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| **Radiocommunication Assembly (RA-15)Geneva, 26-30 October 2015** |  |
| **INTERNATIONAL TELECOMMUNICATION UNION** |  |
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|  | **Document 6/1001-E** |
| **30 September 2015** |
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| Chairman, Radiocommunication Study Group 6 |
| Chairman’s report |
| broadcasting service |
|  |

# 1 Introduction

The Radiocommunication Assembly (RA-12) held in Geneva, from 16-20 January 2012, confirmed that ITU-R Study Group 6 should continue its work on broadcasting services and re-appointed Mr C. Dosch (Germany) as Chairman of the Study Group, along with the following Vice-Chairmen: Mr. M. Ayoub (Lebanon), Mr A.O. Bolarinwa (Nigeria), Mr. R. Bunch (Australia), Prof. O. Gofaizen (Ukraine), Ms. C. Holiday (United States of America), Mr. A. Kesse (Côte d'Ivoire (Rep. of), Ms K.-M. Kim (Korea (Rep. of)), and Mr. A. H. Nafez (Iran (Islamic Rep. of)), Mr. Y. Nishida (Japan), Mr. M. Saad Almarzouqi (United Arab Emirates), Mr. P. Zaccarian (Italy), and Mr Q. Zeng (China). It should be mentioned that there was very close collaboration and good work done by the Vice-Chairmen and the Chairmen and Vice-Chairmen of the Working Parties.

This Report presents the results of the work carried out by Study Group 6 since January 2012 up to its last meeting held on 24 July 2015. In the preparation of this Report, the Chairman acknowledges the assistance of the SG 6 Steering Committee that included the Vice-Chairmen of Study Group 6 as well as the Chairmen and Vice-Chairmen of the Working Parties. The Steering Group assisted in defining the tasks of the three working parties and met during all block meetings of SG 6 to ensure the efficient and coordinated management of activities within Study Group 6.

# 2 Scope of work and structure of Study Group 6

The scope of the Study Group was modified by the 2007 Radiocommunication Assembly and reads as follows:

*“Radiocommunication broadcasting, including vision, sound, multimedia and data services principally intended for delivery to the general public.*

*Broadcasting makes use of point-to-everywhere information delivery to widely available consumer receivers. When return channel capacity is required (e.g. for access control, interactivity, etc.), broadcasting typically uses an asymmetrical distribution infrastructure that allows high capacity information delivery to the public with lower capacity return link to the service provider. This includes production and distribution of programmes (vision, sound, multimedia, data, etc.) as well as contribution circuits among studios, information gathering circuits (ENG, SNG, etc.), primary distribution to delivery nodes, and secondary distribution to consumers.*

The Study Group, recognizing that radiocommunication broadcasting extends from the production of programmes to their delivery to the general public, as detailed above, studies those aspects related to production and radiocommunication, including the international exchange of programmes as well as the overall quality of service.”

Within the above scope, the work of Study Group 6 has been carried out by three Working Parties: 6A, 6B and 6C. Via WP 6A, the Study Group also participated actively in Joint Task Group 4-5-6-7 (chaired first by Mr. Th. Ewers and then by Mr. M. Fenton), which was formed and tasked by CPM15-1 to carry out studies and prepare the text of the draft CPM text under WRC 15 Agenda items 1.1 and 1.2. Via WP 6B and WP 6C, the participation of SG 6 in the work of the Intersector Rapporteur Groups IRG-AVA, IRG-AVQA and IRG-IBB was carried out. The Chairman of SG 6 was influential in establishing the Terms of Reference for these IRGs which were created following the approval of the IRG procedure by WTSA and the provisional agreement of RAG (pending the final establishment of this instrument by RA-15).

The structure of Study Group 6 for the 2012 - 2015 study period is given in the **Attachment 1**.

# 3 The tasks for the meetings of Study Group 6

Since RA-12, the Study Group held eight meetings: 1 May 2012, 30-31 October 2012, 26 April 2013, 22 November 2013, 4 April 2014, 21 November 2014, 23 February 2015 and 24 July 2015. Each meeting was preceded by the block of meetings of WP 6A, 6B and 6C.

The major tasks for the meetings of Study Group 6 consisted of the following:

a) review, update (if necessary), suppress and consolidate all Questions assigned to the Study Group. The Study Group started the study period with 64 Questions. Four additional new Questions were approved, and two proposed new Questions and proposed suppressions of 27 Questions are currently under approval (CACE/746). If approved, a total of 43 Questions will remain;

b) review and adopt new and revised ITU-R Recommendations, Reports and Handbooks submitted by Working Parties and Task Groups. Study Group 6 currently has under its purview 247 Recommendations, 133 Reports and eight Handbooks. It is to be noted that Administrative Circular CACE/747 proposes adoption of 2 draft new ITU-R Recommendations and 15 draft revised ITU-R Recommendations;

c) review the progress of work in the Study Group, making revisions, as needed, to schedule, content and priority;

d) providing inputs to the groups responsible for preparing draft CPM text for WRC-15 agenda items;

e) prepare documents for the Radiocommunication Assembly 2015;

f) prepare contributions to the RAG meetings;

g) prepare contributions to the CCV meetings.

Some of the most important results of the meetings of the Working Parties from 2012 to 2015 are summarized below. The work was substantially carried out by correspondence through Rapporteur Groups using modern electronic means such as e-mail reflectors, FTP areas and WorkSpace (SharePoint) sites established by the BR Secretariat.

# 4 Summary of the results

a) Developed 28 new or 40 revisions to the existing Recommendations that were submitted for adoption/approval under Resolution ITU-R 1-6, PSAA Procedure. The results appear in Administrative Circulars CACE/581, 603, 624, 663, 679, 714 and 734. Two new and 15 revised Recommendations are currently under approval (CACE/747).

b) Adopted four new or 11 revisions to the existing Questions that were submitted for approval under Resolution ITU-R 1-6. The results appear in Administrative Circulars CACE/589, 609, 635, 672, 689. 729, 735 and 736. Two proposed new Questions and proposed suppressions of 27 Questions are currently under approval (CACE/746).

c) Approved 30 new Reports and made 59 revisions to the existing Reports (see **Attachment 2**).

d) Updated Handbook on digital terrestrial television (DTTB) and multimedia implementation and continue the work on Handbook on Colorimetry.

e) Working Parties 6A carried out studies and provided inputs to the responsible groups for the draft CPM Report developed by CPM15-2 (via JTG 4-5-6-7 on WRC‑15 agenda items 1.1 (Resolution 233 (WRC 12)) and 1.2 (Resolution 232 (WRC-12)).

f) Contribution to RAG on the Establishment of Intersector Rapporteur Groups, see Doc. RAG15-1/22: Proposed revision of Resolution ITU-R 6-1 to include procedures for setting up Intersector Rapporteur Groups.

# 5 Notable achievements

**WP 6A** (Terrestrial broadcasting delivery) contributed considerably to the Report of CPM15-2 to the WRC-15 in its capacity as “concerned group” for Agenda items AI 1.1. and AI 1.2 of WRC-15 and as “interested group” for , Agenda item AI 1.3. The substantial contribution were made by WP 6A to the JTG 4-5-6-7 with respect to AI 1.1 and AI 1.2 whilst meeting the established deadlines, as well as following specific requests.

The contribution lead to the establishment of several Reports on the coexistence of BS and MS, that were, subsequently, approved jointly be SG 5 and SG 6. One of these Reports provides substantive information on SAP/SAB (services auxiliary to broadcasting and broadcasting production) that share, on a secondary basis the UHF broadcasting bands (Report BT.2344). A Draft Recommendation on out-of-band emission limits for the mobile service (IMT) in the band 694-709 MHz (in order to protect the broadcasting service below 694 MHz) failed to be agreed in JTG 4-5-6-7. A later attempt to agree this draft in slightly modified form in SG 5 only, also failed and is now before the Assembly (ref. Documents [5/1001](http://www.itu.int/md/R12-SG05-RP-1001/en) and [5/1009](http://www.itu.int/md/R12-SG05-RP-1009/en)). Eventually, the output of JTG 4-5-6-7 was considered in the Report of CPM15-2 to WRC-15.

Other important results in the domain of WP 6A concerned:

a) System specifications and planning criteria for digital broadcasting (ITU-R Recommendations BT.2033 and BT.2036 and Report BT.2254) and multimedia broadcasting for mobile reception (ITU-R Recommendation BT.2052).

b) The ongoing transition to digital sound and TV broadcasting (ITU-R Report BT.2140).

c) Interference by wind turbines and wind-farms (ITU-R Recommendation BT.1893 and new Report BT.2142).

d) Interference from wireline transmissions (liaison with ITU-T SG 5 and 9, CISPR, and, especially for PLT, with CENELEC): The ongoing watching overview of potential issues between wired networks and their leakage or inadvertent interference into broadcast transmissions. This has also resulted in much improved inter sector liaison and communications between the T Sector and the R sector with the assistance of the Directors of the two sectors. There has also been a close liaison with Study Group 1 on these issues.

e) Creation of a new work stream on world-wide broadcasting roaming.

f) Emergency broadcasting (ITU-R Report BT.2299).

g) Green(er) broadcasting: The ITU-R Report BT.2385 describes three measures to reduce the carbon footprint:

– Going digital (less tx power due to the reduced C/(N+I) requirements and the reduction in the number of stations for the same size of service area)

– New technologies to improve the transmitter efficiency such as dynamic carrier control in AM BC, or Doherty amplification for digital broadcasting signals

– Use of renewable sources of energy (generated by sun and wind power)

h) Large survey on the future spectrum requirements, resulting on new Report BT.2387 “Spectrum / frequency requirements for bands allocated to broadcasting on a primary basis”.

i) Liaison with WHO on potential hazards of broadcast transmission.

**WP 6B** deals with broadcast signal coding and aggregation incl. the multiplexing aspects of accessibility. Furthermore, WP 6B defines digital interfaces and works on interactivity aspects. In short, WP 6B is responsible for any areas bridging programme production and broadcasting emission. Consequently, the WP ensures the continued cooperation with SG 4 on BSS (SG4 is responsible for all transmission and spectrum aspects whereas the baseband aspects remain dealt with by SG 6).

In this Study Period, WP 6B was instrumental in a number of areas, inter alia:

a) Integrated broadcast-broadband systems: Several Recommendations and Reports resulted from this work, which is coordinated with ITU-T SG 9 in the new IRG-IBB (Intersector Rapporteur Group on integrated broadcast-broadband systems

b) Digital interfaces for ultra high definition television (UHDTV): A Recommendation was completed for extremely high data-rates, much awaited in the industry (ITU-R Recommendation BT.2077)

c) Audio metadata and file formats for advanced sound systems (ITU-R Recommendation BS.2076 and a Draft Recommendation)

d) Use of new technologies for broadcasting systems such as HEVC (High Efficiency Video Coding), MMT (MPEG Media Transport) and IP-based transport

e) Creation of a new work stream on a global platform for the broadcasting service

f) Further work on VIS (video information systems).

**WP 6C** deals with productions issues, international exchange and quality evaluation. The outstanding subjects of WP 6C in this Study Period definitely concerned UHDTV and advanced sound technologies. Highlight was ITU-R Rec. BT.2020 which defines the video format for UHDTV that found unique worldwide acceptance. Ongoing work for UHDTV is on HDR-TV (high dynamic range television) and on associated wider colour gamut as well as on advanced sound systems.

Beyond Rec. BT.2020-1, important achievements of WP 6C within this Study Period comprise:

a) Main elements for Advanced sound system for programme production (new Rec. BS.2051)

b) A critical new Question 139/6 on Methods for Rendering Advanced Audio Formats. This question addresses the pivotal issue of how ‘audio objects’ are transformed into specific signals needed for the home loudspeaker arrangements

c) Methods for the assessment of audio and video quality (various new Recommendations)

d) Guidance on the use of UHDTV image systems for capturing, editing, finishing, and archiving high quality HDTV programmes (ITU-R Rec. BT.2050)

e) Extensive new Report on Colorimetry (new Report BT.2380 TV Colorimetry Elements)

f) Various new Recommendation on the production and exchange of 3D-TV signals

g) Several new Reports on video test material and methods, on multi-channel sound technology, the viewing of stereoscopic videos and the present state of UHDTV.

# 6 Activities and events for informing and assisting the ITU-R membership in broadcasting matters

In line with the ITU-R strategic objective of fostering the acquisition and sharing of knowledge and know-how on radiocommunications, the work of SG 6 was well visible inside and outside of ITU. Its activities and outputs were reported in the ITU News, the ITU Magazine, in ITU news flashes and in ITU press releases and in various ITU interviews. In addition, SG 6 contributed substantially to the development of a FAQ on the Digital Switchover and the Digital Dividend.

Several workshops and information sessions were organized by the SG 6 to present and demonstrate new developments in broadcasting technologies to delegates attending ITU-R and other Sector meetings, staff from Permanent Missions in Geneva and media representatives. The workshops on UHDTV, high-dynamic range and extended colour space (colour gamut), on emergency broadcasting and advanced sound systems were well attended. Other notable workshops and symposia organized by SG 6 are listed below:

– [Workshop on the Frequency and Network Planning Aspects of DVB-T2](http://www.itu.int/net/ITU-R/index.asp?category=study-groups&rlink=workshopdvb-t2&lang=en) (jointly with EBU), 23 April 2012

– [40 years of digital Television advancements](http://www.itu.int/net/ITU-R/index.asp?category=study-groups&rlink=40yrdtv&lang=en), 29 Oct 2012, see also the related [press release](https://itu4u.wordpress.com/2012/11/02/celebrating-professor-krivocheev-itu-dean-of-television-standards/)

– Internal WP 6A Workshop "Approaches for use of the broadcasting television spectrum" – Case studies in Australia, South Africa, the UK and USA, 23 October 2012 (see also 1.2.3 of Annex 1 to this document)

– [ITU-R Workshop on Emergency Broadcasting](http://www.itu.int/en/ITU-R/study-groups/workshops/RSG6-WSEBC-2013/Pages/default.aspx), 21 February 2013

– [Workshop on UHDTV](http://www.itu.int/oth/R0A07000035), 24 March 2014

– [ITU and UNESCO World Radio Day](http://www.itu.int/en/wrd15/Pages/default.aspx), hosted by ITU on 13 February 2015 (inc. associated technical demonstrations)

– [ITU International symposium on the digital switchover](http://www.itu.int/en/ITU-R/GE06-Symposium-2015/Pages/default.aspx) (GE-2006), 17 June 2015 (incl. associated panel discussions and technical demonstrations)

– [ITU-R Workshop “Topics on the Future of Audio in Broadcasting”](http://www.itu.int/en/ITU-R/study-groups/workshops/2015-TFAB/Pages/default.aspx), 15 July 2015.

# 7 Report of the Working Parties and Joint-Task-Group of Study Group 6

## 7.1 Working Party 6A

The progress and future work of Working Party 6A can be found in Section 1 of Annex 1 to this Report.

## 7.2 Working Party 6B

The progress and future work of Working Party 6B can be found in Section 2 of Annex 1 to this Report.

## 7.3 Working Party 6C

The progress and future work of Working Party 6C can be found in Section 3 of Annex 1 to this Report.

## 7.4 Joint Task Group 4-5-6-7

The Report on the work of JTG 4-5-6-7 from July 2012 to July 2014 can be found in Section 4 of Annex 1 to this Report.

# 8 Progress of the studies requested by ITU-R Resolutions

During the 19th meeting of the RAG in June 2012, it was requested that Study Group Chairmen report to the RAG the progress of the studies invited in the ITU-R Resolutions. Based on this request, the Chairman of Study Group 6 has continuously submitted the input to every RAG meeting.

The status of the studies, provisional outputs, ITU-R Recommendations and/or Reports and foreseen dates and deliverables in response to the ITU-R Resolutions relevant to Study Group 6 are provided in **Attachment 3**.

# 9 Cooperation with other organizations

There has been close cooperation with ITU-T Study Group 9 (in the areas of integrated broadcast-broadband systems (IBB), multimedia broadcasting, interactive broadcasting including audiovisual media accessibility (AVA) and audiovisual quality evaluation (AVQA), ITU-T Study Group 12 (on AVQA), ITU-T Study Group 15 (on PLT) and ITU-T Study Group 16 (on AVA and multimedia broadcasting).

Good cooperation has been maintained with the ITU-D Sector, in particular with ITU‑D Study Group 2 on the transition from analogue to digital television service. SG 6 experts were instrumental in the compilation of the “[Guidelines for the transition from analogue to digital broadcasting](http://www.itu.int/en/ITU-D/Spectrum-Broadcasting/Documents/Guidelines%20final.pdf)” and ITU-D Report on [Digital dividend - Insights for spectrum decisions](http://www.itu.int/net4/ITU-D/CDS/gq/generic/asp-reference/file_download.asp?FileID=4376). A lot of material from WP 6A was used in the establishment of the ITU-D Report on [Trends in Broadcasting - An overview of developments](http://www.itu.int/net4/ITU-D/CDS/gq/generic/asp-reference/file_download.asp?FileID=4389)) and ITU-D Q11 Report - Best Practices (Production, Distribution, Multiplex and Broadcasting Networks), Public Policies and Case Studies .

A Rapporteur represented Study Group 6 at discussions on ICTs and Climate at the relevant ITU-T Study Groups, notably with respect to the work of the Joint Coordination Activity on ICT and Climate Change (JCA ICT&CC), which reports to ITU-T SG.

The Study Group has maintained good and efficient liaison with major broadcasting organizations and other international standard-setting bodies, such as the ISO/IEC, in compliance with Resolution ITU-R 9-4. In accordance with the corresponding agreements, which have been posted on the Study Group website, there has been close cooperation with organizations like SMPTE and ETSI. The link to CISPR and CENELEC was assured via an appointed Rapporteur.

In line with Resolution 175 (Guadalajara, 2010), the Chairman actively contributed, in 2013, to ITU’s approach to the organizers of UEFA and the Paraolympic Games in order to promote accessibility services for their audiovisual coverages by 2016 (ITU initiative: Access to All, initiated by the Secretary General in 2013). Also in line with Resolution 175, live captioning was introduced in the meetings of SG 6.

In 2011, the scope of the scientific ITU “Kaleidoscope” conference was widened to include radiocommunication issues, and the Chairman of SG 6 was invited to participate in the preparation of all conferences since K-11. The next [Kaleidoscope](http://www.itu.int/en/ITU-T/academia/kaleidoscope/Pages/default.aspx) (K-15) will be held in Barcelona from 9-11 December 2015).

# 10 Conclusion and future work

The Study Group has worked very efficiently and effectively through its three Working Parties, which were set up in line with the guidelines in Resolution ITU-R 1-6, in particular § 2.5, which stipulates that “*a Study Group shall establish by consensus and maintain only the minimum number of Working Parties, normally three or four Working Parties*”. With the experience gained, it can be stated that the Study Group may continue with, in principle, the same structure for the forthcoming study period.

The Study Group has very effectively reviewed and consolidated its Questions and texts. With respect to the previous (2008-2011) Study Period, the total number of Questions had again been reduced from 64 at the start of the 2012-2015 Period to 43 at the end of this Study Period (assuming that the proposed suppression of 27 Question in CACE/746 will be approved). Where appropriate, similar issues had been combined in “umbrella Questions".

Nevertheless, important new Questions had been elaborated, *inter alia* on world broadcasting roaming and on the global platform for the broadcasting service.

As in the previous Study Period, the nomination of Vice-Chairmen for the Working Parties enabled the Working Parties to assign specific streams of activity to each of the Vice-Chairmen over the study period, thereby ensuring that various topics and areas of activity had continuous support and achieved good results.

All of these results have been achieved within the limits of the allocated budget for the whole period 2012-2015.

Regarding future work, Study Group 6 will concentrate its work, in particular, on the following:

• Work resulting from conclusions of WRC-15 and CPM19-1;

• Protection of the broadcasting service;

• Worldwide broadcasting roaming Recommendations;

• Access systems for the elderly and for persons with disabilities;

• Further convergence of broadcast and broadband delivery (hybrid broadcast broadband systems) including non-linear forms of broadcasting;

• New broadcasting systems and applications such as high-speed signal interfaces in studios including IP-based, high-efficiency compression coding, file formats, metadata and transport methods;

• Global platform for the broadcasting service;

• Beyond HDTV: 3DTV (without glasses if ever possible), UHDTV and multi-channel sound beyond the traditional 5.1/7.1 configuration, HDR-TV (high-dynamic range TV and extended colour space (“wide colour gamut”);

• Objective quality assessment of sound and television signals;

• Modernization of Recommendation ITU-R BT.500 (subjective video quality evaluation);

• New Handbook on DTTB (digital terrestrial television broadcasting);

• Further contributions to the area of Green ICT and the effects of climate change with respect to terrestrial broadcasting;

• Continued cooperation with ITU-T and ITU-D as well as other standardization bodies recognized by ITU (such as CISPR, ETSI, ISO/IEC or SMPTE).

Due account should continue to be given to the integral character of present-day broadcasting. The former division into sound, television and multimedia or file-based broadcasting is no longer the norm. Today’s digital transmission systems enable the combination of all types of audiovisual media as well as the convergence between broadcast and broadband delivery.

# 11 Acknowledgement

The Chairman of SG 6 would like to specially thank the Director, Mr. F. Rancy, for his continued wise guidance and support as well as the Head of the Study Group Department, Mr Colin Langtry, for his excellent coordination of the work of SG 6. Furthermore, the Chairman is highly thankful to the Working Party Chairmen and the numerous Rapporteurs and Leader of Rapporteur Groups. Only with their continued support and devotion, the important outputs of the Study Group could have been achieved.

The Chairman would also like to thank all delegates who have participated in the meetings of the Study Group and its Working Parties and in particular, the Administrations and Sector Members who have participated with a good spirit of cooperation to solve very delicate and important issues. This spirit of cooperation has established a very good friendship among all participants, which is reflected in all of the results achieved to date.

The Chairman is also grateful for the ever-wise advice of the Counsellors, Mr N. Venkatesh and Mr. P. Hai, and for the efficient and excellent support of Mrs E. Mostyn-Jones and her team. The Chairman is also thankful for the help provided by Mrs M.J. Deraspe and all those who provided support behind the scenes.

Special thanks go to the Honorary Chairman of SG 6, Prof. Krivocheev, for his continued dedication to the work of the Study Group and his continuous and invaluable advice.

Attachment 1

Structure of [Radiocommunication Study Group 6](http://www.itu.int/ITU-R/index.asp?category=study-groups&rlink=rsg6&lang=en)

(BROADCASTING SERVICE)

*Scope (excerpt)*: Radiocommunication broadcasting, including vision, sound, multimedia and data services principally intended for delivery to the general public.

Chairman: Mr C. Dosch (Germany)

Vice-Chairmen: Mr Mohamad Ayoub (Lebanon)

 Mr A.O. Bolarinwa (Nigeria)

 Mr. Roger Bunch (Australia)

 Mr Oleg Gofaizen (Ukraine)

 Ms Cecily Holiday (United States of America)

 Mr. Angaman Kesse (Côte d'Ivoire (Republic of))

 Ms Kyung Mee Kim (Korea)

 Mr Amir Hassan Nafez (Iran (Islamic Republic of))

 Mr Yukihiro Nishida (Japan)

 Mr Mohamed Saad Almarzouqi (United Arab Emirates)

 Mr Paolo Zaccarian (Italy)

 Mr. Qingjun Zeng (China)

Working Parties:

[**Working Party 6A**](http://www.itu.int/en/ITU-R/study-groups/rsg6/rwp6a/Pages/default.aspx)**:** Terrestrial broadcasting delivery

Chairman: Mr L. Olson (United States)

Vice-Chairmen: Mr R. Bunch (Australia), Mr M. Hate (UK), Mr A.H. Nafez (Iran),
Mr L. Rocchi (Italy) and Mr J. Song (China),

[**Working Party 6B**](http://www.itu.int/en/ITU-R/study-groups/rsg6/rwp6b/Pages/default.aspx)**:** Broadcast service assembly and access

Chairman: Mr Y. Nishida (Japan)

Vice-Chairmen: Mr P. Dare (Sony), Dr S. Hirakawa (Japan) and Dr P. Zaccarian (Italy)

[**Working Party 6C**](http://www.itu.int/en/ITU-R/study-groups/rsg6/rwp6c/Pages/default.aspx)**:** Programme production and quality assessment

Chairman: Dr D. Wood (EBU)

Vice-Chairmen: Mr V. Baroncini (Italy), Mr S. Lieng (Australia) and Mr C. Todd (USA)

**Joint Task Groups:**

[**Joint Task Group 4-5-6-7**](http://www.itu.int/en/ITU-R/study-groups/jtg4-5-6-7/Pages/default.aspx) WRC-15 agenda items 1.1 and 1.2

Chairman Mr. Thomas Ewers (Germany) / Mr. Martin Fenton (UK)

[Intersector Rapporteur Groups (IRG)](http://www.itu.int/en/irg/Pages/default.aspx)

[IRG-AVA](http://www.itu.int/en/irg/ava/Pages/default.aspx) Intersector Rapporteur Group on Audiovisual Media Accessibility
(ITU-T SG9, ITU-T SG16 and ITU-R SG6)

Co-Chairmen Mr. D.Wood (EBU) for ITU-R SG 6

 Ms. M. Pinson (USA) for ITU-T SG 9

 Mr. M. Kawamori (Japan), *a.i.* for ITU-T SG 16

[IRG-AVQA](http://www.itu.int/en/irg/avqa/Pages/default.aspx) Intersector Rapporteur Group on Audiovisual Quality Assessment
(ITU-T SG9, ITU-T SG12 and ITU-R SG6)

Co-Chairmen Mr. C. Lee (Korea, Rep of) for ITU-R SG 6

 Mr. Q. Huynh-Thu (Australia) for ITU-T SG 9

 Mr. J. Berger (Germany) for ITU-T SG 12

[IRG-IBB](http://www.itu.int/en/irg/ibb/Pages/default.aspx) Intersector Rapporteur Group Integrated Broadcast-Broadband
(ITU-T SG9, ITU-R SG6 and ITU-T SG16)

Co-Chairmen Ms. A. E. Faria e Silva (Brazil) for ITU-R SG 6

 Mr. M. Takechi (Japan) for ITU-T SG 12

Attachment 2

List of ITU-R Reports from Study Group 6

(BROADCASTING SERVICE)

**ITU-R BR-series of Reports**

**ITU-R BS-series of Reports**

**ITU-R BT-series of Reports**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NOC** = Maintained | **MOD** = Revised  | **SUP** =Deleted | **ADD** =New text | **UNA** = Undergoing approval |

Summary: During this reporting period, 30 New Reports had been developed (marked ADD) and 25 Reports had been modified (marked MOD)

Some Reports, such as BT.2140, are continuously revised in order to reflect the ongoing development (in the case of BT.2140, with respect to the transition from analogue to digital television).

**ITU-R BS Series of Reports**

**Broadcasting service (sound)**

| Report ITU-R | Report title | Status |
| --- | --- | --- |
| [**BS.300**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.300) | Stereophonic or multi-dimensional sound in frequency-modulation sound  | NOC |
| [**BS.302**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.302) | Interference to sound broadcasting in the shared bands in the Tropical Zone  | NOC |
| [**BS.303**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.303) | Determination of the effects of atmospheric noise on the grade of reception in the Tropical Zone  | NOC |
| [**BS.304**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.304) | Fading characteristics for sound broadcasting in the Tropical Zone    | NOC |
| [**BS.401**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.401) | Transmitting antennas in LF and MF broadcasting    | NOC |
| [**BS.458**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.458) | Characteristics of systems in LF, MF and HF broadcasting    | NOC |
| [**BS.463**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.463) | Transmission of several sound programmes or other signals with a single transmitter in frequency-modulation sound broadcasting    | NOC |
| [**BS.464**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.464) | Polarization of emissions in frequency-modulation broadcasting in band 8 (VHF)    | NOC |
| [**BS.472**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.472) | Single-sideband reception for re-broadcasting applications within the Tropical Zone    | NOC |
| [**BS.516**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.516) | Field strength resulting from several electromagnetic fields    | NOC |
| [**BS.799**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.799) | Subjective assessment of quality of sound in broadcasting using digital techniques    | NOC |
| [**BS.943**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.943) | Protection of sound-broadcasting stations against atmospheric electricity    | NOC |
| [**BS.944**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.944) | Theoretical network planning    | NOC |
| [**BS.945**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.945) | Methods for the assessment of multiple interference    | NOC |
| [**BS.946**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.946) | Frequency-planning constraints of FM sound broadcasting in band 8 (VHF)    | NOC |
| [**BS.1058**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.1058) | Minimum AF and RF signal-to-noise ratio required for broadcasting in band 7 (HF)    | NOC |
| [**BS.1059**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.1059) | Characteristics of single-sideband systems in HF broadcasting    | NOC |
| [**BS.1060**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.1060) | Energy saving methods in amplitude modulation broadcasting and their influence on reception quality    | NOC |
| [**BS.1063**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.1063) | Prediction and control of re-radiation in MF broadcasting    | NOC |
| [**BS.1065**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.1065) | The RF spectrum of frequency-modulation sound-broadcasting transmitters    | NOC |
| [**BS.1067**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.1067) | Improvement of the reception quality in automobiles for frequency modulation sound broadcasts in band 8 (VHF)    | NOC |
| [**BS.1071**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.1071) | Sampling frequency conversion and synchronization of digital sound signals    | NOC |
| [**BS.1200**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.1200) | The effect of delay in sound-programme operations    | NOC |
| [**BS.1201**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.1201) | Number of HF sound broadcasting transmitters using a single channel    | NOC |
| [**BS.1203**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.1203) | Digital sound broadcasting to vehicular, portable and fixed receivers using terrestrial transmitters in the UHF/VHF bands    | NOC |
| [**BS.1204**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.1204) | Automatic synchronization of video and audio after transmission    | NOC |
| [**BS.2001**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2001) | Ancillary services for the visually impaired and hearing impaired in multi-channel sound systems    | NOC |
| [**BS.2002**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2002) | Introduction of satellite and complementary terrestrial digital sound broadcasting in the WARC-92 frequency allocations    | NOC |
| [**BS.2037**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2037) | Evaluating fields from terrestrial broadcasting transmitting systems operating in any frequency band for assessing exposure to non-ionizing radiation    | NOC |
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| [**BS.2103**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2103) | Short-term loudness metering   | NOC |
| [**BS.2104**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2104) | FM modulator interference to broadcast services    | NOC |
| [**BS.2105**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2105) | Information relating to the HF broadcasting service    | NOC |
| [**BS.2144**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2144) | Planning parameters and coverage for Digital Radio Mondiale (DRM) broadcasting at frequencies below 30 MHz    | ADD |
| [**BS.2159**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2159) | Multichannel sound technology in home and broadcasting applications   | MOD (4) |
| [**BS.2161**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2161) | Low delay audio coding for broadcasting applications   | NOC |
| [**BS.2208**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2208) | Possible use of VHF Band I for digital sound broadcasting services | NOC |
| [**BS.2213**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2213) | Impact of audio signal processing and compression techniques on terrestrial FM sound broadcasting emissions at VHF    | MOD (2) |
| [**BS.2214**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2214) | Planning parameters for terrestrial digital sound broadcasting systems in VHF bands    | MOD |
| [**BS.2217**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2217) | Compliance material for Recommendation ITU-R BS.1770    | MOD |
| [**BS.2251**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2251) | Digital Radio Mondiale in the 26 MHz band (25 670-26 100 kHz)    | MOD |
| [**BS.2266**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2266) | Framework of future audio broadcasting systems    | ADDMOD (2) |
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| [**BS.2388**](http://www.itu.int/pub/R-REP-BS/publications.aspx?lang=en&parent=R-REP-BS.2388) | Usage guidelines for the audio definition model and multichannel audio files | ADD |

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**Broadcasting service (television)**

| Report ITU-R | Report title | Status |
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| [**BT.2017**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2017) | Stereoscopic television MPEG-2 multi-view profile    | NOC |
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| [**BT.2052**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2052) | Protection of end-users' privacy in interactive broadcasting systems    | NOC |
| [**BT.2053**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2053) | Large screen digital imagery    | NOC |
| [**BT.2069**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2069) | Tuning ranges and operational characteristics of terrestrial electronic news gathering (ENG), television outside broadcast (TVOB) and electronic field production (EFP) systems    | MOD |
| [**BT.2070**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2070) | Broadcasting of content protection signalling for television   | NOC |
| [**BT.2075**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2075) | Protection requirements for terrestrial television broadcasting services in the 620-790 MHz band against potential interference from GSO and non-GSO broadcasting-satellite systems and networks    | NOC |
| [**BT.2088**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2088) | Stereoscopic television    | NOC |
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| [**BT.2137**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2137) | Coverage prediction methods and planning software for digital terrestrial television broadcasting (DTTB) networks    | NOC |
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| [**BT.2143**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2143) | Boundary coverage assessment of digital terrestrial television broadcasting signals    | NOC |
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| [**BT.2248**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2248) | A conceptual method for the representation of loss of broadcast coverage    | NOC |
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| [**BT.2250**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2250) | Delivery of wide colour gamut image content through SDTV and HDTV delivery systems    | NOC |
| [**BT.2252**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2252) | Objective quality coverage assessment of digital terrestrial television broadcasting signals of Systems A and B    | ADDMOD |
| [**BT.2253**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2253) | GPS timing receivers for DVB-T SFN application: 10 MHz phase recovery    | ADD |
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| [**BT.2267**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2267) | Integrated broadcast-broadband systems    | ADDMOD (5) |
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| [**BT.2296**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2296) | Example of application of Recommendation ITU-R BT.1895 and Report ITU-R BT.2265 to assess interference to the broadcasting service caused by the impact of IMT systems on existing head amplifiers of collective television distribution systems    | ADD |
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| [**BT.2337**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2337) | Sharing and compatibility studies between digital terrestrial television broadcasting and terrestrial mobile broadband applications, including IMT, in the frequency band 470-694/698 MHz    | NOC |
| [**BT.2338**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2338) | Services ancillary to broadcasting/services ancillary to programme making spectrum use in Region 1 and the implication of a co-primary allocation for the mobile service in the frequency band 694-790 MHz    | NOC[[1]](#footnote-1) |
| [**BT.2339**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2339) | Co-channel sharing and compatibility studies between digital terrestrial television broadcasting and international mobile telecommunication in the frequency band 694-790 MHz in the GE06 planning area    | NOC |
| [**BT.2341**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2341) | TV receiver subjective picture failure thresholds and the associated minimum quasi error free levels for good quality reception    | ADD |
| [**BT.2342**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2342) | Production, emission and exchange of closed captions for all worldwide language character sets (latin and non-latin)    | ADD |
| [**BT.2343**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2343) | Collection of field trials of UHDTV over DTT networks    | ADD |
| [**BT.2344**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2344) | Information on technical parameters, operational characteristics and deployment scenarios of SAB/SAP as utilized in broadcasting    | ADD |
| [**BT.2380**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2380) | TV colorimetry elements | ADD |
| [**BT.2381**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2381) | Requirements for High Dynamic Range Television (HDR-TV) Systems | ADD |
| [**BT.2382**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2382) | Description of interference into a DTT receiver | ADD |
| [**BT.2383**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2383) | Characteristics of DTTB systems in the frequency band 470-862 MHz for frequency sharing/interference analyses | ADD |
| [**BT.2384**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2384) | Implementation considerations for the introduction and transition to digital terrestrial sound and multimedia broadcasting   | ADD |
| [**BT.2385**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2385) | Reducing the environmental impact of terrestrial broadcasting systems | ADD |
| [**BT.2386**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2386) | Digital Terrestrial Broadcasting: Design and implementation of single frequency networks (SFN) | ADD |
| [**BT.2387**](http://www.itu.int/pub/R-REP-BT/publications.aspx?lang=en&parent=R-REP-BT.2387) | Spectrum / frequency requirements for bands allocated to broadcasting on a primary basis | ADD |

Attachment 3

Progress of the studies requested in the ITU-R Resolutions
relevant to Study Group 6

| ITU-R Res. | Title | WP | Status of studies | Provisional output | Foreseen dates and deliverables  |
| --- | --- | --- | --- | --- | --- |
| 1-6 | Working methods for the Radiocommunication Assembly, the Radiocommunication Study Groups, and the Radiocommunication Advisory Group | SG 6 |  |  | Contributed to the work of RAG Correspondence Group on the revision of Resolution ITU-R 1-6 |
| 4-6 | Structure of Radiocommunication Study Groups | SG 6 |  |  |  |
| 6-1 | Liaison and collaboration with the ITU Telecommunication Standardization Sector | SG 6 | Three Intersector Rapporteur Groups IRG-AVA on audiovisual media accessibility, IRG-AVQA on audiovisual quality assessments and IRG-IBB on Integrated Broadcast Broadband Systems were established. |  | Contribution to RAG Correspondence Group to provide update to Res. 6-1 before RA-15 (as appropriate) |
| 9-4 | Liaison and collaboration with other relevant organizations, in particular ISO and IEC | SG 6 | The Study Group, in accordance with this Resolution, maintains close collaboration with ISO and IEC and develops common text, including Recommendations. SG 6 also collaborates with other organizations like ETSI, SMPTE, ARIB, HbbTV, OMA, ABNT, TIA, in developing Recommendations with common text. |  | Ongoing |
| 12-1 | Handbooks and special publications for development of radiocommunication services | 6A | Working Party 6A had published a Handbook on “Digital terrestrial television broadcasting in the VHF/UHF bands”. This Handbook from 2002 should eventually be replaced/ complemented by a new Handbook. A Rapporteur Group was established to develop this new Handbook on Digital Terrestrial Television (DTTB) and multimedia Implementation. |  | Ongoing |
| 33-3 | Preparation of texts on terminology | SG6 | The Study Group has been forwarding terms and definitions to the CCV following each meeting where it has agreed to have ITU-R Recommendations sent for the adoption and approval procedure. These terms and definitions are for inclusion in the ITU Terminology database. |  | Ongoing |
| 34-3 | Guidelines for the preparation of terms and definitions | SG6 |  | Ongoing |
| 35-3 | The organization of vocabulary work covering terms and definitions | SG6 |  | Ongoing |
| 36-3 | Coordination of vocabulary | SG6 |  | Ongoing |
| 37 | Radiowave propagation studies for system design and service planning | 6A |  |  | Ongoing |
| 53‑1 | The use of radiocommunications in disaster response and relief | 6A | ITU-R Report was approved by SG 6 at its April 2014 meeting and published as BT.2299.Working Party 6A held a Workshop on “Emergency Broadcasting” on 21 November 2013 during the block meetings of Study Group 6. | Annex 12 to Doc. 6A/562 | Report ITU-R BT.2299 published in August 2015 |
| 55‑1 | ITU studies of disaster prediction, detection, mitigation and relief | 6A | Recommendation ITU-R BT.1774 “Use of satellite and terrestrial broadcast infrastructures for public warning, disaster mitigation and relief” was published in 2007. | Annex 12 to Doc. 6A/562 | Draft revision of Recommendation ITU-R BT.1774 – Broadcasting for Public Warning, Disaster Mitigation and Relief is under approval (CACE/747) |
| 58 | Studies on the implementation and use of cognitive radio systems | 6A | There had been no further inputs to the WP 6A Report [CRS\_BS\_BANDS] for a considerable time. WP 6A, at its November 2014 meeting, decided that the work on this Report be stopped and the incomplete Report be suppressed. |  | WP 6A continues to contribute to the Report currently being prepared by WP 1A which is the lead group for the studies |
| 59 | Studies on availability of frequency bands and/or tuning ranges for worldwide and/or regional harmonization and conditions for their use by terrestrial electronic news gathering systems | 6A | Recommendation ITU-R BT.1872 “User requirements for digital electronic news gathering” was approved in 2007.The Revision of Report ITU-R BT.2069-5 “Spectrum usage and operational characteristics of terrestrial electronic news gathering (ENG), television outside broadcast (TVOB) and electronic field production (EFP) systems” was approved by SG 6 at its meeting in February 2015. It was published on the web as Report ITU-R BT.2069-6.Draft revision of Recommendation ITU-R BT.1871 – User requirements for wireless microphones was agreed by SG 6 in Feb. 2015 and has been circulated for adoption and approval. |  |  |
| 60 | Reduction of energy consumption for environmental protection and mitigating climate change by use of ICT/radiocommunication technologies and systems | SG 6 | Study Group 6 and its Working Parties are working on further reduction of energy consumption in broadcasting through the “green broadcasting” and “sustainable broadcasting” initiatives. The SG 6 Rapporteur for JCA-ICT&CC work (Joint Coordination Activity on ICT and Climate Change) had finished its consideration.Broadcasting has already achieved substantial energy reductions through the transition from analogue to digital TV broadcasting, which is under way or completed in many parts of the world. | Annex 3 to Doc. 6A/562 | The SG 6 Chairman will continue his consultations with the ITU-T SG 5 Chairman on this issue (JCA-ICT&CC is reporting to ITU-T SG 5. A new Report ITU-R BT.2385Reducing the environmental impact of terrestrial broadcasting systems was approved in July 2015. |
| 62 | Studies related to testing for conformance with ITU R Recommendations and interoperability of radiocommunication equipment and systems | SG 6 | Report ITU-R BT2295 on digital terrestrial broadcasting systems was approved in November 2013.  |  |  |

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1. Currently under revision in collaboration with SG 5 (see Annex 6 to 6A/652) [↑](#footnote-ref-1)