operation improves so has progress.

Pursuant to the instructions contained in this Resolution, the Bureau has taken the following actions:

– In response to *instructs the Director of the Radiocommunication Bureau* 1, Circular Letter [CR/407](https://www.itu.int/md/R00-CR-CIR-0407/en) dated 5 July 2016 has provided administrations with information and guidance on different aspects of Resolution **155 (WRC-15)**;

– In response to *instructs the Director of the Radiocommunication Bureau* 3, the Bureau defined a new class of station **UG** – “Earth station on board unmanned aircraft communicating with a space station of a geostationary-satellite network in the fixed-satellite service for the control and non-payload communications of unmanned aircraft systems in non-segregated airspaces in the frequency bands under *resolves* 1 of Resolution **155 (WRC-15)**” (see Table 3 in the Preface to the BR IFIC (Space Services)) and updated the Bureau’s software accordingly;

– In order to assist the relevant ITU-R studies and in line with *resolves to encourage administrations* 1, the Bureau established a web-based platform for the posting, for information only, of the part of notices “as received” under RR Articles **9** or **11** for FSS networks for UAS CNPC links or an earth station on board UA communicating with a GSO FSS space station at: <https://www.itu.int/en/ITU-R/space/snl/Pages/UAS.aspx>. To date the Bureau received 40 coordination requests from 6 administrations containing class of station UG (note should be taken that these parts of notices are removed before the computation of the final cost recovery fees of the submitted notices, therefore, cost recovery fees related to these parts will be charged when they are treated, following the completion of the provisions of Resolution **155 (WRC-15)** byWRC-23);

– In response to *instructs the Director of the Radiocommunication Bureau* 4, the Bureau has not processed any satellite network submissions with class of station **UG**, awaiting full implementation of *resolves* 1-12 and 14-19 of the Resolution;

– In response to *instructs the Director of the Radiocommunication Bureau* 5, the BR asked ICAO about the current status of the related SARPs development. In its reply (see document [5B/566](https://www.itu.int/md/R15-WP5B-C-0566/en)), ICAO informed the Director of the Bureau on the progress made on the development of SARPs for UA system CNPC links.

ICAO also began the development of specific requirements to FSS links and requested ITU to provide the information about the characteristics of UAS satellite links using FSS. ICAO also stated that in the absence of the required information, it could determine the required protection criteria without the involvement of ITU-R.

WITU-R Working Party 5B started to work on such characteristics in 2016. The Bureau has first reviewed the related ITU-R Recommendations and compiled the satellite network characteristics received and the results of this review have been provided to ITU-R Working Party 5B (see [Document 5B/243](https://www.itu.int/md/R15-WP5B-C-0243/)). Upon request of Working Party 5B, the Bureau has provided a list of satellite networks that fully meet the criteria described in the draft Working Party 5B guidelines for the implementation of Resolution **155 (WRC-15)** and established the list of characteristics of these networks to be used in further studies. The Bureau provided the required information to the November 2018 meeting of Working Party 5B. The Bureau has also suggested some data elements to consider the envelopes of characteristics of satellite networks (see Documents [5B/441](https://www.itu.int/md/R15-WP5B-C-0441/en) and [5B/578](https://www.itu.int/md/R15-WP5B-C-0578/en)).

The information prepared by the Bureau was forwarded to ICAO by Working Party 5B on 16 November 2018. Working Party 5B believed that that information could help ICAO with its task of developing SARPs for UAS when using the FSS networks.

#### 2.2.4.4 Resolution 222 (Rev. WRC-12)

Resolution **222 (Rev.WRC-12)** “Use of the frequency bands 1 525-1 559 MHz and 1 626.5‑1 660.5 MHz by the mobile-satellite service, and procedures to ensure long-term spectrum access for the aeronautical mobile-satellite (R) service” establishes procedure for spectrum requirements coordination process between the notifying administrations of MSS, including AMS(R)S to fulfil spectrum requirements of different AMS(R)S systems in the bands 1 525‑1 559 MHz and 1 626.5-1 660.5 MHz.

This procedure also considers the possibility for calling out a Reassessment Meeting in case of AMS(R) spectrum requirements are not fulfilled. According to Resolution 222 (Rev. WRC-12) the Bureau may be invited to a Reassessment Meeting and to publish the report of that meeting.

The Bureau has no information regarding any Reassessment Meetings held so far and has not received any invitation or request for assistance in this regard.

## 2.3 Processing of notices: planned services

### 2.3.1 Appendices 30 and 30A

**2.3.1.1** Tasks under both appendices comprise the examination and publication of submissions under Articles **2A**, **4** and **5** of Appendices **30** and **30A** (BSS and associated feeder-link Plans), taking also due account of Resolutions **49 (Rev.WRC‑15)** and **548 (WRC‑12)**. Under Article **4**, the Bureau processes requests for modifications to the Region 2 Plan, and proposed new or modified assignments in the Regions 1 and 3 Lists, submitted by administrations. The characteristics and list of administrations whose frequency assignments are considered to be affected are published in Part A of a Special Section in BR IFIC. New or modified assignments entered in the Regions 1 and 3 List or Region 2 Plan as a result of the successful application of the provisions of Article **4** are then published in Part B of a Special Section. The above processing entails acknowledgement of received information, validation, examination and publication of relevant Special Sections, including application of Resolution **49**, Decision 482 invoicing, correspondence/assistance to administrations, processing of comments (publication of a list of administrations whose agreements are required in Part D of a Special Section) and the update of databases made available to administrations on the ITU website and in BR IFIC. The Bureau processes notifications submitted under Article **5** of these appendices for recording in the Master International Frequency Register, i.e. data acknowledgement, validation, publication of the information in Part I-S of BR IFIC, technical examination (establishment of Findings) and publication in Part II-S or III-S of BR IFIC, recording in the MIFR, including the update of databases made available to all administrations on the ITU website and in BR IFIC. The Bureau also processes requests for coordination of assignments for space operation functions in the guardbands submitted under Article **2A** of these appendices, i.e. data capture, validation, examination and publication of a Special Section in BR IFIC.

#### 2.3.1.2 Treatment time in the processing of requests for AP30-30A (Article 4 Part A)

 

The above Figure shows the statistics on the treatment time in the processing of requests for the application of Article **4** of Appendices **30/30A** in the 2015-2019 period. These statistics are regularly updated and the latest version may be found at: <http://www.itu.int/en/ITU-R/space/Pages/Statistics.aspx>.

#### 2.3.1.3 Resolution 547 (Rev.WRC‑07)

WRC-15 suppressed Resolution **547 (Rev.WRC‑07)** “Updating of the “Remarks” columns in the Tables of Article **9A** of Appendix **30A** and Article **11** of Appendix **30** of the Radio Regulations” as the assignments of the affected or affecting networks, terrestrial stations or beams of administrations remaining in the Tables 2, 3 and 4 of Article **11** of Appendix **30** and in Tables 1A and 1B of Article **9A** of Appendix **30A** either have already been recorded in the Master International Frequency Register and brought into use, or included in the original Region 2 Plan and therefore the status and characteristics of these assignments will normally remain unchanged.

However, the Bureau received a correspondence from the Administration of Russian Federation confirming that coordination between the RUS-4 Plan beam with the AM-SAT A4 network of the Administration of United Kingdom of Great Britain and Northern Ireland was completed. The Administration of Russian Federation requested to update that Table 2 to reflect the coordination status as indicated below.

TABLE 2   (WRC‑19)

Affected administrations and corresponding networks/beams identified based on Note 5 in § 11.2 of Article 11

| Beam name | Channels | Ref.Table 1 | Affected administrations\* | Affected networks/beams\* |
| --- | --- | --- | --- | --- |
| RUS-4 | 28, 29, 33, 37 | c | KOR | KOREASAT-1, KOREASAT-2 |
|  |  |  |  |  |
| \* Administrations and corresponding networks/beams whose assignment(s) may receive interference from the beam shown in the left-hand column. |

**The Conference is invited to update Table 2 of Article 11 of Appendix 30 accordingly.**

#### 2.3.1.4 Resolution 556 (WRC-15)

In accordance with Resolution **556 (WRC-15)** all analogue assignments included in Article **9A** of Appendix **30A** and Article **11** of Appendix **30** and in the Regions 1 and 3 Lists shall be converted to digital assignments as from 1 January 2017. The Bureau implemented the requested conversion in BR IFIC 2836 of 10 January 2017.

**As the conversion concerns certain analogue assignments in the Regions 1 and 3 Plans as listed in the table below, the Conference is invited to update Table 6A of Article 11 of Appendix 30 and Tables 3A1, 3A2 of Article 9A of Appendix 30A accordingly.**

| Plan | Admin.symbol | Beamidentification | Orbitalposition | Designation of emission | Changed to | Table |
| --- | --- | --- | --- | --- | --- | --- |
| R1&3 Downlink Plan | E | HISPASA4 | −30.00 | 27M0F8W | 27M0G7W | Table 6A |
| J | 000BS-3N | 109.85 | 27M0F8W | 27M0G7W |
| J | J 1110E | 110.00 | 27M0F8W | 27M0G7W |
| KOR | KOR11201 | 116.00 | 27M0F8W | 27M0G7W |
| RUS | RSTREA11 | 36.00 | 27M0F8W | 27M0G7W |
| RUS | RSTREA12 | 36.00 | 27M0F8W | 27M0G7W |
| R1&3 14 GHz Feeder-link Plan  | KOR | KOR11201 | 116.00 | 27M0F8W | 27M0G7W | Table 3A1 |
| R1&3 17 GHz Feeder-link Plan  | E | HISPASA4 | −30.00 | 27M0F8W | 27M0G7W | Table 3A2 |
| E | HISPASA6 | −30.00 | 27M0F8W | 27M0G7W |
| J | 000BS−3N | 109.85 | 27M0F8W | 27M0G7W |
| J | J 1110E | 110.00 | 27M0F8W | 27M0G7W |
| RUS | RSTREA11 | 36.00 | 27M0F8W | 27M0G7W |
| RUS | RSTREA12 | 36.00 | 27M0F8W | 27M0G7W |

#### 2.3.1.5 Equivalent protection margin (EPM) and overall equivalent protection margin (OEPM) values for the assignments in the Appendices 30 and 30A Plan

A summary of the change in the reference situation (EPM) of the Regions 1 & 3 Plan Beams contained in Appendices **30** and **30A** is provided at <http://www.itu.int/en/ITU-R/space/plans/Pages/AP30-30A.aspx>.

### 2.3.2 Appendix 30B

**2.3.2.1** The processing tasks under this Appendix include the examination and publication of submissions under Articles **6**, **7** and **8** of Appendix **30B**. Article **6** of Appendix **30B** and its related Rules of Procedure provide the procedures for the conversion of an allotment into an assignment, for the introduction of an additional system and for the modification of an assignment in the List. The characteristics of the satellite network and list of administrations whose frequency assignments are considered to be affected are published in a Special Section AP30B/A6A in BR IFIC. New or modified assignments entered in the List as a result of the successful application of the provisions of Article **6** are then published in a Special Section AP30B/A6B. The above processing entails data capture of received information, validation, examination and publication of relevant Special Sections, including application of Resolution **49**, invoicing according to Council Decision 482, correspondence/assistance to administrations, processing of comments and the update of databases made available to administrations on the ITU website and in BR IFIC. Article **7** of the Appendix **30B** and its related Rules of Procedure regulate addition of a new allotment to the Plan for a new Member State of the Union. Article **8** and its related Rules of Procedure cover the notification procedure. The Bureau processes notifications submitted under Article **8** for recording in the Master International Frequency Register, i.e. data capture, validation, publication of the information in Part I-S of BR IFIC, technical examination (establishment of findings) and publication in Part II-S or III-S of BR IFIC, recording in the MIFR, including the update of databases made available to all administrations on the ITU website and in BR IFIC.

Following a request from the Radiocommunication Advisory Group, statistics on the notices of satellite networks submitted under § 6.1 of Article 6 of RR Appendix 30B over the period 2012 – 2019 are presented in Annex 1.

#### 2.3.2.2 Treatment time in the processing of requests for AP30B



The above Figure shows the statistics on the treatment time in the processing of requests for the application of Articles **6** and **7** of Appendix **30B** in the 2015-2019 period. These statistics are regularly updated and the latest version may be found at: <http://www.itu.int/en/ITU-R/space/Pages/Statistics.aspx>.

#### 2.3.2.3 Resolution 148 (WRC‑07)

There is nothing to report for the period 2015-2019 in relation to Resolution **148** (WRC-07) –Satellite systems formerly listed in Part B of the Plan of Appendix **30B (WARC Orb-88)**.

#### 2.3.2.4 Resolution 149 (Rev.WRC‑12)

There is nothing to report for the period 2015-2019 in relation to Resolution **149 (Rev.WRC‑12)** – Submission from New Member States of the Union relating to Appendix **30B** of the radio Regulations.

#### 2.3.2.5 Reference situation for the allotment of Appendix 30B

The current reference situation values for all allotments in the FSS Plan is provided at <http://www.itu.int/en/ITU-R/space/plans/Pages/AP30B.aspx>]

## 2.4 Special assistance on coordination, notification and Plans

### 2.4.1 Assistance cases for non-planned services

**2.4.1.1** Due to the requirement to notify assignments within the 7-year period, administrations increasingly rely on the regulatory assistance by the Bureau under Sub-Sections IIB and IID of Article **9** to complete or continue coordination in cases of non-reply or objections without details concerning the assignments that are the reason for objection. Between January 2016 and June 2019, the number of requests for assistance handled were 330 for space stations and 654 for earth stations. The Bureau endeavours to deal with these cases as expeditiously as is consistent with the relevant procedure of Article **9**.

**2.4.1.2** In addition to the regulatory assistance described above, various provisions in the Radio Regulations (notably in Articles **7** and **13**) specify a wide range of possibilities for assisting administrations. This activity requires the identification of the nature of the assistance, identification of procedures and administrations involved and preparation of replies in a timely fashion. The Space Services Department is also involved in a number of contacts, on a daily basis, with many administrations, operating agencies, private companies and the general public which request assistance, support or clarification concerning the application of regulatory and administrative provisions of the Radio Regulations.

### 2.4.2 Assistance cases for Appendices 30, 30A and 30B

**2.4.2.1** The Bureau continued to provide assistance to administrations in application of Appendices **30**, **30A** and **30B** and Article **13** of the Radio Regulations including coordination and detailed information concerning the results of the Bureau’s calculations.

**2.4.2.2** The Bureau received many requests for information from various entities including Member States and Sector Members concerning application of these Appendices by e-mail and telephone. The requested information was provided as quickly as possible. Between December 2015 and June 2019, the Bureau also processed 92 formal assistance cases from administrations concerning the detailed results of the calculations performed by the Bureau or application of provisions of the Radio Regulations including those under § 6.13 of Article **6** of Appendix **30B** (see § 2.4.3 below) and under § 4.1.10a of Article **4** of Appendices **30/30A** (see § 2.4.4 below). The administrations were assisted as requested.

### 2.4.3 Request for assistance under § 6.13 of Article 6 of Appendix 30B

**2.4.3.1** Provision 6.13 of Article **6** of Appendix **30B** allows a notifying administration to request the Bureau to assist in respect of potentially affected administrations which have not made comments within four-month period to a network published under § 6.7 of Article **6** of that Appendix.

**2.4.3.2** Between December 2015 and June 2019, the Bureau has processed 20 requests for assistance under § 6.13. The Bureau has sent 121 reminders by telefax in accordance with §§ 6.14 and 6.14*bis* to administrations whose allotment(s)/assignments were identified as affected. Whenever an administration was not reachable by telefax, the reminders were sent through mail and e-mail. The Bureau received 37 replies with decisions from those administrations (including 7 replies received after the 30-day deadline), which is less than 31% of all reminders sent.

**2.4.3.3** Provision 6.15 of Article **6** of Appendix **30B** which states that “If no decision is communicated to the Bureau within thirty days after the date of dispatch of the reminder under § 6.14, it shall be deemed that the administration which has not given a decision has agreed to the proposed assignment” has been applied to those administrations who did not respond within the deadline.

### 2.4.4 Request for assistance under § 4.1.10a of Article 4 of Appendices 30/30A

**2.4.4.1** Provision 4.1.10a of Article **4** of Appendices **30/30A** allows a notifying administration to request the Bureau to assist in respect of potentially affected administrations which have not made comments within four-month period to a network published under § 4.1.5 of Article **4**.

**2.4.4.2** Up to June 2019, the Bureau has received only one request for assistance under § 4.1.10a. The Bureau has sent 78 reminders by telefax in accordance with §§ 4.1.10b and 4.1.10c to administrations whose assignments were identified as affected. Whenever an administration was not reachable by telefax, the reminders were sent through mail and e-mail. The Bureau received 15 replies with decisions from those administrations (including 2 replies received after the 30-days deadline), which is less than 20% of all reminders sent.

**2.4.4.3** Provision 4.1.10d of Article **4** of Appendices **30/30A** which states that “If no decision is communicated to the Bureau within 30 days after the date of dispatch of the reminder under § 4.1.10b, it shall be deemed that the administration which has not given a decision has agreed to the proposed assignment” has been applied to those administrations who did not respond within the deadline.

## 2.5 Resolution 40 (WRC-15)

Resolution **40 (WRC-15)** on the use of one space station to bring frequency assignments to geostationary-satellite networks at different orbital locations into use within a short period of time *instructs* the Radiocommunication Bureau to make available the information provided in *resolves* 1 and 2 on the ITU website within 30 days of its receipt.

During the period from 27 November 2015 to 30 June 2019, the Bureau received **412** submissions under the provisions of Resolution **40 (WRC-15)**. For **116** submissions, the bringing into use, or bringing back into use after suspension, has been accomplished with a space station that has previously been used to bring into use, or resume the use of, frequency assignments at a different orbital location within three years prior to the date of submission of this information, which represents about **28%** of the submissions.

**40** Administrations submitted information under Resolution **40** **(WRC-15)** and **25** Administrations indicated at least in one of their submissions that the bringing into use was accomplished with a space station that has previously been used to bring into use, or resume the use of, frequency assignments at a different orbital location within three years prior to the date of submission of this information.

The information gathered from the submissions under Resolution **40** **(WRC-15)** shows that satellites can be used to bring into use frequency assignments at multiple different orbital positions. There is an example of a satellite bringing into use, or bringing back into use after suspension, frequency assignments at 8 different orbital positions since 27 November 2015.

All information about the submissions received by the Bureau under Resolution **40 (WRC-15)** can be found on the following webpage: <https://www.itu.int/net/ITU-R/space/snl/sat_relocation/index.asp>.

At its 81st meeting (15 – 19 July 2019), the Radio Regulations Board instructed the Bureau to revise the webpage in order to include a search feature that would allow to extract statistics about the number of orbital locations sequentially brought into use with a single spacecraft. The Bureau is currently developing such a functionality.

## 2.6 Resolution 49 (Rev.WRC‑15) – Due diligence

### 2.6.1 Introduction

The activities undertaken by the Bureau pursuant to the requirements of Resolution **49 (Rev.WRC‑15)** are reported in this section in accordance with “*instructs the Director of the Radiocommunication Bureau*” wherein the Director of the Radiocommunication Bureau was required to report to future competent World Radiocommunication Conferences on the results of the implementation of the administrative due diligence procedure.

### 2.6.2 Changes made by WRC‑15

Consequential changes were made to this Resolution due to the modification of No. **9.1** of the Radio Regulations at WRC-15.

### 2.6.3 Implementation

**2.6.3.1** Six months before the beginning of each semester, the Bureau regularly sends to all administrations a circular telefax with a comprehensive list of networks with assignments whose deadlines fall in that semester, indicating the deadline applicable, and requesting the administrations to timely bring assignments into use, send the first notification and provide due diligence information (DDI), as appropriate. This information is also placed on the ITU‑R website to help administrations in case of non-receipt of the Circular Telegram sent by telefax or by mail. For planned services, individual reminders for satellite networks are sent to the notifying administration six months before the deadline.

**2.6.3.2** To help administrations to submit relevant, accurate and complete DDI and facilitate its own processing, the Bureau continues to maintain the Res49/552 builder within Spacecap. This software extracts frequency-band information from the coordination, notification of Plans modification data provided for a satellite network, the administrations select all or some of the extracted frequency bands at their choice, then capture only the DDI related to the spacecraft manufacturer and launch service provider, as appropriate. The software then links the DDI with all relevant groups of frequency assignments that use the selected frequency bands.

At the receipt of the DDI, the Bureau verifies that all the required information has been submitted, and that frequency bands are covered by a corresponding request for coordination. For cases where the information is unclear, the Bureau may request further information about the actual satellite in operation.

**2.6.3.3** After the expiry of the applicable deadline and in accordance with resolves 6 of Resolution **49 (Rev.WRC‑15)** and paragraph 11 of its Annex 1, the Bureau: i) informs the concerned administration of the list of satellite network(s) or frequency ranges for which the required DDI was not received by the Bureau before the regulatory expiry date; and ii) proceeds with cancellation of the related Special Sections and notification information or parts thereof, as the case may be, and publishes this information in BR IFIC.

### 2.6.4 Results of the process

The Due Diligence Information is published in RES49 Special Sections and made available to administrations in database format within one month of receipt of the submission. See details in the table below for the number of cases received and published.

Table 2.6.4-1

Implementation of Resolution 49 (Rev.WRC‑15)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Year | Due diligence received | Due diligence published | Cancellations(number of networks) |
|  | (number of networks) | (number of networks) | *resolves* 6 of Res. 49 |
| Planned/unplanned services | 2015 | 23/68 | 19/78 | 0/14 |
|   | 2016 | 25/81 | 27/68 | 1/25 |
|   | 2017 | 35/110 | 36/99 | 0/14 |
|   | 2018 | 34/48 | 30/66 | 15/11 |

## 2.7 Resolution 55 (Rev.WRC‑15)

Resolution **55 (Rev. WRC-15)** instructs the Bureau “to make available coordination requests and notifications (…) “as received” within 30 days of receipt on its website”. Since the implementation of the online application “e-submissions for Satellite Network Filing”, most notices have been made available within 7 days instead of 30 days. With all notices submitted through the online system, the Bureau has been able to extend the types of notices that are made available “as received” to include advance publication information of satellite networks not subject to coordination, earth station notification notices, as well as Part A, Part B special sections and notifications related to Appendices **30**, **30A** and **30B** of the Radio Regulations.

## 2.8 Resolution 609 (Rev.WRC‑07)

**2.8.1** Resolution 609 (Rev.WRC‑07) instructs the Radiocommunication Bureau to determine whether the pfd level in *recommends* 1 of Recommendation 608 (Rev.WRC‑07) is exceeded by any space station that is subject to this resolution, and to report the findings of this determination to the participants of the consultation meeting referred to under *resolves* 6 of the same resolution. *Instructs the Radiocommunication Bureau* 1 further charged the Bureau to participate to the consultation meetings and to observe carefully results of the epfd calculation mentioned in *resolves* 1.

**2.8.2** In order to help administrations and to comply with the above tasks, the Bureau is maintaining an up-to-date list of Articles **9** and **11** satellite network filings including RNSS frequency assignments in the 1 164-1 215 MHz band (as of 04.04.2019, this List contains 129 satellite network filings (CR/C or Part-I/II-S) representing 121 satellite networks from **25** administrations: 97 GSO /24 non-GSO). The Bureau also maintained a RES-609 (Rev.WRC‑07) webpage and forum at: [http://www.itu.int/ITU‑R/space/res609/](http://www.itu.int/ITU-R/space/res609/) for submission and exchange of information between the participants of the consultation meetings as well as for any administration interested in these meetings.

**2.8.3** Fifteen Resolution **609 (Rev.WRC‑07)** Consultation Meetings have been held so far (Geneva-2003, Ottawa-2004, Munich-2005, Bangalore-2006, Xi’an-2007, Correspondence Meeting-2009, Toulouse-2010, Geneva-2011, Tokyo-2012, Los Angeles-2013 Shenzhen-2014, by correspondence-2015, Auckland-2016, by correspondence-2017 and Abuja-2018) for which the Bureau has completed the required actions and published the results in its BR IFIC (the 16th Consultation Meeting will take place on 18-20 September 2019 in Cyberjaya, Malaysia). Based on the conclusions of the 15th Resolution **609 (Rev.WRC‑07)** Consultation Meeting the maximum aggregate epfd of satellites associated with the referenced RNSS networks and systems is determined to be no greater than **–121.89** dB(W/(m2·MHz)), i.e. 0.39 dB below the Resolution **609 (Rev.WRC-17)** limit of **–121.5** dB(W/(m2·MHz)). This result is based on the use of worst-case assumptions in terms of interference from RNSS into ARNS.

**2.8.4** The 15th Resolution **609 (Rev.WRC‑07)** Consultation Meetings encouraged the Bureau to continue contacting those administrations with RNSS filings in the 1 164-1 215 MHz band that have not until now participated fully or on a continuing basis to the Resolution 609 consultation process in an effort for these administrations to attend when appropriate to the consultation meeting, highlighting the mandatory nature of the Resolution **609 (Rev. WRC-07)** Consultation Meeting for those systems/administrations with concrete plans to operate RNSS systems in the 1 164-1 215 MHz band.

## 2.9 Resolution 907 (Rev.WRC‑15)

In response to the *instructs the Radiocommunication Bureau* of Resolution **907 (Rev.WRC-15)**, the Bureau has developed an online communication platform “e-Communications” to allow administrations to send and receive administrative correspondences related to Space Services through an online interface. This online application encompasses all types of administrative correspondence related to space services between administrations and the Bureau, as well as between administrations.

As informed in the circular letter CR/447, this application was available for beta testing by administrations until 30th September 2019.

Users could get access to this online application as well as a user’s guide at the following webpage within the BR space website: <https://www.itu.int/ITU-R/go/space-communications>.

Based on the results of the trial and feedback gathered from administrations, the Bureau will further improve the system, and put in place a production version of the application.

## 2.10 Resolution 908 (Rev.WRC-15)

In response to Resolution **908 (Rev.WRC-15)**, an online application “e-Submission for Satellite Network Filings” (e-Submission) has been developed to allow administrations to submit their satellite network filings or their comments related to a BR IFIC through an online interface without the need for emails or faxes. This online application encompasses all types of submissions related to satellite networks or systems.

The Bureau made the e-Submission application available for testing on 13 March 2018. Through circular letter CR/427, all administrations were invited to carry out tests and submit feedback to the Bureau.

Following successful testing by administrations, and further to the approval by the 78th meeting of the Radio Regulations Board (16 July – 20 July 2018) of revised and new rules of procedure (RoP) on the receivability of forms of notice, the Bureau sent out circular letter CR/434 to all administrations and released the operational version of the e-Submission application for submission of all filings for space services on 1 August 2018.

As from 1 August 2018, all filings under Articles **9** and **11**, Appendices **30**, **30A** and **30B** and Resolutions **49 (Rev.WRC-15)**, **552 (Rev.WRC-15)** and **553 (Rev.WRC-15)** in application of the procedures of the Radio Regulations, or comments related to a BR IFIC, were submitted exclusively using the e-Submission web interface available at <https://www.itu.int/itu-r/go/space-submission>. Upon receipt of a submission, an automatic acknowledgment is sent to the registered e-mail addresses of “Administration” and “Operator” users of the notifying administration for this application. The attention of Administrations was drawn to the fact that notices submitted using the e-Submission application do not require any separate confirmation by telefax or mail.

At the time of writing this report, 100 administrations and 1 intergovernmental satellite organisation (noting that other such organisation have chosen to be registered as satellite operator of their notifying administration) have registered, totalling 503 individual users.

The Bureau would like to take the opportunity of this report to renew its thanks to the Administration of Japan for the specific assistance in the development of this project.

## 2.11 Cost recovery for processing satellite network filings

## 2.11.1 Implementation of Council Decision 482

In accordance with Council Decision 482 (modified 2008), the Bureau has been issuing invoices for satellite network filings. The Bureau also tracks the payment status, sends reminder letters as appropriate, and cancels filings wherein the invoices are not received in accordance with the Council Decision. The implementation of Decision 482 (C-05), and subsequently Decision 482 (modified 2012), Decision 482 (modified 2013), Decision 482 (modified 2017), Decision 482 (modified 2018), and Decision 482 (modified 2019), by the Radiocommunication Bureau did not give rise to any administrative or operational difficulty either internally or with administrations notifying satellite network filings.

Since the entry into force of Decision 482 (modified 2018) on 1 July 2018, no coordination request of a non-geostationary satellite system including two or more mutually exclusive configurations has been received by the Radiocommunication Bureau.

Decision 482 was revised at Council session 2019 to address the case of complex/large non-GSO satellite systems. As a consequence, for filings related to non-geostationary networks subject to coordination and received on or after 1 July 2019, there will be an additional fee per additional unit (equal to the flat fee divided by 50 000) from 25 000 to 75 000 units and above 75000 units there will be no additional fee per additional unit.





### 2.11.2 Exceptionally large geostationary satellite filings

At its 2019 session, the Council instructed the Director of the Radiocommunication Bureau to report to WRC-19 on exceptionally large geostationary satellite filings (see § 2.2.24 of [Document C19/120](https://www.itu.int/md/S19-CL-C-0120/en)).

Geostationary satellite filings with more than 100 000 units, while rare, have regularly been submitted and processed since 2009 (31 notices submitted by 4 administrations). The Bureau considered that these types of satellite filings were a form of upper bound to the complexity of geostationary satellite filings. However, in recent years (2016 and 2017), the levels of 200 000 units (5 notices submitted by one administration) then of 300 000 units (6 notices submitted by one administration) have been exceeded.

Such satellite filings remain rare and therefore the word “exceptional” is accurate to characterize them. However, from a processing point of view, they have a disproportionate impact on the overall examination and publication process, because they require additional computing resources, increased human analysis and may on rare occasions require software updates (design, implementation, tests and deployment).

For example, for the abovementioned 6 coordination requests of geostationary satellite filings having more than 300 000 units that were received in 2017, the average time for receivability was 8.3 person-days (compared to 4.5 person-days for other satellite filings), the average examination time was 83.8 person-days (compared to 5.1 person-days for other satellite filings) and the average time for preparing the special section was 17.5 person-days (compared to 2.5 person-days for other satellite filings).

Such filings require more resources from the Bureau compared with satellite filings having averaged number of units and may also increase the amount of coordination to be performed by the notifying administrations of subsequent submissions.

In order to address the regulatory side of these exceptional cases, the Radio Regulations Board, at its the 77th meeting (19 – 23 March 2018), “instructed the Bureau to consult with administrations on the significant impact on the processing time for complex and extensive satellite network filings, and to invite them to comply with the provisions of RR No. 4.1 when they notify the frequency requirements for their satellite networks.”

Council 2019 endorsed the instruction of the Radio Regulations Board to the Radiocommunication Bureau and decided that, in the event of any additional submissions of exceptionally complex geostationary satellite filings, the Council Expert Group on Decision 482 will consider whether the introduction of one or several additional break point(s) concerning these types of complex geostationary filings in the methodology of Decision 482 and administrative solutions together with regulatory decisions adopted by WRC-19 would be effective (see Terms of Reference of the Council Expert Group contained in Annex J to [Document C19/107](https://www.itu.int/md/S19-CL-C-0107/en)).

**The Conference may therefore wish to consider regulatory solutions to the issue of exceptionally complex geostationary satellite filings.**

# 3 Application of the Radio Regulations for terrestrial services

## 3.1 General observations

In the period between WRC‑15 and WRC‑19, the Bureau dealt with a substantive number of activities related to terrestrial services. These activities included processing and examination of submissions from administrations, mainly frequency assignment notices to stations in various terrestrial radiocommunication services, under the relevant provisions of Articles **9**, **11**, **12** and **20** of the Radio Regulations (RR) and various regional agreements.

In this period, the Bureau examined frequency assignment notices to terrestrial services under two different sets of provisions: under Article **11** of the RR (2012 edition) for notices received between 28 November and 31 December 2016, and under Article **11** of the RR (2016 edition) for notices received after 31 December 2016. In addition, the submissions related to plan modifications were treated in accordance with the relevant regional agreements.

During the reporting period, all regulatory deadlines for processing terrestrial submissions set up in the Radio Regulations and regional agreements have been met.

The activities related to terrestrial services also covered maintenance of the Master Register, worldwide and regional plans, including periodical review of findings of the corresponding assignments, technical and regulatory assistance to administrations, enhancement of terrestrial software, including the notice processing systems TerRaSys and MARS, web portals and standalone examination tools. These activities are summarised below.

## 3.2 Coordination requests pertaining to terrestrial services

This activity comprises the processing of all coordination requests pertaining to terrestrial services mainly under No. **9.21** of the RR, including the regulatory and technical examinations, publication of the relevant Special Section in BR IFIC, monitoring of the procedures and publication of the resulting situation upon expiry of the deadlines through Special Sections in BR IFIC.

With respect to the cases submitted under No. **9.21**, during the reporting period (2015-2019), all of the requests for the application of the procedure under No. **9.21** were related to Nos. **5.177, 5.316B** and **5.430A** (from amongst the 42 footnotes that are applicable to terrestrial services).

Table 3.2-1 summarizes statistics on the Bureau’s activities related to coordination requests pertaining to terrestrial services.

Table 3.2-1

Activities related to coordination requests pertaining to terrestrial services

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 2015 | 2016 | 2017 | 2018 | 2019[[2]](#footnote-2) |
| No. of received cases | 0(Broadcasting services) 0(Other services) | 2(Broadcasting services)106(Other services) | 0(Broadcasting services)203(Other services) | 0(Broadcasting services)42(Other services) |  0(Broadcasting services)31(Other services) |
| No. of treated cases[[3]](#footnote-3) | 0(Broadcasting services)0(Other services) | 2(Broadcasting services)106(Other services) | 0(Broadcasting services)203(Other services) | 2(Broadcasting services)44(Other services) | 0(Broadcasting services)32(Other services) |

The Bureau processed all these requests within the statutory limits. At the time of preparation of this Report there was no backlog in this activity.

## 3.3 Plan modification procedures for terrestrial services

**3.3.1** This activity comprises the processing of submissions under various plan modification procedures, including the relevant coordination and/or compatibility examinations, where appropriate, and publication of the initial and final results in Special Sections. These activities are performed either through TerRaSys (for the AP25 Plan and for the Plans governed by Regional Agreements ST61, GE84, GE89, GE85EMA, GE06A, GE06D and GE06L) or through other standalone systems, not yet integrated in TerRaSys (for the AP26 Plan, as well as for the Plans governed by Regional Agreements GE75, RJ81 and GE85MM).

The Bureau processed all these requests within the statutory limits. There is no backlog in the treatment of submissions under all these plans. Table 3.3-1 summarizes the Bureau’s activities concerning the processing of submissions for plan modification procedures for terrestrial services.

Table 3.3-1

Activities related to plan modification procedures pertaining to terrestrial services

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 2015 | 2016 | 2017 | 2018 | 20192 |
| No. of received assignments | 20 318 | 14 660 | 7 210 | 8 210 | 3 630 |
| No. of assignments/allotments resulting in updates to the relevant Plan | 6 186 (Broadcasting services)106 (Other services) | 10 366 (Broadcasting services)1 (Other services) | 6 174 (Broadcasting services)55 (Other services) | 6 644 (Broadcasting services)79 (Other services) | 3 715 (Broadcasting services)356 (Other services) |

The relevant details (the notices under treatment and updated versions of the master copies of the Terrestrial Frequency Assignment and Frequency Allotment Plans), are distributed through the consolidated publication BR IFIC-terrestrial services, which is published every two weeks. These master copies of the plans also include the results of the plan modification procedures that are carried out through standalone systems (outside the TerRaSys).

## 3.4 Notification, examination, recording and other regulatory procedures

### 3.4.1 Notification procedure (Article 11 of the Radio Regulations)

**3.4.1.1** This activity comprises the processing (i.e. reception, registering, validation, correspondence, data correction and publication in BR IFIC) of the notices received from administrations, as well as subsequent examination under the relevant provisions of Article **11** of the Radio Regulations (in conformity with the Table of Frequency Allocations and the other provisions of the Radio Regulations and, where appropriate, from the viewpoint of their conformity with the coordination procedures or with a frequency allotment or assignment Plan and/or to other provisions of the Agreement, when applicable). The Bureau examined all notices within the regulatory limits, including the notices in the bands shared with space services, where the examination of notices related to terrestrial services is in phase with the processing of notices related to space services. Table 3.4.1‑1 summarizes the Bureau’s activities in this respect.

Table 3.4.1-1

Activities related to notification procedures pertaining to terrestrial services

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 2015 | 2016 | 2017 | 2018 | 20192 |
| No. of received notices | 137 283 | 216 667 | 139 958 | 107 327 | 50 485 |
| No. of examined notices | 4 617 (Broadcasting services)104 061(Other services) | 6 732(Broadcasting services)163 802 (Other services) | 19 382 (Broadcasting services)89 882 (Other services) | 2 907(Broadcasting services)79 543 (Other services) | 1 774(Broadcasting services)30 067(Other services) |
| No. of notices pending examination (earliest date of receipt) | 10 421 (Services other than broadcasting)09.07.2015 | 13 702 (Services other than broadcasting)22.04.2016 | 25 518 (Services other than broadcasting)02.02.2017 | 20 443(Services other than broadcasting)26.01.2018 | 25 438(Services other than broadcasting)19.09.2018 |

**3.4.1.2** It is also to be noted that, after WRC‑15, the Bureau carried out the following activities with a view to implementing the relevant decisions of WRC‑15 related to the procedures of notification and recording of terrestrial services:

– the existing Rules of Procedure were reviewed and appropriate changes were proposed, where necessary, for consideration by the Radio Regulations Board;

– all internal procedures were reviewed and several elements of the production chain (validation rules, examination rules, finding system) have been adapted to the modified requirements of the Radio Regulations and to the modified Rules of Procedure;

– Findings of frequency assignments recorded in the Master Register were reviewed so as to reflect the modified conditions established by WRC‑15, for example:

– the assignments to stations in the fixed and mobile services in a number of countries in the bands 1 810-1 830 kHz (No.**5.98**), 3 500-3 750 kHz (No.**5.119**), 50-51 MHz (No.**5.166**) and 132-136 MHz (No.**5.201**) were suppressed due to the deletion of the respective allocations;

– the findings of the assignments to stations in the fixed and mobile services in the bands 54-68 MHz (No.**5.172**), 68-72 MHz (No.**5.173**), 174-216 MHz (No.**5.234**), 470-512 MHz (Nos. **5.292** and **5.293**) and 614-806 MHz (No. **5.293**) were reviewed due to the downgrading of the category of allocation to the fixed and mobile services;

– the findings of the assignments to stations in the fixed and mobile services recorded in the Master Register were reviewed in the frequency band 790-862 MHz pursuant to the abrogation of Nos. **5.314** and **5.315**, and in the band 3 400-3 600 MHz in Region 1 due to the modification of the Table of Frequency Allocations in Article **5** and also introduction of the coordination requirement under No **9.21** (No **5.430A**).

### 3.4.2 Processing of submissions for HF broadcasting schedules

#### 3.4.2.1 Application of the procedures of Article 12 of the Radio Regulations

This activity comprises the technical examination of submissions related to HF broadcasting schedules under the procedure of Article 12 of the Radio Regulations, including the identification of severe incompatibilities. It also comprises the selection of appropriate bands and frequencies when requested by administrations, and the preparation of tentative and final schedules.

In the reporting period,totally 44 CD-ROMs have been published in 2015, 2016, 2017 and 2018. Starting from January 2019, the CD-ROM publication was discontinued and replaced by free of charge online publication. Six online publications were issued in 2019 by the date of preparation of this document. Five more will be published before the end of this year. The online publication contains, *inter alia*, HFBC schedules, results of compatibility analysis and the latest version of the HFBC software.

This activity also comprises exchange of correspondence with administrations and regional coordination groups concerning possible improvements to software, update of reference data, improvements in the presentation of calculation results, and maintenance of webpages with the latest software updates and reference data. It also comprises participation of the Bureau in the coordination meetings of the regional coordination groups.

Table 3.4.2.1-1 summarizes the Bureau’s activities with respect to the preparation of HFBC schedules.

Table 3.4.2.1-1

Activities related to preparation of HF broadcasting schedules

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 2015 | 2016 | 2017 | 2018 | 20192  |
| No. of processed cases | 37 381 | 32 812 | 32 523 | 31 215 | 19 101 |

## 3.5 Activities related to the end of the Transition period from analogue to digital broadcasting set forth by the GE06 Regional Agreement

According to provision 12.6 of Article 12 of the GE06 Regional Agreement, the Transition period from analogue to digital broadcasting ended on 17 June 2015 for all countries of the GE06 planning area, with the exception of 35 administrations for which the Transition period for the VHF band ends on 17 June 2020 according to footnotes 7 and 8 of Article 12 of the GE06 Agreement.

At the end of the first Transition period the Bureau took the following actions:

– 16 763 assignments have been cancelled from the MIFR at the request of the notifying administrations;

– 27 121 analogue television assignments have been kept in the MIFR and their findings were reviewed accordingly.

## 3.6 Other regulatory procedures pertaining to terrestrial services

### 3.6.1 Resolution 12 (WRC-12)

Resolution 12 (WRC-12) instructs the Director of the BR to report to the WRC-15 on the progress achieved in the implementation of this Resolution, which deals with assistance and support to Palestine.

In January 2016 the BR received from Palestine 1 959 assignments of the land mobile service for inclusion in the List of the other primary services of the GE06 Agreement. The assignments were published in Part A of a GE06 Special Section in March 2016. During coordination of these assignments with neighboring administrations the Bureau provided regulatory and technical advice to Palestine. However, due to unfinished coordination with several administrations the coordination requests lapsed and the 1 959 notices were removed from BR’s database.

Palestine may resubmit these assignments to the MIFR to have them recorded with full rights with respect to agreed administrations and on a non-interference basis vis-à-vis the objecting ones.

## 3.6.2 Resolutions 205 (Rev.WRC-15)

Resolution **205 (Rev.WRC-15)** deals with the protection of the systems operating in the mobile-satellite service in the band 406-406.1 MHz and instructs the Director of the BR:

– to continue to organize monitoring programs in the frequency band 406-406.1 MHz in order to identify the source of any unauthorized emission in that band;

– to organize monitoring programmes on the impact of unwanted emissions from systems operating in the frequency bands 405.9-406 MHz and 406.1-406.2 MHz on MSS reception in the frequency band 406-406.1 MHz in order to assess the effectiveness of this Resolution, and to report to subsequent World Radiocommunication Conferences.

With respect to the first issue, the monitoring program in the frequency band 406-406.1 MHz is a long-term task originally assigned to the BR by Resolution 205 at WARC MOB-87 in 1987. In the reporting period between WRC‑15 and WRC‑19 the Bureau continued to ensure the necessary liaison between administrations performing special monitoring programmes in the band 406‑406.1 MHz and the administrations from where unauthorized emissions are generated. As a result of this liaison, several unauthorized emissions ceased. The Bureau also liaised with the COSPAS-SARSAT Secretariat on these issues and participated in the meetings of the Joint Technical Committee of this organization.

Concerning the second issue, ITU-R Working Party 1C, in collaboration with the Cospas-Sarsat Joint Committee and the Bureau, identified possible ways of monitoring the bands 405.9-406 MHz and 406.1-406.2 MHz and completed the list of parameters to be measured. This list is contained in Recommendation ITU-R SM.1051-4 “Priority of identifying and eliminating harmful interference in the band 406-406.1 MHz” approved in September 2018. In December 2018, the Bureau issued Circular Letter [CR/438](https://www.itu.int/md/R00-CR-CIR-0438/en) inviting administrations to participate in the monitoring programme Only one monitoring report concerning the terrestrial component has been received to the date of the preparation of this document.

The monitoring results on the band 406-406.1 MHz and the adjacent bands are summarized in the Table below (rows 3 and 4). For the completeness of the report on the monitoring activities, Table 3.6.2-1 below also provides the data on regular monitoring in frequency bands between 2 850 kHz and 28 000 kHz (row 1). All observations from this regular monitoring were processed in a timely manner and were made available on the ITU website.

Table 3.6.2-1

Summary information regarding the treatment of monitoring reports

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 2015 | 2016 | 2017 | 2018 | 20192 |
| Regular monitoring in the bands 2 850 kHz and 28 000 kHz: No. of observations processed | 44 870 | 48 832 | 22 496 | 27 908 | 22 147 |
| Special monitoring under Res. 205: No. of unauthorized emissions in the band 406-406.1 MHz | 115 | 163 | 202 | 222 | 128 |
| Special monitoring under Res. 205: No. of measurements in the bands 405.9-406 MHz and 406.1-406.2 MHz | 0 | 0 | 0 | 0 | 26 |

### 3.6.3 Implementation of Resolution 535 (Rev.WRC-15)

Resolution **535 (WRC-15)** deals with the information needed for the application of Article **12** of the Radio Regulations . It *instructs the Director of the Radiocommunication Bureau* in item 2 “to consider improvements to the established arrangements for the preparation, publication and dissemination of the information relating to the application of Article **12**, in consultation with administrations and regional coordination groups”.

In 2018 the Bureau initiated extensive consultations with administrations and HFBC regional coordination groups on a possible replacement of the publication of HFBC schedules on CD-ROM by online publications. Followed positive responses from administrations, CD-ROM publication of the schedules was replaced, as of 1 January 2019, by an online publication that is free of charge. This arrangement is aimed at facilitating communications with the notifying organizations as well as the coordination of the HFBC requirements through the use of modern electronic means. Administrations were informed about this change by Circular Letter [CR/432](https://www.itu.int/md/R00-CR-CIR-0432/en) on 3 July 2018.

### 3.6.4 Implementation of Resolutions 749 (Rev. WRC-15) and 760 (WRC-15)

Resolution **749 (Rev. WRC-15)** deals with the use of the frequency band 790-862 MHz in countries of Region 1 and the Islamic Republic of Iran by mobile applications and by other services.

Resolution **760 (WRC-15)** deals with the use of the frequency band 694-790 MHz in countries of Region 1 by the mobile, except aeronautical mobile, service and by other services.

In both resolutions, WRC-15 decided that administrations implementing the mobile service shall seek agreement under No. **9.21** with respect to the aeronautical radionavigation service in the countries mentioned in No. **5.312** of the Radio Regulations.

In order to ensure processing of the relevant coordination requests, the Bureau developed and implemented an examination module for the identification under No. **9.21** of administrations potentially affected by stations in the mobile service in these frequency bands.

The Bureau wishes to report that by the date of preparation of this document no coordination request has been received related to MS stations in the band 694-790 MHz and 154 coordination requests were treated in the frequency band 790-862 MHz.

### 3.6.5 Implementation of Resolution 647 (Rev.WRC‑15)

Resolution **647** **(Rev.WRC-15)**, *inter-alia*, encourages administrations to communicate to BR the relevant up-to-date administration contact information and, where available, the frequencies or frequency bands for use in emergency and disaster relief operations.

The Bureau made necessary changes to its software and database to accommodate the modifications to this Resolution by WRC-15. It is to be noted that after WRC-15, only one administration submitted information to the BR.

To date, the database contains information received from the following administrations: South Africa, Argentina, Armenia, Saudi Arabia, Bahrain, Belarus, Myanmar, Brunei Darussalam, Canada, Spain, Egypt, Estonia, Finland, Italy, Jordan, Kuwait, Malaysia, New Zealand, Oman, Portugal, Qatar, Seychelles, Slovakia, Syria, Thailand, United Arab Emirates and Uzbekistan for terrestrial services, and Canada, Czech Republic, United Kingdom, Malaysia, Romania and Slovakia for space services.

### 3.6.6 Studies in response to the parts of Resolution 223 (Rev.WRC-15) related to the frequency band 4 800-4 990 MHz and RR No. 5.441B

With respect to the frequency band 4 800-4 990 MHz, Resolution **223 (Rev.WRC-15)** *invites ITU‑R*:

“6 to develop harmonized frequency arrangements for the frequency bands 3 300‑3 400 MHz and 4 800-4 990 MHz for operation of the terrestrial component of IMT, taking into account the results of the sharing studies;

7 to study the technical and regulatory conditions for the use of IMT in the frequency band 4 800-4 990 MHz in order to protect the aeronautical mobile service.”

Concerning *invites ITU-R 6*, by the time of preparation of this Report, ITU-R Working Party (WP) 5D developed draft frequency arrangement for the frequency band 4 800-4 990 MHz that was included in the preliminary draft revision of Recommendation ITU-R M.1036-5.

Concerning *invites ITU-R 7*, prior to CMP19-2, WP 5D carried out some studies of the issue that have been summarized in the Report of the CPM to WRC-19 (see Chapter 6) and, therefore, are not reproduced in this Report of the Director.

After CPM19-2, at its 32nd meeting in July 2019, WP 5D considered a new contribution and the summary of discussion on 4 800 MHz (review of RR No. **5.441B**) can be found in Attachment 4.8 to Chapter 4 of Document [5D/1297](https://www.itu.int/md/R15-WP5D-C-1297/en).

In view of the above and taking into account that the criterion in footnote RR No. **5.441B** is subject to review at WRC-19, as indicated in this footnote, the Conference is invited to consider the matter and take appropriate action.

## 3.7 Software development related to the terrestrial services

In the period between WRC‑12 and WRC‑15, the software related to terrestrial services was enhanced with additional functionalities and modules.

### 3.7.1 Activities related to software development for processing of terrestrial notificationsunder TerRaSys

– Incorporation of GE06D Article 4 standalone examination module into TerRaSys;

– Completion of the software used for examination of notices under the new Rule of Procedure on No. 9.19;

– Finalization of the examination module for processing of notices under No. **9.21** in the bands identified for IMT at WRC-15;

– Enhancement of different TerRaSys modules, including TerRaCoord and TerRaPub;

– Incorporation of GE06L Article 4 standalone examination module into TerRaSys, including the new system type code ‘ND’ for the application of the GE06 coordination procedure and notification of frequency assignments to stations of IMT-2000 and IMT-Advanced systems.

### 3.7.2 Activities related to other software development for processing of terrestrial notifications

–The migration of the database for List IV (List of Coast Stations) and List V (List of Ship Stations) from Ingres to SQL and the development of a new web-based application and publication software;

– Completion of the migration of GLAD database from Ingres to SQL server, including a new interface for updating GLAD and new layout for the publication of GLAD information on web;

– Further enhancement of the software packages of eBCD2.0 tools for broadcasting services, including the display of all correspondence for broadcasting services in the myAdmin portal. Moving eBCD2.0 to using MVC technology;

– Completion of the development of e-MIFR, which is a Web application that provides on‐line access to the MIFR for all terrestrial services;

– Revision of the GE84 compatibility analyses and integration it in eTools (replacing the standalone GE84Pln application).

### 3.7.3 Other software related activities

– Adaptation of the GE06Calc and Compatibility analysis to be used for the VHF and UHF frequency coordination meetings in Central America and Caribbean planning activities for analogue and digital assignments (Digital-to-Digital, Digital-to-Analogue, Analogue-to-Digital, Digital-to-Fixed and Mobile and Fixed and Mobile to Digital compatibility analysis);

– Commencement of work on a common BR GIS (Geographical Information System). Establishment of the partnership with the UN Cartographic Unit to benefit from UN GIS expertise and resources and to allow easier access to the UN maps.

# 4 Study Groups

## 4.1 BR support for Study Group activities

Since RA-15, the Radiocommunication Bureau has continued to support the work of six ITU‑R Study Groups, the Coordination Committee for Vocabulary (CCV) and the Conference Preparatory Meeting (CPM). It has contributed to meetings of RAG and subsequently responded to advice offered by RAG concerning Study Group and other ITU-R activities (See Section 5). Towards the end of the study period, its responsibilities have also included the preparation for the Radiocommunication Assembly 2019 (RA-19) and the World Radiocommunication Conference 2019 (WRC‑19) (See Section 1).

## 4.2 Response to the results of RA-15

The Radiocommunication Assembly in 2015 approved the 41 Resolutions that serve as the basic texts and directives upon which the Study Groups undertake their responsibilities.

Resolutions ITU‑R 4 and 5 provide the structure of the Study Groups and their respective work programmes. These Resolutions were used as the basis for the Study Group work during the 2015‑2019 study period.

Resolution ITU‑R 9 (Liaison and collaboration with other organizations) recognizes the need to facilitate coordination and information exchange between ITU‑R and other bodies, particularly those involved with standards development. The Resolution as revised at RA-15 includes the principles for interaction of ITU‑R with other organizations, and these principles have been used by BR and the Study Groups for such interactions. In particular, the collaboration with the CISPR has been increased significantly.

RA-15 approved several new and revised Resolutions relating to the work of the Study Groups concerning, for example, spectrum management and monitoring, short-range devices, disaster prediction detection mitigation and relief, cognitive radio systems, terrestrial electronic news gathering systems, reduction of energy consumption for environmental protection, Internet of Things, mitigation of climate change, Telecommunication/ICT accessibility, regulatory procedures for small satellites, international public telecommunications via satellite in developing countries, and the concerned Study Groups have taken due note of such Resolutions in their work programmes.

Resolution ITU-R 69 “Development and deployment of international public telecommunications via satellite in developing countries” was approved by the Radiocommunication Assembly (RA-15). It mandates ITU-R to conduct a number of activities and studies and *instructs the Director of the Radiocommunication Bureau* to report the results of these studies to WRC‑19.

Two specific topics associated to Resolution ITU-R 69 have been addressed by ITU-R: broadband technologies via satellite and Next Generation Access Technologies.

Activities were conducted on two ITU-R Recommendations/Reports which can be associated to the mandate of Resolution ITU-R 69, and satisfy the request for information on satellite technologies.

ITU-R produced a revision of Recommendation ITU-R S.1782-0 “Possibilities for global broadband Internet access by fixed satellite systems”, with a new title “Guidelines on global broadband Internet access by fixed-satellite service systems”, which reflects the very significant evolution, both in technology and deployment, of FSS systems to provide broadband services.

ITU-R also produced Report ITU-R M.2460-0 “Key elements for integration of satellite systems into Next Generation Access Technologies” which provides key elements of satellite networks and use cases envisaged for Next Generation Access Technologies.

ITU-R has been responding to ITU-D with requested information and collaboration and liaised key Recommendations and Reports associated to broadband Internet over satellite networks and will continue to inform ITU-D on the progress of this work and provide relevant updates when available.

Resolution ITU-R 69 (RA-15) continues to serve as a guidance to studies and activities carried out in both ITU-R and ITU-D concerning the development and deployment of international public telecommunications via satellite in developing countries.

In agreement with Resolution 169 (Rev. Dubai, 2018) to further enhance participation of academia in the work of the Union, academia members have been granted access to all Study Group documentation and are able to participate in the Radiocommunication Assembly, Study Groups and Working Party meetings. In accordance with *resolves* 5 of Resolution 169 (Rev. Dubai, 2018), academia do not have a role in decision-making, including the adoption of resolutions and recommendations regardless of the approval procedure. During the study period 2015-2019, 165 delegates from academia members have participated in meetings of Study Groups and Working Parties.

## 4.3 Preparatory work for WRC‑19

Study Group activities in preparation for WRC‑19 were conducted through the CPM process, in accordance with Resolution ITU‑R 2-7.

The first session of the 2019 Conference Preparatory Meeting (CPM19-1) was held in Geneva on 30 November ‑1 December 2015 to organize the preparatory studies for WRC-19. It also identified studies in preparation for the following WRC. A structure for the CPM Report to WRC-19 was agreed together with a preparatory process, working procedures and a chapter structure. The meeting appointed a Rapporteur for each chapter to assist the Chairman in managing the development and flow of draft report contributions. The results of CPM19-1 were published in Administrative Circular [CA/226](https://www.itu.int/md/R00-CA-CIR-0226/en) of the Radiocommunication Bureau, dated 23 December 2015.

The ITU-R preparations for WRC-19 were concentrated in the following responsible groups (listed in the order of the Study Groups):

**Study Group 1** chaired by Mr S. Pastukh (Russian Federation), WP 1A chaired by Mr Raphael Garcia De Souza (Brazil (Federative Republic of)) and WP 1B chaired by Mr Ruoting Chang (China (People’s Rep. of)) and since September 2018 by Mr Leo Kibet Boruett (Kenya (Republic of));

**Study Group 4** chaired by Mr C. Hofer (United States of America), WP 4A chaired by Mr J. Wengryniuk (United States of America) and WP 4C chaired by Mr Nobuyuki Kawai (Japan);

**Study Group 5** chaired by Mr M. Fenton (United Kingdom of Great Britain and Northern Ireland), WP 5A chaired by Mr J. Costa (Canada), WP 5B chaired by Mr J. Mettrop (United Kingdom of Great Britain and Northern Ireland), WP 5C chaired by Mr P. Nava (Italy), WP 5D chaired by Mr S  Blust (United States of America), **Task Group 5/1** chaired by Ms C. Cook (Canada);

**Study Group 7** chaired by Mr J. Zuzek (United States of America), WP 7B chaired by Mr B. Kaufman (United States of America) and WP 7C chaired by Mr E. Marelli (European Space Agency) and later chaired by Mr M. Dreis (German (Federal Republic of));

Texts for the draft CPM Report were prepared by the responsible groups identified by CPM19‑1 and provided by the Chairmen of these groups to the CPM-19 Chapter Rapporteurs.

The work was coordinated by the Chairman of CPM-19, in consultation with the CPM-19 Management Team, as defined in Sections 5 and 6 of Annex 1 to Resolution ITU-R 2-7.

In accordance with Section 6 of Annex 1 to Resolution ITU-R 2-7, the CPM-19 Management Team meeting was held in Geneva from 6 to 7 September 2018. It consolidated the draft CPM Report which was made available, in six languages before the deadline stipulated in Resolution ITU-R 2-7, to all Member States and Radiocommunication Sector Members as Document CPM19-2/1.

The Director provided to the second session of CPM-19 (CPM19-2) Reports on WRC-19 agenda items 2 and 4, as well as a preliminary draft Report on WRC-19 agenda item 9 (see Documents CPM19-2/12, 9 and 17 respectively).

CPM19-2 met in Geneva from 18 to 28 February 2019 under the chairmanship of Mr K. Al-Awadhi (United Arab Emirates) to consider the draft CPM Report, the contributions from the ITU membership and the additional material submitted by the Radiocommunication Bureau.

CPM19-2 divided the work amongst six working groups according to the agreed Chapters structure. Many sub-groups were also established, including a drafting group of plenary to deal with footnote No.5.441B of the Radio Regulations.

table 4.3-1

Structure of the CPM19-2 Report

|  |  |  |
| --- | --- | --- |
| CPM19-2Groups | Topic | Chairman |
| Working Group 1 | Chapter 1 (Land mobile and fixed services) – AI 1.11, 1.12, 1.14, 1.15 | Ms K. Zhu (CHN) |
| Working Group 2 | Chapter 2 (Broadband applications in the mobile service) – AI 1.13, 1.16, 9.1 (issues 9.1.1, 9.1.5, 9.1.8) | Mr J. Arias Franco (MEX) |
| Working Group 3 | Chapter 3 (Satellite services) – AI 1.4, 1.5, 1.6, 7, 9.1 (issues 9.1.2, 9.1.3, 9.1.9) | Mr N. Varlamov (RUS) |
| Working Group 4 | Chapter 4 (Science services) – AI 1.2, 1.3, 1.7 | Mr V. Meens (F) |
| Working Group 5 | Chapter 5 (Maritime, aeronautical and amateur services) – AI 1.1, 1.8, 1.9 (1.9.1, 1.9.2), 1.10, 9.1 (issue 9.1.4) | Mr W. Sayed (EGY) |
| Working Group 6 | Chapter 6 (General issues) – AI 2, 4, 9.1 (issues 9.1.6, 9.1.7), 10 | Mr P.N. Ngige (KEN) |
| Drafting Group of the Plenary | Footnote No. **5.441B**, resulting in text included in Chapter 6 (General issues) under AI 9.1 with cross reference in Chapter 2. | Mr S. Pastukh (RUS) |

Since CPM19-2, the CPM Report has become a contribution to WRC‑19 as Document 3.

The Report comprises six Chapters, following the structure described above.

The Report also contains in the Annex a list of the ITU-R Recommendations, ITU-R Reports and other publications, including certain draft new or revised Recommendations and Reports, that are referred to in the text of the CPM Report. The final version of this list reflecting the decisions of the Radiocommunication Assembly 2019 will be made available to the World Radiocommunication Conference 2019.

## 4.4 Recommendations, Handbooks and Reports

Up to September 2019, around 200 new or revised Recommendations and around 180 new or revised Reports have been approved in the 2015-2019 study period. Many of these have stemmed from studies associated with CPM activities, although a good number reflect the vital “basic” studies that underpin the fundamental work of the Study Groups.

## 4.5 Liaison with ITU‑D and ITU‑T

The BR has been instrumental in supporting ITU‑R liaison with ITU‑D and ITU‑T and between the respective Bureaux. Such liaison influences areas of study within the Study Groups and helps to avoid duplication of effort in the three Sectors. See Sections 4.2 and 8 for further detail.

## 4.6 Liaison and collaboration with other organizations

Effective collaboration with other organizations has been undertaken within the framework of Resolution ITU‑R 9. See Section 8 for further details.

## 4.7 Support to membership

During the study period, participants of the ITU‑R Study Groups, as well as staff of the BR, have continued to respond to requests for information and guidance on technical issues concerning the work of the Study Groups. Such questions often relate to problems encountered by Members from developing countries who are seeking relevant ITU‑R texts or an explanation of the material contained therein. Assistance has also been provided by way of presentations at seminars or workshops (see Sections 6 and 9).

## 4.8 Statistics regarding meetings, documentation and finalized texts (in electronic or paper form)

The following figures relate to the study period since RA-15:

– Number of documents processed (to September 2019): 26 153

– Number of pages processed (to September 2019): 388 667

– Number of meetings: 177

– Number of meeting days (total): 988

– Number of days on which meetings were held (block meeting days): 488

– Average number of participants at SG and WP meetings: 108

– Number of Recommendations approved (to September 2019): 200

– Number of Reports finalized (to September 2019): 186

– Number of Handbooks finalized (to September 2019): 6

# 5 Radiocommunication Advisory Group

Twenty-third meeting (13 May 2016)

RAG noted the reports on the results of both the Radiocommunication Assembly 2015 and the World Radiocommunication Conference 2015, and thanked the Director and his staff for the good organization and smooth running of both events.

RAG established a Rapporteur Group to follow up on the software developments related to the implementation of Resolutions 907 (Rev. WRC-15) and 908 (Rev. WRC-15).

RAG encouraged administrations to submit their contributions on agenda item 10 as early as possible, preferably one month before WRC-19.

As one of the problems for the scheduling of Study Groups and other meetings is the availability of meeting rooms at ITU premises, RAG encouraged its members to take this need into consideration in preparing for the discussions on the facilities to be offered by the new Varembé building. RAG also noted the need for this building to be designed to facilitate access by persons with disabilities.

RAG updated the revised guidelines for the working methods of the RA, ITU-R Study Groups and related groups prepared by the secretariat as a consequence of the decisions taken by the RA-15.

RAG welcomed the plan proposed by the Bureau for the celebrations to mark the 110th Anniversary of the Radio Regulations.

RAG welcomed the recent development by the Bureau of the Radio Regulations Navigation Tool, which is a useful instrument to help users to easily browse through the Radio Regulations.

RAG noted the document on the mapping of the ITU-R activities and objectives into the Sustainable Development Goals (SDGs). RAG invited Members to send further comments to the Director, towards improving this living document. It was suggested to provide specific examples of how actions taken by the ITU-R enable, even indirectly, the implementation of the SDGs.

Twenty-fourth meeting (28 April 2017)

RAG noted that Council Decision 482 does not fully accommodate cost recovery for non-GSO FSS systems submitted to the BR recently (during the last 12-18 months). There is a substantial difference (in some cases more than 10 times) between the cut-off limit of units established by Council Decision 482 and the actual number of units required to process extensive non-GSO FSS networks filings. It is recognized that this is, among other issues, the result of the complexity of these non-GSO FSS systems and the huge number and complexity of their examination procedure. This resulted not only in delaying non-GSO FSS filings publication but GSO FSS filings publication as well. RAG advised the BR Director to inform Council-17 of this ongoing consideration.

RAG also advised the BR Director to inform Council about the two possible options for the cost recovery of processing by the BR of extensive non-GSO FSS filings.

RAG further invited the Director to request the Council to provide guidance on how to address the issue of cost recovery of the non-GSO FSS filings without adverse impact on the ITU’s satellite network filing process.

RAG noted that the Administration of Egypt has recently confirmed their commitment to host both the RA and WRC-19 in Sharm El-Sheikh on the dates already approved by Council.

RAG decided to send a Liaison Statement to the TDAG to reflect those concerns and suggest possible improvements on cooperation and coordination between ITU-R and ITU-D on WTDC Resolution 9.

RAG endorsed the proposed draft ITU-R rolling Operational Plan for 2018-2021 with some amendments and requested the Director to take into consideration the following aspects for the preparation of the Strategic Plan and the corresponding ITU-R Operational Plans for the coming cycle:

– to distinguish between the objectives of the ITU-R Sector and those of the Bureau;

– to ensure that the statistical values (indicators) are collected from trustworthy sources.

Twenty-fifth meeting (28 March 2018)

RAG noted the information on cost recovery for satellite network fillings, in particular regarding the study prepared by the BR, on the technical issues arising in connection with processing complex non-geostationary satellite (non-GSO) systems. RAG agreed that this highly sensitive issue should be treated with caution, as some issues related to non-GSO systems are studied in preparation for WRC-19 and the conference’s decisions may have an impact on the cost recovery procedure.

RAG noted that Council-17 considered again the topic of ITU’s role as supervisory authority of the international registration system for space assets under the Space Protocol, and observed that the final decision on the matter should be taken by the Plenipotentiary Conference later this year.

RAG noted the actions undertaken so far by the Bureau to implement WRC-15 decisions relating to both space and terrestrial services, in particular the software development activities aimed at implementing Resolutions 907 and 908.

RAG considered the latest version of the draft ITU Strategic Plan 2020-2023 as prepared by the Council Working Group for Strategic and Financial Plans (CWG-SFP) in 2018 and noted the key elements of the draft rolling Operational Plan for the ITU-R for the period 2019-2022.

RAG noted that there are areas of overlap in the activities of the different sectors and that further efforts should be made to avoid such overlaps. RAG invited the Director to work with the Directors of the other sectors to identify areas of overlap and bring them to the attention of the Inter-Sector Coordination Team and the Inter-Sectoral Coordination Task Force, with a view to eliminating the overlaps.

Comments were expressed by members about the difficulties encountered in searching for specific documents (both regarding the search tools available and the cumbersome procedure involving passwords on the publication webpages, etc.) as well as the lack of a harmonized approach for the website of all sectors.

Twenty-sixth meeting (16 April 2019)

RAG noted the report on PP-18 results, with emphasis on issues relating to the work of the ITU-R sector, including the Strategic and financial Plans for the period 2020-2023.

RAG noted the information provided in the Director’s report on cost recovery for satellite network fillings and called on the Bureau to inform WRC-19 on the excessive number of submissions under Article 6 of Appendix 30B the overwhelming majority of which are of global coverage with limited small service area.

RAG noted actions undertaken so far by the Bureau to implement WRC-15 decisions relating to both space and terrestrial services, in particular the software development activities implementing Resolutions 907 and 908. RAG also highlighted the satisfaction expressed by those who have started utilizing the systems developed by the Bureau.

RAG applauded efforts made by the BR in modernizing its software systems and providing more user friendly interfaces wherever possible. Software developments and enhancements made by BR for terrestrial services include the introduction of online free of charge HFBC schedules and software, integration of GE06 agreement Article 4 processing into TerRaSys, extension of web tools with terrestrial data, calculations and correspondences, development of GIS tools and some others. For space services, the most important achievements are the progress on the BR Space Information Systems roadmap and the release of the operational version of the on-line application “Satellite Interference Reporting and Resolution System”.

RAG noted some issues relating to ITU-R Resolution 2 and urged Member States to reflect on the way forward. It was proposed that a correspondence group be established to review and possibly propose revisions to the resolution to be submitted to RA-19. RAG applauded the proposal to appoint Mr. Alexander Vassiliev as the Chairman of the Correspondence Group and approved the Terms of Reference of the Group.

RAG noted the draft rolling Operational Plan of the ITU-R for the period 2020-2023, and commented on the outcomes and outcome indicators. The meeting called on the Bureau to review what is being measured and how best the items contained in the report could be reflected in the future operational plans. RAG requested the Director to review the proposed draft operational plan for 2020 if possible with new proposals.

RAG urged study group counsellors to continue to draw the attention of participants of their respective study groups to the issues on Inter-sector coordination. RAG noted the mapping proposed by TSAG and ITU-T study groups. The mapping of ITU-D study groups 1 and 2 questions with those of ITU-R relevant study groups was posted on the Inter-Sector Coordination Group (ISCG) website.

# 6 Publications, seminars/workshops, communication and outreach

The purpose of the activities relating to publication, organization and participation in seminars and workshops, and more generally communication and outreach, is to ensure that the outputs produced by the activities of the ITU-R Sector (regulations, recommendations, reports and handbooks) are disseminated worldwide and familiar to the ITU membership, and more generally to all stakeholders on spectrum.

## 6.1 Publications

### 6.1.1 Regulatory publications

During the 2016-2019 time-frame, the preparation of the regulatory publications followed the standard pattern, as foreseen in the Operational Plan, notably:

– the edition of the Radio Regulations reflecting the changes decided by WRC‑15 was published during the fourth quarter of 2016 in all ITU languages;

– the consolidated version of the Rules of Procedure reflecting the WRC‑15 decisions was published during the first quarter of 2017. Since then, four updates have been published with modifications decided by RRB. The Rules of Procedure and their updates are published in all ITU languages.

Table 6.1.1-1 summarizes the Bureau’s activities on other statutory publications resulting from the application of the Radio Regulations in the period 2016-2019.

Table 6.1.1-1

Summary information regarding the publications resulting from the application of the Radio Regulations

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 2016 | 2017 | 2018 | 2019Note |
| BR IFIC (including ILF and all plans) | 25 issues (on DVD‑ROM) | 25 issues (on DVD‑ROM) | 25 issues (on DVD‑ROM) | 25 issues (on DVD‑ROM) |
| HFBC schedules | 11 issues (on CD-ROM) | 11 issues (on CD-ROM) | 11 issues (on CD-ROM) | 11 issues (online) |
| Preface to the BR IFIC (Space and terrestrial) | 25 issues (incorporated within each BR IFIC) | 25 issues (incorporated within each BR IFIC) | 25 issues (incorporated within each BR IFIC) | 25 issues (incorporated within each BR IFIC) |

Note: the expected number of publications for the entire year 2019.

## 6.1.2 Service publications

#### 6.1.2.1 Background and general observations

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

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.

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 MID).

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

Two editions of List IV have been prepared during this reporting period. This List is composed of a paper booklet containing the Preface and Reference tables and a CD‑ROM (in pdf format) containing the information notified to ITU, on coast stations and their services, such as public correspondence (CP), Rescue Coordination Centres (RCC), search and rescue (SAR) agencies, NAVINFO, pilot stations, VTS and AIS stations, etc.

Information pertaining to this list is also made available via the online information system ITU Maritime mobile Access and Retrieval System (MARS).

The ITU MARS webpage has been enhanced to allow administrations to download files containing all their coast stations notified to the ITU and to search and retrieve coast station(s) faster and more efficiently.

The Bureau continues to provide, every six months, a compilation of all changes notified to the ITU.

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

Four editions of List V have been prepared during this reporting period. This List is composed of a paper booklet containing the Preface and Reference tables and a CD‑ROM (in pdf format and MS access database) containing the information notified to ITU on ship stations, coast stations assigned an MMSI, 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.

The feature to download, via ITU MARS, a compilation of all changes notified to the ITU, continues to be provided every three months.

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

Two editions of List VIII have been prepared during this reporting period. This List is composed of a paper booklet containing the Preface, Reference tables and a CD ROM (in pdf format) containing the information notified to BR on International Monitoring Stations (Terrestrial and Space) and the different types of measurements covered by these stations as well as contact information for centralizing offices. An application is under development to improve the software application that supports the publication of List VIII and maintains the database of monitoring stations.

#### 6.1.2.5 List of service publications issued

Table 6.1.2.5-1 below summarizes the different publications prepared and delivered during the period 2016-2019:

Table 6.1.2.5-1

Summary information regarding the service publications issued in the period 2016-2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 2016 | 2017 | 2018 | 2019 |
| List IV (List of Coast Stations and Special Service Stations) | - | Edition of 2017(November) | - | Edition of 2019(November) |
| List V (List of Ship Stations and Maritime Mobile Service Identity Assignments) | Edition of 2016(March) | Edition of 2017(March) | Edition of 2018(March) | Edition of 2019(March) |
| List VIII (List of International Monitoring Stations) | Edition of 2016(December) | - | - | Edition of 2019(December) |
| Maritime Manual | Edition of 2016(October) | - | - | - |

### 6.1.3 Study Groups and other publications

During the study period 2015-2019, the preparation of ITU‑R Study Groups and other publications followed the standard pattern, as foreseen in the Operational Plan, notably:

– ITU-R Recommendations: 183 were published (posted) on the ITU website in English (E). All Recommendations issued from 2005 to 2018 are available in the six ITU languages (A/C/E/F/R/S), and translation to the remaining five languages is in progress for those Recommendations issued since 2018.

– ITU-R Reports: 176 reports were published (posted) on the ITU website (E) during the period of 2015-2018.

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

– Computer-aided Techniques for Spectrum Management (CAT)

– National Spectrum Management

– Handbook on Global Trends in International Mobile Telecommunications

– Guidance for bilateral/multilateral discussions on the use of frequency range 1 350 MHz-43.5 GHz by fixed service systems

– Handbook on Digital Terrestrial Television Broadcasting networks and systems implementation

– Use of Radio Spectrum for Meteorology: Weather, Water and Climate Monitoring and Prediction

– Digital Terrestrial Television Broadcasting Networks and Systems Implementation.

– Other publications (A/C/E/F/R/S):

– Book of ITU-R Resolutions 2015

– Provisional final Acts WRC-15

– Final Acts WRC-15

– Rules of Procedure - Edition of 2017

– ITU-R Rules of Procedure 2017 - Update 1

– ITU-R Rules of Procedure 2017, Update 2

– ITU-R Rules of Procedure 2017, Update 3

– ITU-R Rules of Procedure 2017, Update 4

### 6.1.4 ITU-R Publications Downloads.

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

By Decision 12 (Guadalajara, 2010), PP-10 expanded the free online access policy to include, *inter alia*, ITU‑R Recommendations and Reports. Later on, Council 2012 Decision 571 provided free online access to the Radio Regulations to the general public for a trial period until PP-14, and Council 2013 revised Decision 571 and extended this free online access to include the ITU-R Handbooks on radio-frequency spectrum management[[4]](#footnote-4) to the general public on a permanent basis. Council 2014 further revised Decision 571 to provide free online access to the Radio Regulations and the Rules of Procedure to the general public on a permanent basis., PP-14, in adopting Decision 12 (Rev. Busan, 2014), confirmed that the free online access should be provided on a permanent basis. Finally, following the BR Director’s decision in January 2017 the free access was extended to all ITU-R Handbooks.

In conclusion, the ITU-R publications now available free of charge (for download) to the general public on a permanent basis are the following:

– Radio Regulations, latest version: RR Ed. 2016, with decisions from WRC-15

– Rules of Procedures, latest version RoP Ed. 2017 +Update 4 (June 2018)

– ITU-R Recommendations (16 Series, 1,175 Recommendations in Force, as 06/2019).

– ITU-R Reports (13 Series, 561 Reports in Force, as 06/2019)

 ITU-R Handbooks (38 Handbooks in force)

The impact of these Decisions is well reflected in the number of deliveries of such publications, as shown next.

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

Concerning these regulatory documents, Table 6.1.4.1-1 compares the number of sales for the RR‑2012 edition (released in December 2012, with decisions from WRC-12) and the RR-2016 edition (released in December 2016, with decisions from WRC-15), as of December 2018. It illustrates the positive impact of this policy on the global dissemination of the Radio Regulations. Also, downloads for 2016 version of the RR were made from 130 countries, representing 67 per cent of ITU Membership. This comparison shows that the free downloads had no impact on the level of sales.

Table 6.1.4.1-1

Comparison of the number of deliveries of the Radio Regulations and RoP since 2018

|  |  |  |
| --- | --- | --- |
|  | Sold | Free Download\* |
|  | 19,594 | 39,653 |
| *RR-12 (48 months deliveries)* | 6,565 | 5,342 |
| *RR-16 (since December 2016)* | 26 | 3,776 |
| *RoP 2012 (since Council 2014 decision)* | - | 1,003 |
| *RoP 2017* |  |  |

*\*Up to Sept. 2018*

#### 6.1.4.2 ITU-R Recommendations

As a result of the free online access policy, ITU-R Recommendations are disseminated worldwide, becoming a universal reference. In a 57-month period (January 2014 to September 2018), more than six million downloads of ITU-R Recommendations from ITU website were recorded. Table 6.1.4.2 1 summarizes their distribution by year and series. At this time, there are 1,175 ITU-R Recommendations in force, hence the yearly average number of downloads is over one thousand per Recommendation.

Table 6.1.4.2-1

Distribution of ITU-R Recommendations

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| SERIES | 2015 | 2016 | 2017 | 2018\* | TOTAL | 2018% |
| **P** | 187,575 | 364,869 | 316,019 | 280,201 | **1,148,664** | **20.6%** |
| **M** | 178,190 | 301,869 | 269,185 | 254,048 | **1,003,292** | **18.0%** |
| **BT** | 155,065 | 235,758 | 208,528 | 182,366 | **781,717** | **14.0%** |
| **F** | 109,187 | 187,344 | 147,502 | 136,164 | **580,197** | **10.4%** |
| **SM** | 102,711 | 187,123 | 152,305 | 135,637 | **577,776** | **10.4%** |
| **BS** | 77,553 | 135,300 | 131,647 | 107,795 | **452,295** | **8.1%** |
| **S** | 63,020 | 123,412 | 103,445 | 90,408 | **380,285** | **6.8%** |
| **SA** | 25,278 | 36,547 | 32,071 | 34,735 | **128,631** | **2.3%** |
| **V** | 15,135 | 22,757 | 25,168 | 25,301 | **88,361** | **1.6%** |
| **BO** | 18,651 | 32,637 | 28,578 | 21,263 | **101,129** | **1.8%** |
| **RS** | 16,055 | 20,044 | 18,827 | 19,778 | **74,704** | **1.3%** |
| **SF** | 13,704 | 22,779 | 18,354 | 17,323 | **72,160** | **1.3%** |
| **TF** | 16,662 | 20,511 | 15,181 | 15,584 | **67,938** | **1.2%** |
| **BR** | 11,240 | 15,632 | 16,844 | 15,014 | **58,730** | **1.1%** |
| **RA** | 7,744 | 12,514 | 9,589 | 9,100 | **38,947** | **0.7%** |
| **SNG** | 3,464 | 4,809 | 3,221 | 3,049 | **14,543** | **0.3%** |
| **TOTAL** | **1,001,234** | **1,723,905** | **1,496,464** | **1,347,766** | **5,569,369** | **100.0%** |

*\*Up to Sept. 2018*

As indicated in the table, near 40 per cent of downloads come from Series P and M (Propagation, Mobile), which illustrates the worldwide recognition of ITU-R works on these matters.

#### 6.1.4.3 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. In a 57-month period (January 2014 to September 2018), more than 1 million downloads of ITU-R Reports from ITU website were recorded. Table 6.1.4.3-1 summarizes their distribution by year and series. At this time, there are 561 ITU-R Reports in force, hence the yearly average number of downloads is near 500 per Report.

Table 6.1.4.3-1

Distribution of ITU-R Reports

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **SERIES** | **2015** | **2016** | **2017** | **2018\*** | **TOTAL** | **2018%** |
| **M** | 87,523 | 112,794 | 76,531 | 63,114 | **339,962** | **31.8%** |
| **SM** | 57,537 | 79,217 | 53,616 | 45,439 | **235,809** | **22.1%** |
| **BT** | 51,911 | 57,135 | 44,340 | 40,327 | **193,713** | **18.1%** |
| **BS** | 18,803 | 25,988 | 24,015 | 15,503 | **84,309** | **7.9%** |
| **P** | 12,828 | 16,268 | 12,572 | 9,315 | **50,983** | **4.8%** |
| **BO** | 12,567 | 15,321 | 10,541 | 7,520 | **45,949** | **4.3%** |
| **F** | 11,097 | 15,330 | 10,142 | 7,282 | **43,851** | **4.1%** |
| **S** | 6,701 | 8,330 | 6,152 | 5,177 | **26,360** | **2.5%** |
| **SA** | 4,557 | 5,886 | 3,764 | 2,966 | **17,173** | **1.6%** |
| **RS** | 4,274 | 4,148 | 3,292 | 2,502 | **14,216** | **1.3%** |
| **RA** | 3,196 | 4,316 | 3,106 | 2,860 | **13,478** | **1.3%** |
| **SF** | 545 | 506 | 303 | 266 | **1,620** | **0.2%** |
| **BR** | 65 | 66 | 65 | 35 | **231** | **0.0%** |
| **TOTAL** | **271,604** | **345,305** | **248,439** | **202,306** | **1,067,654** | **100.0%** |

*\*Up to Sept. 2018*

As indicated in the table, more than 30 per cent of downloads are of Series M (Mobile), which illustrates the worldwide recognition of ITU-R works on this matter.

#### 6.1.4.4 ITU-R Handbooks

Table 6.1.4.4 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 16,000 downloads were registered. Also, the number of downloads originate from the 193 ITU countries. At this time, there are 42 ITU-R Handbooks published, of which 38 are in force, one is merged and three are suppressed but still available at the ITU website.

Table 6.1.4.4-1

Distribution of ITU-R Handbooks 2014-2018

|  |  |  |
| --- | --- | --- |
|  | Sales | Free Downloads  |
| Handbook | 2014-2016 | 2017 | 2018 | 2014-2016 | 2017  | 2018\* |
| Spectrum Management Series | 96 | 31 | 9 | 4,750 | 1,162 | 4,839 |
| Other Handbooks | 503 | 80 | 21 | - | 2,084 | 8,180 |
| **Grand Total** | **96** | **31** | **30** | **4,750** | **3,246** | **13,019** |

*\*Up to Sept. 2018*

### 6.1.5 Navigation and analysis tools for ITU-R electronic publications

#### 6.1.5.1 Radio Regulations tools

The Bureau has developed software tools to facilitate the use and review of the Radio Regulations and it continues to update and maintain them:

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. Yearly free updates will be released to incorporate the latest available RoP 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 website. A new release of the package will be provided, based upon WRC-19 decisions and the RR-20 Edition of the Radio Regulations and associated RoP. All software and data updates will be provided regularly to the subscribers.

#### 6.1.5.2 ITU-R Recommendations, Reports, Resolutions and Questions database search tool

The development of the database search tool, initiated in 2014, has been completed in 2015, and now available to general public. The tool enables ITU-R documents, Recommendations, Questions, Reports, Handbooks, Resolutions to be searched and filtered by categories such as the radiocommunication service(s) and applicable frequency band.

## 6.2 Seminars and workshops

### 6.2.1 World and Regional Radiocommunication Seminars (WRS, RRS)

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 by WRC-15 and the associated Rules of Procedure. This cycle encompasses the biennial World Radio Seminars, WRS, complemented by a set of Regional Radio Seminars, RRS. An analysis of the participation in WRSs and RRSs from 2016-2018 shows that these two types of seminars complement each other, as follows

– In two WRSs: 855 participants from over 115 countries

– In eleven RRSs: 1034 participants from over 140 countries

Total: 13 seminars, 1889 participants from over 175 countries.

During this period the BR provided more than 100 partial fellowships for RRSs and over 60 full fellowships for WRSs (one per administration for eligible countries).

#### 6.2.1.1 World Radiocommunication Seminars (WRS)

World Radiocommunication Seminars focused on the regulatory aspects of the use of the radio-frequency spectrum and satellite orbits, in particular the application of the provisions of the ITU Radio Regulations.

Since WRC-15, the biennial World Radiocommunication Seminar were held in Geneva:

– **WRS-16**, from 12 to 16 December 2016, attended by 370 participants from 109 countries;

– **WRS-18**, from 3 to 7 December 2018, attended by 485participants from 98 countries.

The presentations and discussions during both events were in the six official languages of the ITU with simultaneous interpretation facilities. Three-day workshops were held in parallel for both terrestrial and space services. Groups were divided up in accordance with the language requirements and available facilities. WRS-16 and WRS-18 were conducted in a “paperless” environment. The proceedings are available on the ITU website: <http://www.itu.int/ITU-R/go/seminars>.

The BR has provided full fellowships for WRSs (limited to one per administration for eligible countries). More than 60 full fellowships were granted.

#### 6.2.1.2 Regional Radiocommunication Seminars (RRS)

As a complement to the biennial Word Radiocommunication Seminars, the BR has implemented a 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, and, in particular, the application of the provisions of the ITU Radio Regulations.

Regional seminars include two days of theoretical sessions and two days of workshops on terrestrial and space services, which may be in parallel or in series according to the specific requirements of the region. RRSs are complemented with a one-day forum, dedicated to spectrum-related topics of particular interest to the region.

Table 6.2.1.2-1 provides a summary of the eleven RRSs which were held since WRC-15. These seminars were generally hosted by the government, the regulator or the spectrum management authority in the country, in cooperation with the relevant regional organizations and the ITU regional/areas offices.

Table 6.2.1.2-1

ITU Regional Radiocommunication Seminars (2016-2019)

| **Date** | **RRS** | **Place** | **Host** | **Cooperation** | **Forum Topics** | **Languages** | **Participants/administrations** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2016** |
|  | **RRS-16-Americas** | Port of Spain, Trinidad and Tobago | Caribbean Telecommunications Union (CTU)  | Inter-American Telecommunications Commission (CITEL) ITU Americas Office | WRC-15 outcomes and WRC-19 Agenda: Regional Challenges and Opportunities for Spectrum Harmonisation | E | 31/14 |
|  | **RRS-16-Asia-Pacific** | Apia, Samoa | ICT Ministry | Pacific Islands Telecommunications Association (PITA)ITU Asia and the Pacific Office | Bridging the Digital divide on the region: role of Radiocommunications Technologies" | E | 78/15 |
| **2017** |
|  | **RRS-17 Africa** | Senegal | Ministère des Postes et Télécommunications (MPT) and the Autorité de Régulation des Télécommunications et de la Poste (ARTP) | African Telecommunications Union (ATU)ITU African Office | 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)ITU Americas Office | 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/) | Asia-Pacific Telecommunity (APT)ITU Asia and the Pacific Office | Transition to 5G in the Region | E | 140/22 |
|  | **RRS-17 Arab** | Oman | [Telecommunications Regulatory Authority (TRA)](https://www.tra.gov.om/)  | Arab Spectrum Management GroupASMGITU Arab States Office | WRC-19 Agenda: challenges and opportunities for Arab Countries | A/E | 153/15 |
| **2018** |
|  | **RRS-18 Asia-Pacific** | Bhutan | Ministry of Information and Communications (MoIC)  | Asia-Pacific Telecommunity (APT)ITU Asia and the Pacific Office | Radiocommunication Systems evolution: challenges and opportunities for the Region | E | 70/15 |
|  | **RRS-18 Americas** | Costa Rica | Ministerio de Ciencia Tecnología y Telecomunicaciones of Costa Rica (MICITT) | Comisión Técnica Regional de las Telecom (COMTELCA)Inter-American Telecommunications Commission (CITEL)ITU Americas Office | Spectrum Management: Challenges ahead | S/E | 60/13 |
| **2019** |
|  | **RRS-19-Africa** | South Africa | Department of Telecommunications and Postal Services (DTPS) and the Independent Communications Authority (ICASA) | African Telecommunications Union (ATU)ITU African Office | 5G Ecosystem: challenges and opportunities for the Region | E/F | 135/36 |
|  | **RRS-19 for CIS and neighbouring countries,** | Uzbekistan | Ministry for Development of Information Technologies and Communications | Regional Commonwealth in the Field of Communications (RCC) Regional Coordination Council (RCC) | Trends in Spectrum Management and Emerging Radiocommunication Technologies | R | 46/7 |
|  | **SRME-19** (for Eastern Europe) | Albania | Ministry of Infrastructure and Energy | Regional Coordination Council (RCC)ITU Eastern Europe Office | 5G Ecosystem: Challenges and Opportunities for Europe | E | 66/12 |

The BR has provided partial fellowships for RRS (only one per administration for eligible countries). More than 100 partial fellowships were granted.

### 6.2.2 Other Events

2016 marked the [110th anniversary ITU Radio Regulations (1906-2016)](http://www.itu.int/en/ITU-R/RR110/) distinguished by distinct communications and anniversary branding (RR110) distributed throughout the year to ITU Membership, partners, media and to the general public. Anniversary celebrations were held in Geneva on 12 December 2016 during the Opening Plenary of the World Radiocommunication Seminar 2016 (WRS-16), in the presence of the membership and special guests, and included addresses by the Deputy Secretary General and the Director of the Radiocommunication Bureau.

2017 marked the Washington Int. Radiotelegraph Convention [90th anniversary of the CCIR\*/ITU-R Study Groups'](https://www.itu.int/en/ITU-R/CCIR90/Pages/default.aspx), a testimony of global collaboration to produce universally applied regulations, standards and best practices and enable the sustainable development of the wireless ecosystem.

As part of the celebrations, a series of events have taken place during the anniversary year of 2017, including:

– A High-level session of the **WSIS Forum** on "ITU enabling the wireless ecosystem" showcasing ITU-R Study Groups achievements at the Ministerial level which was held on 12 June, 16h30 - 18h15 at ITU Headquarters, Geneva, Switzerland.

– A dedicated session at **ITU TELECOM World 2017**"Enabling and shaping the wireless ecosystem" which was held on 27 September, 16h45 - 18h00 in Busan, Republic of Korea.

– A celebration in honour of the **90th Anniversary of the CCIR/ITU-R Study Groups** which was held on 21 November, 16h00 - 18h00 during the [**1st ITU Inter-regional Workshop on WRC-19 Preparation**](https://www.itu.int/en/ITU-R/conferences/wrc/2019/irwsp/Pages/2017.aspx) at ITU Headquarters, Geneva, Switzerland.

Support was also provided to other ITU seminars related to topics such as spectrum management, space radiocommunication applications, WRC-19 preparation, etc. Events organized within ITU-R can be found at: <http://www.itu.int/ITU-R/go/seminars>. Table 6.2.2-1 illustrates this activity.

Other relevant events during the period include:

– Internet of Things Workshop

– International Satellite Symposiums: 5 Symposia

– Small satellite Symposia: 2 events

– ITU WRC-19 Regional Workshop for Region 2

– ITU Regional Seminar for CIS and Europe "Development of modern radiocommunication ecosystems"

– ITU Regional Workshop on “Furthering IMT Development: Policy, Spectrum Valuation and Auctions in the Arab Region”

Table 6.2.2-1 summarizes the missions carried by BR staff for the above activities since WRC-15. For completeness, this also includes the participation of BR staff in providing assistance to the membership.

Table 6.2.2-1

Participation of BR staff to events disseminating information

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | 2015 | 2016 | 2017 | 2018 | TOTAL |
| Missions | Countries  | Missions | Countries  | Missions | Countries  | Missions | Countries  | MISSIONS |
| ***SPECIALIZED UN AGENCIES***  | 24 | 9 | 33 | 13 | 23 | 11 | 21 | 11 | 101 |
| ***REGIONAL TELECOMMUNICATION ORGANIZATIONS***  | 74 | 34 | 57 | 32 | 49 | 37 | 46 | 37 | 226 |
| ***NON-ITU CONFERENCES & SYMPOSIA***  | 57 | 45 | 83 | 40 | 51 | 32 | 58 | 44 | 249 |
| ***ITU SEMINARS, WORKSHOPS & MEETINGS*** | 33 | 19 | 39 | 19 | 27 | 26 | 21 | 19 | 120 |
| ***ASSISTANCE REQUESTS*** | 14 | 7 | 8 | 5 | 8 | 8 | 6 | 5 | 36 |
| ***OTHER EVENTS*** | 31 | 14 | 14 | 10 | 15 | 11 | 20 | 6 | 80 |
| **TOTAL** | **233** | **128** | **234** | **119** | **173** | **125** | **172** | **122** | **812** |

## 6.3 Communication and Outreach

### 6.3.1 Membership

Table 6.3.1-1 shows the evolution of the number of ITU-R Sector Members, Associates and Academia during the period of January 2016 to August 2019.

Table 6.3.1-1

**Evolution of the ITU-R membership since 2015**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   | 2016 | 2017 | 2018 | 2019\* | 2015 vs 2019\* | % Increase |
| **Sector Members** | 266 | 264 | 264 | 269 | +3 | 1% |
| **Associates** | 19 | 21 | 21 | 22 | 4 | +16% |
| **Academia** | 107 | 125 | 155 | 159 | +82 | +49% |

\**Until August 2019*

### 6.3.2 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 interest of membership), the Bureau works in close collaboration with the Corporate Communications Division (CCD) and ITU Press Office, the membership Department and other relevant Departments of the General Secretariat. This work has included several ITU Inter-Sectoral meetings: WSIS Implementation Task Force, Communications Groups, Web Editorial Board, Emerging Trends and Gender Task Force Group.

The following ITU News Articles have been issued as a build-up to the Special Edition for WRC-19 which will be issued during the conference:

– **Terrestrial wireless communications** - How decisions taken at the World Radiocommunication Conference 2019 may impact the appropriate protection and availability of spectrum for terrestrial wireless communications.

– **Evolving satellite communications** - How decisions taken at the World Radiocommunication Conference 2019 may impact the appropriate protection and availability of spectrum for satellite communications.

– **Monitoring our changing planet** - How decisions taken at the World Radiocommunication Conference 2019 can provide the appropriate protection and availability of spectrum for space science.

### 6.3.3 Web management

The BR continued to support the ITU-R Sector strategic goals with communications issued through the BR website www.itu.int/ITU-R/, top-level pages 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 social media on the ITU-R NEWSROOM targeting the ITU membership, ITU-R Study Groups participants and delegates, academia members, specialized technical magazines, research institutions, media, ITU staff and the general public.

The BR Director’s corner was redesigned to include a visitors section with photos, the speeches and presentations by the Director as well as the meetings schedule, videos and photos. A [WRC-19 Newsroom](https://www.itu.int/en/newsroom/wrc-19/Pages/default.aspx) was designed for membership, delegates, exhibitors, media and the general public etc. to keep regularly informed about the issues discussed and decided at the ITU World Radiocommunication Conference 2019 ([WRC-19](https://www.itu.int/en/ITU-R/conferences/wrc/2019/Pages/default.aspx) ) meeting in Sharm el-Sheikh, Egypt, from 28 October to 22 November, the Radiocommunication Assembly 2019 ([RA-19](https://www.itu.int/en/ITU-R/conferences/RA/2019/Pages/default.aspx)) from 21 to 25 October, and the first Session of the Conference Preparatory Meeting for WRC-23 ([CPM23-1](https://www.itu.int/en/ITU-R/study-groups/rcpm/Pages/cpm-19.aspx)) from 25 to 26 November 2019. A combined 3,500+ participants are expected to attend the WRC-19 and RA-19, including delegates from the 193 ITU Member States as well as 267 members of the ITU Radiocommunication Sector ([ITU-R](https://www.itu.int/en/mediacentre/backgrounders/Pages/itu-r-managing-the-radio-frequency-spectrum-for-the-world.aspx) ) representing international organizations, equipment manufacturers, network operators and industry forums, who attend as observers. Social media hashtags are in place: [#ITUWRC](https://twitter.com/hashtag/ITUWRC?src=hash) and [#WRC19](https://twitter.com/search?q=%23WRC19&src=typd).

### 6.3.4 Frequently Asked Questions (FAQ) and Backgrounders

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;

– Digital 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>.

In addition to the FAQ, the BR has recently developed Backgrounders on key subjects of interest by media outlets especially during the WRC-19, as follows:

– [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)

– [High-Altitude Platform Systems (HAPS)](https://www.itu.int/en/mediacentre/backgrounders/Pages/High-altitude-platform-systems.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)

– [Satellite issues: Non-GSO FSS satellite systems](https://www.itu.int/en/mediacentre/backgrounders/Pages/Non-geostationary-satellite-systems.aspx)

– [Satellite issues: Small SATS: Nano and Pico - short duration missions](https://www.itu.int/en/mediacentre/backgrounders/Pages/non-GSO-satellite-systems-with-short-duration-missions.aspx)

# 7 Assistance to Member States

## 7.1 Assistance to administrations of developing countries

In the period between WRC‑15 and WRC‑19, the Bureau provided assistance to the administrations of developing countries by:

– Supporting national spectrum management activities and providing technical assistance in the field of space radiocommunication;

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

– 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.

– Participation in capacity building seminars on satellite communications.

Table 6.2.2-1 illustrates this activity.

## 7.2 Assistance to Regional Groups

In the period between WRC‑15 and WRC‑19, following the request of assistance from the Regional Groups ATU and ASMG in implementing the decisions of WRC-12 and WRC-15 on the allocation of the 700 and 800 MHz band, the Bureau provided technical expertise and the associated software to enable ATU and ASMG Administrations to plan additional channels in the frequency band 470‑694 MHz in preparation to the transition to digital TV and the allocation of these bands to the mobile service.

Assistance was also provided by the Bureau in support of frequency coordination between the administrations of smaller groups of countries.

## 7.3 Assistance to other groups of countries

### 7.3.1 Assistance to the administrations of Central America and Caribbean (CAC) Region

The Bureau, in collaboration with CITEL, COMTELCA and CTU, organized and successfully completed the assistance to 30 administrations from Central America and Caribbean (CAC) Region, concerning the use of the VHF band (174-216 MHz) and the UHF band (470-806 MHz).

This assistance was provided through CAC frequency coordination meetings, taking place between March 2017 to September 2018, as well as compatibility analysis performed by the Bureau between the meetings. The assistance was intended to facilitate the processes of transition from analogue to Digital Television (DTT) and the allocation of the Digital Dividend. It lasted 18 months and was finalized at the 4th and final coordination meeting held from 11 to 14 September 2018.

The Reference List of coordinated digital assignments was established. The percentage of assignable channels, corresponding to the submitted digital requirements exceeded 94% in the UHF band and 96% in the VHF band for the countries involved.

The achieved results involved the following activities:

– MIFR update of missing or erroneous data for CAC countries for television broadcasting assignments;

– Elaboration of the new Report ITU-R BT. 2432-0 – Technical criteria used for DTT planning in Central American and Caribbean Region, adopted by SG6 at its meeting in October 2018;

– Adaptation and enhancement of the GE06Calc Compatibility analysis to the region, to enable to:

• take into account the recorded fixed and mobile assignments in the Master Register;

• perform Digital-to-Digital, Digital-to-Analogue, Analogue-to-Digital, Digital-to-Fixed and Mobile and Fixed and Mobile to Digital compatibility analysis;

• adopt at the end of the coordination process the Reference List of assignable and coordinated assignments;

• protect this Reference List, using a fully automated system for the compatibility analyses calculations via eTools, which examines all incoming analogue assignments against the records in the Reference List.

### 7.3.2 Assistance to the Black sea, Caspian sea and Central Asia Group on frequency coordination matters in the band 470-862 MHz

The Bureau organized and provided technical assistance for the 2nd meeting of the Black Sea, Caspian Sea and Central Asia Group on frequency coordination matters in the UHF band in March 2017. The administrations of Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Russian Federation, Turkey and Uzbekistan participated in the meeting. The current situation and expected developments in utilization of UHF band were discussed. The Terms of Reference of the Group was adopted. Preliminary draft recommendations and criteria for seeking additional channels for DTT in the frequency band 470-694 MHz were established. However, no subsequent meetings have taken place afterwards.

## 7.4 Treatment of cases of harmful interference

### 7.4.1 General overview

In the application of the procedures of Article **15** of the Radio Regulations, the Bureau has treated all reports of harmful interference as a matter of urgency, particularly where safety services were involved. Each reported case is normally handled by the Bureau within 48 hours from its receipt. Some cases were reported to the RRB, as requested by administrations whose services suffered interference. For some cases, the Bureau received declaration, from affected administrations, claiming the cases were closed. Table 7.4.1‑1 summarizes statistical information regarding terrestrial systems and Table 7.4.1-2 with respect to cases affecting space services.

Table 7.4.1-1

Statistical information regarding the treatment of cases of harmful interference affecting terrestrial services

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 2016 | 2017 | 2018 | 2019 (till 30.06) |
| Cases submitted for BR information  | 38 | 40 | 21 | 12 |
| Cases of assistance to administrations | 27 | 13 | 20 | 11 |

Table 7.4.1-2

Statistical information regarding the treatment of cases of harmful interference affecting space services

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **2016** | **2017** | **2018** | **2019 (till 30.06)** |
| Cases submitted for BR information  | 23 | 22 | 42 | 22 |
| Cases of assistance to administrations | 3 | 8 | 4 | 2 |

In-depth analysis of the cases of harmful interference affecting space services is contained in Annex 2 to this document.

### 7.4.2 Developments regarding specific cases of harmful interference

#### 7.4.2.1 Harmful interference caused by Italy to the broadcasting services (sound and television) of its neighbouring countries

In November 2016, the Italian Administration informed the Bureau about the successful completion of the switch-off of the television transmissions on 61 frequencies that were causing interference, with the exception of those located in the Province of Marche, which had been affected by earthquakes. In January 2017, the switch-off was completed in the Province of Marche.

With respect to VHF sound broadcasting, the BR continues to monitor the cases of harmful interference caused by Italian sound broadcasting stations to its neighbouring countries and reports on the evolution of such cases to every RRB meeting.

Upon the requests of the RRB, the Bureau met several times with the Italian authorities and broadcasting operators and participated in multilateral meetings between Italy and its neighbouring administrations. Such meetings took place in May 2016, October 2017, June 2018 and July 2019. The meetings evaluated the situation and discussed possibilities to resolve the harmful interference caused by Italian VHF sound broadcasting stations to its neighbouring countries.

At the October 2017 multilateral meeting, the affected administrations presented priority lists of FM stations experiencing harmful interference. Based on these lists, in September 2018 BR produced a document indicating the status of FM stations causing harmful interference, those being interfered with, and the progress achieved. The Bureau periodically updates this document.

Concerning FM sound broadcasting, some administrations reported little improvement while others have observed no changes. This issue still seems to take significant time to be definitively settled.

As for T-DAB, the Administration of Italy committed to address the interference from a legal, regulatory, technical and operational standpoints. It put into operation a legal framework (2017 law) which forbids the operation of T-DAB stations on non-coordinated frequencies. However, three administrations have already complained about interference on their allotted T-DAB channels. Italy informs that these interference are caused from DAB stations authorized for “experimental tests” some years ago. Additionally, it stated that, after clearing the 700 MHz band, it would be in a position to eliminate all DAB interferences, hopefully in 2021 for the Adriatic region.

All the related monitoring and interference reports regularly received by the BR are available on the ITU website at <http://www.itu.int/md/R11-MMHI-SP/en>.

# 8 Cooperation

## 8.1 Cooperation with ITU‑D

In addition, The BR has maintained close collaboration 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, 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 to be 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. Within the framework of Resolution ITU R 11-5 (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 WTDC Resolution 9.

In view of some of the needs of developing countries, the production of Handbooks has continued to be recognized as an important 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).

In addition, as reported in Sections 6 and 7 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 other relevant international organizations and national authorities.

In addition, the BR also participated in:

• Meetings and Workshops of Experts on WTDC Resolution 9 (Rev. Buenos Aires, 2017).

• BDT assistance program dealing with the development of regulations for maritime wireless communication for the Ministry of Communications and Information Technology (MCIT) of Indonesia.

### 8.1.1 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 (in 2015, 2017 and 2019) with the organization of, and participation in, sessions related to spectrum management, with emphasis in 5G and new spectrum management trends.

In 2018 the GSR agenda did not include a session on spectrum-related topics. BR has coordinated with BDT the inclusion of the Spectrum management-related topics in the agenda of GSR-19 and sessions were successfully conducted at this edition.

### 8.1.2 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 is under review with the objective of aligning it to regulators way of classifying the mobile broadband technologies and include a new section on IMT frequencies national allocation and assignments, while considering KPIs on IMT National Spectrum Allocations and Assignments.

### 8.1.3 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 2018, the BR participated in the meetings of Expert Group on Telecom-ICT Indicators (EGTI), and contributed in driving the discussions of the Ad-Hoc Group in the development of a new indicator on IMT National Spectrum Allocations and Assignments.

The BR made presentations during WTIS-15, WTIS-16 and WTIS-17. During WTIS-18, the BR participated in discussions relating to IMT National Spectrum Allocations and Assignments, which endorsed the recommendations from the EGTI.

### 8.1.4 Spectrum Management Training Programme (SMTP)

BR has maintained close collaboration 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, 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 to be 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 9.2.4). 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.

In view of some of the needs of developing countries, the production of Handbooks has continued to be recognized 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). In 2016, improvements were integrated on the basis of feedbacks. In 2017 a comprehensive revision was made, which provided ITU the opportunity to establish working relationship with some regulators in Latin-America, interested in an edition of SMTP specifically oriented to their Staff.

In 2018, BR and BDT took actions towards implementing special editions of SMTP. These actions are still in progress. In 2019 the BR plans to review and revise the material contained in the current SMTP.

## 8.2 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.

Therefore, there continues to be a requirement for close coordination on the various topics being addressed by ITU-T that impinge on radiocommunication issues in order to reduce the potential for overlap, duplication and avoid redundancies.

– BR representatives attended the World Telecommunication Standardization Assembly 2016.

– BR also participated in the Kaleidoscope academic conference organized by ITU-T during ITU Telecom World.

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

The Bureau continues its close cooperation with the relevant international and regional organizations dealing with the use of spectrum (APT, ASMG, ATU, CEPT, CITEL and RCC), broadcasting organizations (ABU, ASBU, EBU and HFCC) or more generally with the use of radiocommunication services (e.g. ITSO, ESOA, GVF, GSMA) by organizing, promoting and participating in events to build capacity on the use of the RRs, including WRS and RRS, as indicated in Section 9.2.

The Bureau continues to participate in the activities of the Global Standards Collaboration (GSC). Involvement with the 3GPP and IEEE has been maintained, as well as several regional standardization organizations, given their importance and relevance to the work of Study Group 5, in particular the activities on IMT-2020. Other notable areas of liaison with Study Group activities include those with the World Meteorological Organization, the World Health Organization, ISO and IEC (including CISPR), Space Frequency Coordination Group and several others on an ad-hoc basis.

The Bureau ensured liaison and cooperation with the UN Committee on the Peaceful Uses of Outer Space (UN-COPUOS), the International Maritime Organization (IMO), the International 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.

Annex 1

WRC-19 Agenda Item 7 – Issue E – Notices of satellite networks submitted
under § 6.1 of Article 6 of RR Appendix 30B

The draft new Resolution proposed under WRC-19 agenda item 7, Issue E, contains a statistic of the new notices of satellite network submitted under § 6.1 of Article 6 of RR Appendix 30B.

The Bureau hereby submits the updates of these statistics in order to cover the period of time 2012 – 2019/Q2.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Request for conversion without change of initial allotment national service area | Request for conversion with changes within the envelope of initial allotment national service area | Request for conversion with changes outside the envelope of initial allotment national service area | Request for conversion with changes outside the envelope of initial allotment supra national service area | Request for additional use national service area | Request for additional use, with supra national service area and global coverage\*\* |
| 2012 Q1 + Q2 | 0 | 0 | 0 | 0 | 3 | 20 |
| 2012 Q3 + Q4 | 1 | 0 | 2 | 0 | 2 | 23 |
| 2013 Q1 + Q2 | 1 | 0 | 0 | 0 | 4 | 27 |
| 2013 Q3 + Q4 | 1 | 0 | 0 | 0 | 0 | 17 |
| 2014 Q1 + Q2 | 1 | 0 | 0 | 0 | 2 | 30 |
| 2014 Q3 + Q4 | 0 | 0 | 0 | 0 | 7 | 20 |
| 2015 Q1 + Q2 | 0 | 0 | 1 | 0 | 1 | 30 |
| 2015 Q3 + Q4 | 0 | 0 | 0 | 0 | 0 | 26 |
| 2016 Q1 + Q2 | 0 | 1 | 0 | 0 | 0 | 23 |
| 2016 Q3 + Q4 | 0 | 0 | 0 | 0 | 1 | 24 |
| 2017 Q1 + Q2 | 0 | 0 | 0 | 0 | 4 | 34 |
| 2017 Q3 + Q4 | 0 | 1 | 0 | 0 | 0 | 25 |
| 2018 Q1 + Q2 | 0 | 0 | 0 | 0 | 6 | 20 |
| 2018 Q3 + Q4 | 0 | 0 | 0 | 0 | 0 | 10 |
| 2019 Q1 + Q2 | 1 | 1 | 0 | 0 | 0 | 4 |
| \*\* Notices for additional use with service area and coverage beyond the national territory of notifying administration. |

**Statistics of RR Appendix 30B notices received by the Bureau (since 2009; period 2012 – 2019 at the Quarter basis\*))**

|  | Request for conversion without change of initial allotment national service area | Request for conversion with changes within the envelop of initial allotment national service area  | Request for conversion with changes outside the envelop of initial allotment national service area  | Request for conversion with changes outside the envelop of initial allotment supra national service area  | Request for additional use national service area  | Request for additional use, with supra national service area and global coverage\*\*)  |
| --- | --- | --- | --- | --- | --- | --- |
| 2009 | 0 | 0 | 0 | **1** (USA) | **3**(1 (IND);2 (RUS)) | **17**(1 (ARS/ARB);1 (CYP); 5 (G);1 (ISR);5 (LUX);1 (PNG); 1 (S);2 (TUR)) |
| 2010 | **1** (BLR) | 0 | 0 | 0 | **2**(1 (MEX);1 (VTN)) | **33**(2 (ARS/ARB);1 (BLR);2 (CYP); 8 (F);3 (ISR);1 (KAZ);1 (LUX);1 (MCO);2 (PNG);8 (RUS/IK);4 (UAE)) |
| 2011 | **2**(1 (MEX);1 (SDN)) | 0 | 0 | 0 | **4** (RUS) | **38**(1 (ARS/ARB);1 (BGD);1 (BLR);1 (CHN); 8 (F);6 (E); 1 (G);5 (ISR);4 (HOL);1 (MLA);1 (PNG);1 (QAT);6 (RUS/IK);1 (UAE)) |
| 1st Quarter(Jan. – March) 2012 | 0 | 0 | 0 | 0 | 0 | **11**(6 (CHN);2 (LUX); 3 (S)) |
| 2nd Quarter(Apr. – June) 2012 | 0 | 0 | 0 | 0 | **3**(2 (MEX);1 (RUS)) | **9**(2 (ARS/ARB);1 (CHN); 1 (F);1 (G); 2 (PNG);2 (RUS/IK)) |
| 3rd Quarter(July – Sept.) 2012 | **1** (BGD) | 0 | 0 | 0 | 0 | **5**(1 (B);1 (BGD); 1 (F);1 (IRN);1 (MCO)) |
| 4th Quarter(Oct. – Dec.) 2012 | 0 | 0 | **2** (B) | 0 | **2** (B) | **18**(1 (ALG);1 (ARM);2 (ARS/ARB);1 (B); 2 (CHN);2 (F);1 (HNG);3 (HOL);1 (ISR);1 (NOR);2 (PNG);1 (QAT)) |
| 1st Quarter(Jan. – March) 2013 | **1** (MNE) | 0 | 0 | 0 | 0 | **11**(1 (F); 2 (G);3 (HOL);1 (MLA);2 (QAT);1 (RUS/IK);1 (S)) |
| 2nd Quarter(Apr. – June) 2013 | 0 | 0 | 0 | 0 | **4** (IND) | **16**(1 (ARS/ARB);1 (BLR);1 (E); 8 (F);1 (G); 1 (LAO);1 (NCG);2 (PNG)) |
| 3rd Quarter(July – Sept.) 2013 | **1** (MNG) | 0 | 0 | 0 | 0 | **11**(2 (F); 2 (G);2 (HOL);1 (LAO);1 (PNG); 1 (S);1 (UAE);1 (VTN)) |
| 4th Quarter(Oct. – Dec.) 2013 | 0 | 0 | 0 | 0 | 0 | **6**(2 (HOL);1 (IRQ);1 (PNG);2 (UAE)) |
| 1st Quarter(Jan. – March) 2014 | 0 | 0 | 0 | 0 | 0 | **18**(1 (B);2 (CHN); 4 (F);3 (HOL); 2 (J);1 (MCO);5 (PNG)) |
| 2nd Quarter(Apr. – June) 2014 | **1** (BUL) | 0 | 0 | 0 | **2**(1 (CHN); 1 (RUS)) | **12**(1 (BUL); 2 (D);2 (E); 2 (F);2 (PNG);3 (RUS)) |
| 3rd Quarter(July – Sept.) 2014 | 0 | 0 | 0 | 0 | **7**(6 (CHN); 1 (IND)) | **7**(1 (ARS/ARB); 1 (D); 1 (E);1 (G); 1 (PNG); 2 (RUS)) |
| 4th Quarter(Oct. – Dec.) 2014 | 0 | 0 | 0 | 0 | 0 | **13**(1 (BLR);1 (CYP); 2 (E);2 (F); 3 (G);1 (HOL);1 (PNG); 1 (S);1 (USA)) |
| 1st Quarter(Jan. – March) 2015 | 0 | 0 | 0 | 0 | 0 | **18**(1 (F); 1 (G);11 (IND); 2 (J);1 (KAZ);1 (QAT);1 (RUS)) |
| 2nd Quarter(Apr. – June) 2015 | 0 | 0 | **1** (CAN) | 0 | **1** (MLA) | **12**(1 (CAN); 1 (E);1 (F); 1 (HNG); 1 (ISR);1 (MLA);4 (PNG);2 (RUS/IK)) |
| 3rd Quarter(July – Sept.) 2015 | 0 | 0 | 0 | 0 | 0 | **11**(1 (CYP); 1 (G); 2 (PNG);2 (QAT);5 (RUS/IK)) |
| 4th Quarter(Oct. – Dec.) 2015 | 0 | 0 | 0 | 0 | 0 | **15**(1 (E); 1 (F);1 (GRC);1 (HOL);1 (INS);2 (ISR);1 (PAK);6 (UAE);1 (USA)) |
| 1st Quarter(Jan. – March) 2016 | 0 | **1** (IRN) | 0 | 0 | 0 | **10**(1 (ETH); 1 (F);2 (IND);1 (IRN);1 (LUX);1 (QAT); 1 (S);1 (TUR);1 (USA)) |
| 2nd Quarter(Apr. – June) 2016 | 0 | 0 | 0 | 0 | 0 | **13**(1 (CHN); 1 (E);5 (F); 3 (HOL);1 (KAZ);1 (PNG);1 (RUS/IK)) |
| 3rd Quarter(July – Sept.) 2016 | 0 | 0 | 0 | 0 | 0 | **11**(2 (E); 2 (J);4 (UAE);2 (RUS/IK);1 (USA)) |
| 4th Quarter(Oct. – Dec.) 2016 | 0 | 0 | 0 | 0 | **1** (CHN) | **13**(2 (D); 4 (F);4 (HOL);1 (LUX);1 (QAT);1 (RUS)) |
| 1st Quarter(Jan. – March) 2017 | 0 | 0 | 0 | 0 | 0 | **17**(1 (D); 10 (F);3 (G); 3 (ISR)) |
| 2nd Quarter(Apr. – June) 2017 | 0 | 0 | 0 | 0 | **4**(1 (IND);3 (INS)) | **17**(1 (CAN);16 (F)) |
| 3rd Quarter(July – Sept.) 2017 | 0 | **1** (BOL) | 0 | 0 | 0 | **8**(1 (BGD);2 (F); 1 (NCG);2 (QAT);2 (RUS/IK)) |
| 4th Quarter(Oct. – Dec.) 2017 | 0 | 0 | 0 | 0 | 0 | **17**(2 (E); 8 (F);5 (HOL);1 (INS);1 (IRN)) |
| 1st Quarter(Jan. – March) 2018 | 0 | 0 | 0 | 0 | 0 | **7**(1 (CBG);2 (E); 2 (F);1 (ISR);1 (MCO)) |
| 2nd Quarter(Apr. – June) 2018 | 0 | 0 | 0 | 0 | **6**(5 (IND;1 (RUS)) | **13**(1 (E); 11 (F);1 (USA)) |
| 3rd Quarter(July – Sept.) 2018 | 0 | 0 | 0 | 0 | 0 | **6**(3 (E); 1 (HOL);1 (QAT);1 (UAE)) |
| 4th Quarter(Oct. – Dec.) 2018 | 0 | 0 | 0 | 0 | 0 | **4**(1 (E); 1 (HOL);1 (IND);1 (INS)) |
| 1st Quarter(Jan. – March) 2019 | **1**(ROU) | 0 | 0 | 0 | 0 | **2**(1 (E); 1 (F)) |
| 2nd Quarter(Apr. – June) 2019 | 0 | **1**(NPL) | 0 | 0 | 0 | **2**(1 (F); 1 (TUR)) |
| \* This Table needs to be completed till October 2019 with all necessary clarification.\*\* Notices for Additional use with service area and coverage beyond the national territory of notifying administration. |



Annex 2

Cases of Harmful interference to Space Services

# 1 Implementation of Resolution 186 (Rev. Dubai, 2018)

On 1 September 2018, the Radiocommunication Bureau released the operational version of the on-line application “Satellite Interference Reporting and Resolution System” (SIRRS) to facilitate the reporting and exchange of information between Administrations and the Bureau concerning cases of harmful interference affecting space services (see [CR/435](https://www.itu.int/md/R00-CR-CIR-0435/en) of 28 August 2018). The Bureau previously released a beta-version for testing by administrations (see [CR/428](https://www.itu.int/md/R00-CR-CIR-0428/en) of 13 March 2018).

224 individual users from 84 Administrations have so far been registered in SIRRS. Since the release of the operational version on 1 September 2018 until 30 June 2019, 38 cases of harmful interference were reported through SIRRS.

The Bureau hopes that the SIRRS application may allow administrations to report more easily cases of interference affecting space services under Article **15** of the Radio Regulations (see in particular No. **15.27**) and intends to continuously improve the SIRRS application, taking into account feedbacks from administrations and the latest developments in ITU-R Study Groups on Recommendations and Reports associated to space monitoring and interference reporting.

Administrations that have not been registered in the SIRRS system yet are requested to do so following the procedure indicated at the following website:

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

# 2 Cases of Harmful Interference affecting Space Services reported to the Bureau

Statistics on reports of harmful interference submitted to the Bureau from 2011 to 2018 are shown in the diagram below:

The total bandwidth of geostationary satellite networks affected by harmful interference seems to be increasing. However, percentage of spectrum for which no harmful interference was reported has been stable ( 99.94 % ± 0.02% in the last 4 years (2015-2018)) because the total geostationary capacity recorded in MIFR has also increased.

From 01.01.2015 until 30.06.2019 the Bureau received reports concerning 152 cases and provided assistance when so requested by the affected Administration(s).

Summaries of some notable cases of harmful interference are found below:

## 2.1 Fixed Satellite Service, Broadcasting Satellite Service and associated Space Operations Functions in the frequency bands 6/4 GHz and 14-17-18/10-12 GHz

Harmful interference was caused due to: lack of coordination, unauthorized use, unnecessary emissions as defined in No. **15.1** of the Radio Regulations (typically a high-power unmodulated carrier) and technical/operational failures.

## 2.2 Radio Navigation Satellite Service (RNSS) in the frequency bands 1 575.42 ± 15.345 MHz and 1 227.60 ± 11 MHz

Interfering carriers in the frequency bands 1 575.42 ± 15.345 MHz (L1 signal) as well as 1227.60 ± 11 MHz (L2 signal) with a nature of interference described in Article 15.1 of the Radio Regulations affected international communications either in the form of lost messages or total unavailability of the service. Affected receivers were on board of aircrafts and maritime vessels near airports and over international waters.

The following possible interference sources were identified:

### 2.2.1 Use of transmitting devices without the required authorization or license.

The Bureau draws special attention to No. **15.28** of the Radio Regulations requiring “absolute international protection” of transmissions used for safety and regularity of flights, and to Article 45 of the ITU Constitution “All stations, whatever their purpose, must be established and operated in such a manner as not to cause harmful interference…”

The Bureau wishes to inform Administrations of these cases while encouraging to take all possible measures at national level, including adequate legislation and enforcement mechanisms that prevent harmful interference cases originated by transmitting stations not in conformity with Article 18 of the Radio Regulations, which could operate in derogation of the abovementioned provisions of the ITU Constitution and Radio Regulations.

### 2.2.2 Military exercises or operations near zones of conflict:

While recognizing that “Member States retain their entire freedom with regard to military radio installations” (see § 202 in Article 48 of Constitution), these installations must, so far as possible, take measures to prevent harmful interference (see § 203 in Article 48 of Constitution).

Member States are invited, when assessing the interference risks associated with conflict zones or planning military exercises, to consider that the use of satellite-based systems can potentially be impacted beyond that zone, and further enhanced civil-military coordination is required.

## 2.3 Mobile-Satellite-Service in the frequency bands 1 626.5-1 660.5 MHz, 1 980-2 010 MHz and 2 670-2 690 MHz

**2.3.1** One GSO satellite network experienced harmful interference in several occasions in the frequency band 1626.5-1660.5 MHz associated to the uplink user terminal, as well as its space operations functions uplink in 6 GHz.

**2.3.2** Two GSO satellite networks have experienced harmful interference affecting their uplinks in the frequency band 2670-2690 MHz since 2016. Measurements and analysis provided by the affected administration conclude that interference is the result of the aggregation of LTE signals radiated from a large number of terrestrial LTE base stations. Annex 9 to [Document 4C/472](https://www.itu.int/md/R15-WP4C-C-0472/en) refer to this case of interference.

**2.3.3** One non-GSO satellite network in medium earth orbit has experienced harmful interference in its uplink in the 1980-2010 MHz band (this sharing situation is studied under WRC-19 agenda item 9.1, issue 9.1.1). Based on the results of static and dynamic theoretical analysis, which were confirmed by operational measurements, the affected Administration indicated that the origin of the harmful interference is the aggregation of transmissions from terrestrial IMT base stations to user equipment. [Document 5D/1265](https://www.itu.int/md/R15-WP5D-C-1265/en) refer to this case of interference.

## 2.4 Earth Exploration Satellite Service ( passive ) in 1400-1427 MHz band

Non-GSO satellite networks carrying passive sensors observing the 1400-1427 MHz band have been affected by harmful interference originating from:

1. Unwanted emissions from radars and other radio devices operating in adjacent bands and exceeding levels contained in Resolution **750 (Rev.WRC-15)**,

2. Unauthorized use of CCTV wireless devices making illegal use of the passive band in contradiction with No. 5.340 of the Radio Regulations,

3. Intermediate Frequency Radiation from BSS receivers due to poor shielding of cables and connectors (further information on this case may be found in Section 2.3.3 of the Chairman’s Report of ITU-R Working Party 7C, see [Document 7C/379](https://www.itu.int/dms_ties/itu-r/md/15/wp7c/c/R15-WP7C-C-0379%21%21MSW-E.docx)).

## 2.5 Radio Astronomy Service in the frequency band 1610.6-1613.8 MHz

Several Administrations reported experiencing harmful interference into their Radio Astronomy stations in the frequency band 1610.6-1613.8 MHz due to unwanted emissions originating from the downlink of a non-GSO satellite network in the mobile satellite service operating in the upper adjacent band.

The case was carefully considered by the Radio Regulations Board at its 74th, 75th, 76th and 77th meetings. The Board noted with satisfaction the continued dialogue and cooperation amongst the administrations involved on this matter. The Board also noted with concern the divergence in the conclusions of both parties on the interference situation caused by the new generation of the abovementioned non-GSO satellite network to radio astronomy stations and urged the administrations to continue these efforts and coordinate their interference measurements to provide viable and convergent results.

# 3 Extension of the International Monitoring System

During this 4-year period, ITU signed Cooperation Agreements for the use of Space Monitoring facilities with the Administrations of Belarus, China, Germany, Korea, Pakistan and Vietnam.

These Cooperation Agreements will allow measurements to be performed in relation to cases of harmful interference for which an administration is seeking the assistance of the Bureau under Article **15** or No. **13.2** of the Radio Regulations, as well as in cases of reported interference arising from coordination issues (Article 11, No. 11.41)

# 4 ITU Satellite Symposia

ITU organized meetings bringing together regulators, satellite operators, space agencies and the satellite industry in Geneva (Switzerland) in 2016, San Carlos de Bariloche (Argentina) in 2017, Geneva (Switzerland) in 2018 and San Carlos de Bariloche (Argentina) in 2019 to raise awareness of the current radio frequency interference situation, the importance of preventing harmful interference in accordance with the procedures of the Radio Regulations and to disseminate information on latest technologies in space monitoring, interference detection, geolocation and mitigation.

# 5 ITU-R Recommendations and Reports

ITU-R Working Party 7C developed Recommendation ITU-R RS 2106-0 – Detection and Resolution of radio frequency interference to Earth exploration-satellite service (passive) sensors, which scope is:

“Administrations operating EESS passive sensors which encounter instances of harmful radio frequency interference (RFI) should use the information in this Recommendation and its RFI reporting form in recording and reporting the RFI instance to the administration with jurisdiction over the transmitting stations which are causing the interference. The attached RFI reporting form should be provided in addition to the form in Appendix 10 of the Radio Regulations and is intended for use by administrations to report additional detailed information on interference to EESS passive sensors.”

In addition to the information in Chapter 5.1 on “Monitoring of spacecraft emissions” of the ITU-R Handbook on Spectrum Monitoring (Edition 2011) and Report ITU-R SM.2182-2 on “Measurement facilities available for the measurement of emissions from both GSO and non-GSO space stations” (approved in June 2019), ITU-R Working Party 1C developed Report ITU-R SM.2424-0 to provide “Measurement techniques and new technologies for satellite monitoring” (approved in June 2018). The purpose of this Report is “to provide a comprehensive description of the necessary functions of satellite monitoring stations, and related technical requirements for new monitoring solutions, as systematic and intuitive guidance for administrations that wish to establish satellite monitoring capabilities”.

In addition to the information in Report ITU-R SM.2181-0 on the “Use of Appendix 10 of the Radio Regulations to convey information related to emissions from both GSO and non-GSO space stations including geolocation information” (approved in 2010), ITU-R Working Party 1C is currently developing new guidelines on the procedure to follow in accordance with Article 15, and the parameters and supplementary information to Appendix 10 that can be submitted to the Bureau when dealing with cases of harmful interference affecting Space Services in different interference scenarios.

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1. The equivalent power flux-density is defined in No. **22.5C.1**. As for pfd values, epfd values are correlated to the interference power, Itot, measured at the output of the receiving antenna by the formula: Itot = epfd - 10log(4π/2) + Gr,max where Gr,max is the maximum gain (in dBi) of the antenna of the receive station. [↑](#footnote-ref-1)
2. This Column includes cases up to the end of July 2019. [↑](#footnote-ref-2)
3. The difference between the number of cases received and treated is due to the fact that sometimes notices received during one year were completed during subsequent year. [↑](#footnote-ref-3)
4. These included the ITU‑R Handbooks on National Spectrum Management; Computer Aided Techniques for Spectrum Management and Spectrum Monitoring. [↑](#footnote-ref-4)