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| **Radiocommunication Advisory Group Geneva, 15-17 April 2019** |  | |
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|  | | **Addendum 1 to Document RAG19/1-E** |
| **18 March 2019** |
| **Original: English** |
| Director, Radiocommunication Bureau | | |
| REPORT TO THE TWENTY-SIXTH MEETING OF THE RADIOCOMMUNICATION ADVISORY GROUP | | |
| STUDY GROUPS ACTIVITIES | | |

# 1 Working methods

Study Group activities were pursued within a stable Study Group (SG) and Working Party (WP) structure according to the work programmes defined in the ITU‑R Operational Plan. Working methods were satisfactorily applied in accordance with Resolution ITU‑R 1 and the associated Guidelines for the working methods.

# 2 Access to meeting documents

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

# 3 Electronic working facilities

Continuing emphasis has been placed on the use of electronic facilities that have brought considerable benefit to delegates as well as a significant economy in paper.

## 3.1 Sharepoint website

Access to documentation during meetings via a dedicated Sharepoint website is the standard practice. All Study Group and Working Party meetings are now completely paperless.

Sharepoint sites for Correspondence and Rapporteur Groups are also used extensively in the periods between the Working Party meetings.

## 3.2 File synchronization

A file synchronization facility has been implemented for all Study Group/Working Party meetings to facilitate access to the most recent versions of documents during meetings.

## 3.3 Online list of participants

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

## 3.4 Remote participation

Audio webcasts of all available languages have been provided during the plenary sessions of all Study Group and Working Party meetings held in Geneva.

In line with guidance provided by the RAG, the possibility of active remote participation using Adobe Connect facilities in English only has been offered during the Working Party meetings when no formal decision process is involved. Remote participants wishing to actively participate (e.g. to introduce a contribution) need to register for the meeting beforehand and coordinate their active participation with the responsible Counsellor.

Active remote participation was provided to allow participants in Working Parties to present contributions on only a few occasions since the last meeting of RAG. The general feedback received has been that such participation has been useful, but that it can be difficult to schedule and that it slows the meeting down.

While the Secretariat will make every effort to facilitate such active participation, it should be recognized that on some occasions this may not be possible due to factors such as the limited number of support staff, availability of equipped rooms, many parallel meetings and the need for the remote participants to have a high-quality Internet and phone connection.

However, remote participation has proven invaluable in the case of Correspondence and Rapporteur Group activities during intersessional periods. Such participation has enabled considerable progress in items relating to WRC-19 agenda items, where expected results are required at specified deadlines, and for meetings of smaller groups such as steering committees or the ITU CCT meetings.

## 3.5 Study Group webpages

The ITU is continuing the process of changing the presentation of its webpages to provide an updated and consistent look across the ITU website. All of the main SG and WP pages have been changed to the new format, and associated pages are being changed progressively when they need to be updated.

## 3.6 Captioning

Since December 2013, all Study Group meetings have been provided with live captioning in English. Feedback on this facility has been generally positive as an aid to following discussions, however the accuracy of the captioning, particularly with respect to frequency bands and radiocommunication acronyms, tends to be poor.

# 4 Participation

As reported at the last RAG meeting, there has been a progressive increase in the level of participation in ITU-R Study Group and Working Party meetings since 2003. This is very encouraging, but at the same time it does create some logistical difficulties.

Participation in the largest groups can now exceed 300 – too large to be accommodated in large rooms on the ITU premises (Popov, C). The average participation per meeting is now of the order of 120 participants (see Figure 1 below) – too large to be comfortably accommodated in the medium size rooms at ITU (A, C1, C2, Popov 1, Popov 2, H, K). Even the smallest groups now have an average participation exceeding 60 participants, which in turn is too large to be comfortably accommodated in the smaller rooms at ITU (H1, H2, K1, K2, L and M).

Figure 1 - General average participation to ITU-R Study Group/

Working Party meeting per year since 2003

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

# 5 Meeting rooms

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

* the increased number of meetings being arranged by all of the Sectors and the General Secretariat;
* the shortage of meeting rooms with a capacity of more than 120 participants;
* the need to avoid overlap and clashes of meeting dates;
* the limited availability and very long lead times required for bookings in alternative facilities such as CICG.

Consequently, in the coming years an increasing number of meetings will need to be held at other locations outside ITU. To that end, offers from the membership to host Study Group/Working Party meetings during this period will be particularly welcome. In the longer term, the requirements for meeting rooms at ITU will need to be carefully taken into account in the design of the Varembé 2 building.

# 6 Notable activities in the Study Groups

Since the last meeting of the RAG, Study Group activities largely focused on progressing the work on the RA-19 and CPM19-2 preparations and on the development of new or revised Recommendations/Reports associated with the WRC-19 agenda items and issues. Some of the notable activities and other ongoing standardization studies in each Study Group are highlighted below. Table 1 summarizes the ITU-R Study Groups outputs in terms of Recommendations and Reports approved at or following their meetings in 2018.

| **Subject** | **New or revised ITU-R Recommendations approved** | **New or revised Reports approved** |
| --- | --- | --- |
| **International Mobile Telecommunications (IMT)** vision, frequency arrangements, radio interface, spectrum sharing and global circulation of terminals, enabling global mobile broadband development | M.1457-14 | M.2373-1, M.2440-0, M.2441-0 |
| **Maritime and aeronautical systems** operational characteristics, identities and protection, including wireless avionics and global flight tracking | M.493-15, M.2010-1, M.2121-0, M.2122‑0 | M.2436-0, M.2443-0 |
| **Land mobile communications, including** cognitive radio systems, broadband wireless, railway communication and **Intelligent Transport Systems** (ITS) radio interface standards | M.1890-1, M.2120-0 | M.2442-0, M.2444-0, M.2445-0 |
| **Television and sound** signals coding, production, exchange and broadcasting for HDTV, UHDTV and 3D, and sharing of broadcasting with other services, laying the foundation of the development of advanced television and sound technologies | **Sound:** BS.[1196-](http://www.itu.int/rec/R-REC-BS.1196/en)7, [BS.1284-](http://www.itu.int/rec/R-REC-BS.1284/en)2, [BS.1548‑](http://www.itu.int/rec/R-REC-BS.1548/en)6, [BS.2051-](http://www.itu.int/rec/R-REC-BS.2051/en)2 and BS.2125-0  **Television:** BT.814-4,[BT.1122-](http://www.itu.int/rec/R-REC-BT.1122/en)3, [BT.1366‑](http://www.itu.int/rec/R-REC-BT.1366/en)3, [BT.1702](http://www.itu.int/rec/R-REC-BT.1702/en)-1, [BT.1872-](http://www.itu.int/rec/R-REC-BT.1872/en)2, [BT.2054](http://www.itu.int/rec/R-REC-BT.2054/en)‑1, BT.2055‑1, [BT.2075](http://www.itu.int/rec/R-REC-BT.2075/en)-2, [BT.2100‑](http://www.itu.int/rec/R-REC-BT.2100/en)2, BT.2123‑0 and BT.2124-0 | **Sound:** [BS.2388-3](http://www.itu.int/pub/R-REP-BS.2388), [BS.2419-0](https://www.itu.int/pub/R-REP-BS.2419), BS.2433-0 and BS.2434-0,  **Television:** [BT.2140-1](http://www.itu.int/pub/R-REP-BT.2140)1, [BT.2207](http://www.itu.int/pub/R-REP-BT.2207)-4, [BT.2245](http://www.itu.int/publ/R-REP-BT.2245)‑4&5, [BT.2267](http://www.itu.int/pub/R-REP-BT.2267)-8, [BT.2342‑](http://www.itu.int/pub/R-REP-BT.2342)1&2, [BT.2343-](http://www.itu.int/pub/R-REP-BT.2343-2-2016)3, [BT.2344-](http://www.itu.int/pub/R-REP-BT.2344)2, [BT.2380‑](http://www.itu.int/pub/R-REP-BT.2380)2, [BT.2390-](http://www.itu.int/pub/R-REP-BT.2390)4&5, [BT.2400-](http://www.itu.int/pub/R-REP-BT.2400)1&2, [BT.2408-1](http://www.itu.int/pub/R-REP-BT.2408), [BT.2420-0](https://www.itu.int/pub/R-REP-BT.2420) and BT.2432-0 |
| **Fixed communications** technical and operational characteristics, channelling arrangements and spectrum sharing for radio-relays and fixed wireless access | F.1245-3, F.1336-5, F.2119-0 | M.2435-0, F.2437-0, F.2438-0, F.2439-0 |
| **Radars** technical and operational characteristics, protection, including aeronautical, meteorological and automotive radars | M.1462-1 |  |
| **Search and rescue**, Public Protection and Disaster Relief (**PPDR**) radio interface standards, frequency arrangements and provision of services, enabling global harmonization | F.1105-4, M.1637-1, M.2009-2 |  |
| **Earth exploration-satellite, Meteorological-satellite, Space Research and Radioastronomy services** characteristics, protection/sharing, including manned research, data relay, nano satellites, enabling prediction of weather, monitoring of Earth’s resources and understanding of climate change | M.1849-2  RS.1165-3, RS.1263-3 (12/2018)  RS.1859-1, RS.1883-1, RS.2042-1, SA.364-6,  SA.1163-3, SA.1164-3, TF.2118-0 | RA.2189-1, RA.2428-0, RS.2431-0, SA.2425-0,  SA.2426-0, SA.2427-0, SA.2429-0, SA.2430-0 |
| **Spectrum Management,** including methods for identification and elimination of interference, data dictionary, spectrum redeployment, spectrum use measurement, unlicensed and shared uses of spectrum, dynamic spectrum access, smart grids and wireless power transmission | SM.[1051-4](https://www.itu.int/rec/R-REC-SM.1051), SM.[1896-1](https://www.itu.int/rec/R-REC-SM.1896), SM.[2117-0](https://www.itu.int/rec/R-REC-SM.2117) | SM.[2012-6](https://www.itu.int/pub/R-REP-SM.2012), SM.[2093-3](https://www.itu.int/pub/R-REP-SM.2093), SM.[2211-2](https://www.itu.int/pub/R-REP-SM.2211),  SM.[2356-2](https://www.itu.int/pub/R-REP-SM.2356), SM.[2421-0](https://www.itu.int/pub/R-REP-SM.2421), SM.[2422-0](https://www.itu.int/pub/R-REP-SM.2422),  SM.[2423-0](https://www.itu.int/pub/R-REP-SM.2423), SM.[2424-0](https://www.itu.int/pub/R-REP-SM.2424) |

## 6.1 Study Group 1

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

SG 1 and Working Parties 1A, 1B and 1C met in June 2018 and an additional meeting of Working Party 1B was held in November 2018 to progress the work on the preparatory studies for WRC-19 agenda item 9.1 issue 9.1.6, as well as on other topics, under the responsibility of this Working Party, such as the studies on short-range devices (SRDs).

The June 2018 meetings developed two revised and one new Recommendations, subsequently adopted and approved, which provide i) new regionally harmonized frequency ranges for the ultra-wideband (UWB) application for communication, location tracking and radio determination; ii)  to provide additional elements to comply with the provisions contained in Resolution **205 (Rev.WRC-15)** regarding the monitoring of the frequency band 405.9 to 406.2 MHz; iii) to define a harmonised file structure and format for the exchange of In-phase and Quadrature components (I/Q) data files containing a digitized recording of an RF signal.

The meetings approved four new ITU-R Reports describing i) unwanted emissions of digital radio systems; ii) visible light systems for broadband communications; iii) technical and operational aspects of Low Power Wide Area Networks (LPWAN) for Machine-Type Communication and the Internet of Things in frequency ranges harmonised for SRD operation; and iv) measurement techniques and new technologies for satellite monitoring. The June 2018 meetings developed and approved also four revised Reports.

A number of editorial updates were also made to several Recommendations and Reports in accordance with Resolution ITU-R 1-7.

At the previous RAG meeting in 2018, it was reported that during its 2017 meeting ITU-R SG 1 developed and approved a reply liaison statement to ITU-T SG 3 regarding the development of draft ITU-T Recommendations on shared use of spectrum and telecommunication infrastructure and on various methodologies for valuation of spectrum in response to ITU-T Question 3/3 – “Study of economic and policy factors relevant to the efficient provision of international telecommunication services”. ITU-R SG 1 indicated that the shared use of spectrum, including spectrum management aspect of infrastructure sharing, as well as economic aspects of spectrum management, including spectrum valuation and spectrum pricing are within the terms of reference of ITU-R WP 1B. ITU-R SG 1 invited ITU-T SG 3 to participate in the ITU-R SG 1 activities and provided the relevant ITU‑R deliverables in order to avoid as much as possible overlapping activity between the ITU Sectors. In May 2018, ITU-T SG 3 sent a new liaison statement to ITU-R SG 1 indicating that it had decided to continue the work on the draft Recommendation on shared use of spectrum and telecommunication infrastructure with the reference on the new Report ITU-R SM.2404 “Regulatory tools to support enhanced shared use of the spectrum”. ITU-T SG 3 indicated also that it will continue to work closely with ITU-R SG 1 to avoid duplication of work and will continue to collaborate on economic and policy issues.

In addition to other activities in preparation for the next SG 1 block of meetings in June 2019, including studies assigned to WP 1A and WP 1B on some WRC-19 agenda items and issues, correspondence studies continued on topics such as:

– the coexistence of wired telecommunication with radiocommunication systems;

– spectrum monitoring evolution;

– essential requirements for a spectrum monitoring system for developing countries;

– other technical studies related to spectrum monitoring (methods for estimating population coverage for public terrestrial broadcasting networks, use of unmanned aerial vehicles for spectrum monitoring and measurements; field strength measurement accuracy; practical estimation of electromagnetic and interference environment in GNSS frequency bands; EMF measurements to assess human exposure; test procedure for measuring geolocation accuracy based on TDOA; performance evaluation of mobile DF units in operational environment).

## 6.2 Study Group 3

In furthering its work on propagation measurement, data analysis, modelling and prediction in various parts of the spectrum up to 375 THz, thereby laying the foundation for the design of radiocommunication systems and the assessment of interference, Study Group 3 continues to revise or develop new recommendations, reports and handbooks under its purview. During 2018 no meeting of Study Group 3 has been convened as per its usual schedule. Working Parties 3J, 3K, 3L and 3M continued work on revisions of existing recommendations and reports, and draft new recommendations and reports in preparation for the next meeting of Study Group 3 in May 2019. A key priority is liaison with other ITU-R Study Groups to provide advice on the application of Study Group 3 prediction methods to emerging requirements. Another major activity is the provision of software tools to implement Study Group 3 prediction methods; this was the result of significant work within a number of administrations to develop and test software. Recommendations in the P‑series remain the most popular series and statistics for January to September 2018 indicate that they received the highest number of downloads (more than 266 000).

## 6.3 Study Group 4

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

Study Group 4 Working Parties finalized the preparatory work for WRC-19 under the agenda items for which they are the leading groups and produced related draft CPM texts for all those agenda items.

Draft revised Recommendations pertaining to the scope of SG 4 were agreed and sent for consideration by Study Group 4, in particular draft revision of Recommendations ITU-R M.1901-1 “Guidance on ITU-R Recommendations related to systems and networks in the radionavigation-satellite service operating in the frequency bands 1 164-1 215 MHz, 1 215-1 300 MHz, 1 559-1 610 MHz, 5 000-5 010 MHz and 5 010-5 030 MHz” ITU-R M.1902-0 “Characteristics and protection criteria for receiving earth stations in the radionavigation-satellite service (space-to-Earth) operating in the band 1 215-1 300 MHz”, ITU-R M.1903-0 “Characteristics and protection criteria for receiving earth stations in the radionavigation-satellite service (space-to-Earth) and receivers in the aeronautical radionavigation service operating in the band 1 559-1 610 MHz”, ITU-R M.1904-0 “Characteristics, performance requirements and protection criteria for receiving stations of the radionavigation-satellite service (space-to-space) operating in the frequency bands 1 164-1 215 MHz, 1 215-1 300 MHz and 1 559-1 610 MHz”, and ITU-R M.1905-0 “Characteristics and protection criteria for receiving earth stations in the radionavigation-satellite service (space-to-Earth) operating in the band 1 164-1 215 MHz”.

Draft new and revised reports pertaining to the scope of SG 4 were agreed and sent for approval by Study Group 4, in particular draft revision of Report ITU-R BO.2071-1 “BSS system parameters between 17.3 GHz and 42.5 GHz and associated feeder links” and draft new Report on “RNSS applications in the 1 164-1 215 MHz, 1 215-1 300 MHz, and 1 559-1 610 MHz frequency bands”.

## 6.4 Study Group 5

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

Fifteen Recommendations and twelve Reports pertaining to the scope of SG 5 were approved, some of which are in support of the studies carried out in relation to WRC‑19 agenda items. Other than the normal revision of existing documents the WPs have worked on several studies producing relevant Reports/Recommendations.

Working Party 5A produced the following new documents:

* Recommendation ITU-R M.2120 “Harmonization of frequency bands for Intelligent Transport Systems in the mobile service”. This Recommendation provides guidance on harmonized frequency bands to be used by intelligent transport systems (ITS) and encourages administrations to use harmonized frequency bands for ITS applications.
* Report ITU-R M. 2442 “Current and future usage of railway radiocommunication systems between train and trackside (RSTT)”. This Report addresses the technical and operational characteristics and the spectrum usage of current and planned RSTT as well as the studies on spectrum needs of RSTT, based on the responses to the questionnaire and contributions.
* Report ITU-R M. 2444 “Examples of arrangements for Intelligent Transport Systems deployments under the mobile service”. This Report provides examples of arrangements for intelligent transport systems (ITS) deployments in certain regions and countries to assist Administrations in their planning for deployment of ITS within their jurisdictions.
* Report ITU-R M. 2445 “Intelligent Transport Systems (ITS) usage”. This Report addresses the usages of Intelligent Transport System (ITS) radiocommunication applications, such as vehicle-to-infrastructure, vehicle-to-vehicle, vehicle-to-pedestrian communications for traffic safety related and traffic efficiency applications as well as electronic tolling systems and automotive radars for collision avoidance.

Working Party 5B produced the following new documents:

* Recommendation ITU-R M.2121 “Technical and operational characteristics for aeronautical mobile service systems limited to aircraft transmissions of aeronautical mobile telemetry for flight testing in the band 5 150-5 250 MHz in Region 1 and in Brazil in accordance with RR No. 5.446C”. This Recommendation provides technical and operational characteristics for aeronautical mobile telemetry (AMT) operated in some countries of Region 1 and in Brazil in the frequency range 5 150 – 5 250 MHz in accordance with RR No. 5.446C which recognizes an allocation to the aeronautical mobile service on a primary basis, limited to aeronautical telemetry transmissions from aircraft stations.
* Recommendation ITU-R M.2122 “Technical characteristics and protection criteria for aeronautical mobile systems operating in the mobile service in the frequency range 21.2-22 GHz”. This Recommendation provides information on the technical characteristics and protection criteria for systems operating in the aeronautical mobile service (AMS), planned to or currently operating in the frequency range 21.2 22 GHz for use in sharing and compatibility studies as needed.
* Report ITU-R M.2435 “Technical studies on the satellite component of the VHF data exchange system”. This report provides a summary of why a VDES satellite component is required, identifies the spectrum requirements and provides a technical description of the satellite component of VDES and the results of the appropriate sharing and compatibility studies.
* Report ITU-R M.2436 “The global aeronautical distress and safety system”. This report provides consideration on the concept of operations on global aeronautical distress and safety system as defined in version 6.0 and approved by Air Navigation Commission of International Civil Aviation Organization.
* Report ITU-R M.2443 “NAVDAT Guidelines”. This Report describes the use of the NAVDAT system operating in the mobile maritime service to provide digital broadcasting of safety and security related information from shore to ships. This Report gives information on the implementation of the radio parts of the NAVDAT system and on its overall understanding.

Working Party 5C produced the following new documents:

* Recommendation ITU-R F.2119 “Guidance on technical parameters and methodologies for sharing and compatibility studies related to fixed and land mobile services in the frequency range 1.5-30 MHz”. This Recommendation gives guidance to perform sharing studies related to systems in the fixed and land mobile services in the frequency range 1.5-30 MHz. It establishes a list of parameters, that characterize a system to assist in sharing studies, provides information on the methodologies that can be used for sharing analyses involving fixed and land mobile services in this frequency range.
* Report ITU-R F.2437 “Sharing and compatibility studies of HAPS systems in the fixed service for the frequency band 6 440-6 520 MHz”. This Report provides sharing and compatibility studies between High Altitude Platform Station (HAPS) and systems in the Fixed, Fixed Satellite, Mobile, Earth Exploration Satellite Services and Radio Astronomy operating in the 6 440-6 520 MHz frequency range.
* Report ITU-R F.2438 “Spectrum needs of high altitude platform stations (HAPS) broadband links operating in the fixed service”. The 2015 World Radiocommunication Conference (WRC) adopted agenda item 1.14 for WRC 19 along with Resolution 160 (WRC-15) on facilitating access to broadband applications delivered by high altitude platform station (HAPS). This contribution addresses resolves 1 of WRC-19 agenda item 1.14, which invites the ITU-R to study additional spectrum needs for gateway and fixed terminal links required for HAPS to provide broadband connectivity in the fixed service.
* Report ITU-R F.2439 “Deployment and technical characteristics of broadband high altitude platform stations in the fixed service in the frequency bands 6 440-6 520 MHz, 21.4 22.0 GHz, 24.25-27.5 GHz, 27.9-28.2 GHz, 31.0-31.3 GHz, 38.0 39.5 GHz, 47.2-47.5 GHz and 47.9-48.2 GHz used in sharing and compatibility studies”. This report provides deployment and technical characteristics for the fixed service using high altitude platform stations (HAPS) in the frequency bands: 6 440-6 520 MHz, 21.4 22.0 GHz, 24.25 27.5 GHz, 27.9-28.2 GHz, 31.0-31.3 GHz, 38.0 39.5 GHz, 47.2-47.5 GHz and 47.9 48.2 GHz, in accordance with Resolution 160 (WRC-15). It provides information on broadband HAPS links used in sharing and compatibility studies in the frequency bands listed above, and in adjacent bands.

Working Party 5D produced the following new documents:

* Report ITU-R M.2440 “The use of the terrestrial component of International Mobile Telecommunications (IMT) for Narrowband and Broadband Machine-Type Communications”. This Report addresses the technical and operational aspects of terrestrial IMT-based radio networks and systems supporting MTC applications, as well as spectrum needed, including possible harmonized use of spectrum to support the implementation of narrowband and broadband MTC infrastructure and devices.
* Report ITU-R M.2441 “Emerging usage of the terrestrial component of International Mobile Telecommunication (IMT)”. This Report is a compilation document on existing and new usage of IMT in specific applications. Further, it introduces potential new emerging applications of IMT in areas beyond traditional voice, data and entertainment type communications. It is provided as a reference document on these important uses of IMT, as envisaged in the vision for IMT-2020.

Adhering to its published schedule related to IMT-2020 terrestrial radio interface technology development, ITU-R Working Party 5D has in 2017 completed on schedule the above mentioned three draft new reports that make up the three critical pillars underpinning the IMT-2020 process for technologies to attain the global IMT-2020 designation by ITU in early 2020. These three critical documents have been advance shared with the relevant external organization industry partners in anticipation of final approval in ITU-R by Study Group 5 in November and are a key cog in the global 5G work program.

Task Group (TG) 5/1 completed its work on the preparatory studies for WRC-19 agenda item 1.13. The group approved the text for the draft CPM Report on solutions and regulatory options to satisfy this agenda item. This work was based on technical studies performed in TG 5/1 as contained in annexes to the TG 5/1 Chairman’s Report (see Doc. 5-1/[478](https://www.itu.int/md/R15-TG5.1-C-0478/en)).

## 6.5 Study Group 6

Study Group 6 is continuing studies on radiocommunication broadcasting, particularly on emerging topics including advanced technologies for terrestrial digital broadcasting, a global platform for the broadcasting service, high dynamic range television (HDR-TV), integrated broadcast-broadband (IBB) systems, new audio and video codecs for digital broadcasting, Advanced Immersive Audio-Visual (AIAV) systems, renderer specifications for advanced sound systems, application of Artificial Intelligence for broadcasting, audio–visual accessibility (AVA), and preparation for WRC-19 agenda items or issues related to broadcasting services.

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

Following the SG 6 block meetings in April and October 2018, in addition to 13 revised Recommendations, one suppressed Recommendation, two revised Questions and 17 revised Reports, one new Question, three new Recommendations and 5 new Reports were approved, namely:

**Question ITU-R**:

* 144/6 Use of Artificial Intelligence (AI) for broadcasting

**Recommendation ITU-R:**

* BT.2123-0 Video parameter values for advanced immersive audio-visual (AIAV) systems for production and international programme exchange in broadcasting
* BT.2124-0 Objective metric for the assessment of the potential visibility of colour differences in television
* BS.2125-0 A serial representation of the Audio Definition Model

**Report ITU-R:**

* [BS.2419-0](https://www.itu.int/pub/R-REP-BS.2419) Effect of microphone directivity regarding level calibration and equalization of advanced sound systems
* BS.2433-0 Assessment of modulation depth for AM sound broadcasting transmissions
* BS.2434-0 Loudness in Internet delivery of broadcast originated soundtracks
* BT.2420-0 Collection of usage scenarios and current statuses of advanced immersive audio-visual (AIAV) systems
* BT.2432-0 Technical criteria used for DTT planning in Central American and Caribbean Region.

On 18 October 2018, collocated with SG6 block meetings, ITU and EBU (European Broadcasting Union) held a joint workshop to raise the awareness of ITU member states and sector members to the risk of interference into the reception of Digital Audio Broadcasting system (DAB) in Band II from non-radiocommunication devices such as LED lighting systems and other apparatus using switched-mode power supplies.

## 6.6 Study Group 7

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

The systems linked with Study Group 7 are used in activities that are a critical part of our everyday life such as:

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

• weather forecasting and climate change monitoring and prediction;

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

• providing alerting/warning information;

• damage assessment and planning relief operations.

Study Group 7 approved 9 new and revised Recommendations and 8 new and revised Reports.

## 6.7 Coordination Committee for Vocabulary

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

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

## 6.8 CPM

The second session of CPM-19 was held successfully on 18-28 February 2019 with a record of participation and of documents and pages considered. While all the CPM texts were approved during the meeting, the compiled version of the CPM Report to WRC-19 has been made available on the CPM Webpage ([www.itu.int/go/ITU-R/CPM](http://www.itu.int/go/ITU-R/CPM)) provisionally in English on 8 March 2019 and, at the time of the preparation of this document, the final version in all the official languages of the Union were to be made available as soon as possible prior to the 6 month deadline before WRC-19, according to Resolution ITU-R 2-7.

During the closing CPM19-2 plenary session, it was requested to include in the Summary of discussions that it may be useful to revise Resolution ITU-R 2-7 in order to address the several points regarding the CPM, including the methods to satisfy agenda items and inclusion or otherwise of options, alternatives, views associated with these methods (see Section 4 of Doc. [CPM19-2/248](https://www.itu.int/md/R15-CPM19.02-C-0248/en)).

In addition, the Director of Radiocommunication Bureau was invited to kindly, if possible, indicate any improvement to Resolution ITU-R 2-7 to facilitate the task of RA-19 when considering the possible revision of that Resolution.

Apart from several points included in Doc. [CPM19-2/248](https://www.itu.int/md/R15-CPM19.02-C-0248/en), clarifications were sought during CPM19-2 on the application of the last sentence of *resolves* 1 of Resolution ITU-R 2-7, and in the response provided by the ITU Legal Advisor, it was indicated that a revision of this text should be envisaged, as appropriate.

In view of the above, the RAG is invited to consider an appropriate course of action to initiate prior to RA-19 a review and the preparation of a possible draft revision of Resolution ITU-R 2-7.

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

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

*Concerning ITU‑D*: BR continues to contribute to the BDT workshops and seminars. These events provide an opportunity to present ITU‑R’s standardization activities and, in turn, to demonstrate their contribution to PP Resolution 123 in bridging the standardization gap.

In response to WTDC Resolution 59 (Rev. Buenos Aires, 2017) on strengthening coordination and cooperation among the three ITU Sectors on matters of mutual interest, BR actively participated in the meetings of the ITU-D Study Groups to provide the latest development in the activities of the ITU-R study groups (including ITU-R Recommendations, Reports and Handbooks of particular interest to developing countries). The ITU-D Study Groups were invited to consider the ITU-R information provided so as to avoid duplication of effort, and make use of the results of work done by the ITU-R Study Groups. *Concerning 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 audiovisual media accessibility.

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

*Concerning other organizations*:Healthy liaison has continued between ITU‑R Study Groups and other organizations, with due reference to Resolution ITU‑R 9, where required. ITU‑R and BR representatives have continued their involvement in the Global Standards Collaboration (GSC), the World Standards Cooperation (WSC), CISPR and IEC. Liaison has also been evident with UN bodies and agencies in various fields, e.g. space weather, climate change and climate monitoring (WMO, UNFCCC, Global Humanitarian Forum, GEO, SFCG, NASA, ESA), civil aviation (ICAO) and EMF exposure (WHO).

# 8 Other intersectoral activities

BR has actively participated in other intersectoral activities, which are relevant to the work of ITU‑R Study Groups, as described below.

* *Climate Change and Emergency Communications*: Intersectoral activities continue to be coordinated by the ITU Climate Change and Emergency Telecommunications Task Force related to the implementation of Resolution 136 (Rev.Dubai, 2018), in which BR has active participation. There are also studies in response to Resolution ITU‑R 60-1 (Reduction of energy consumption for environmental protection and mitigating climate change by use of ICT/radiocommunication technologies and systems. The ITU‑R webpage on climate change has been updated to reflect the latest developments in this field.
* *Accessibility*: ITU-R has been actively participating in the ITU-T JCA-AHF (Joint Coordination Activity on Accessibility and Human Factors).
* *Spectrum/EMC*: When addressing spectrum related/EMC issues close coordination with the relevant ITU-R groups should be ensured before liaising with external organizations on those issues, particularly where well-established and efficient collaboration between ITU-R and those organizations already exists.
* *Preparation for and participation at ITU meetings*: BR is continuing its participation in the activities related to the major ITU events, conferences and meetings and their preparation in relation to the work of the ITU-R Study Groups. This includes the Plenipotentiary Conference, the ITU Council, WTSA, WTDC, WSIS, ITU TELECOM World and GSR (See also Section 9.4 of the main body of this Report).

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