



## Radiocommunication Bureau (BR)

Administrative Circular  
CACE/752

21 September 2015

**To Administrations of Member States of the ITU, Radiocommunication Sector Members and ITU-R Associates participating in the work of Radiocommunication Study Group 4**

**Subject: Radiocommunication Study Group 4 (Satellite services)**

- **Adoption of 1 new ITU-R Recommendation, 6 revised ITU-R Recommendations and 2 new ITU-R Questions and their simultaneous approval by correspondence in accordance with § 10.3 of Resolution ITU-R 1-6 (Procedure for the simultaneous adoption and approval by correspondence)**

By Administrative Circular CACE/737 dated 9 July 2015, 1 draft new ITU-R Recommendation, 6 draft revised ITU-R Recommendations and 2 draft new ITU-R Questions were submitted for simultaneous adoption and approval by correspondence (PSAA), following the procedure of Resolution ITU-R 1-6 (§ 10.3).

The conditions governing this procedure were met on 9 September 2015, with the exception of the adoption of draft new Recommendation ITU-R M.[AMS(R)S.METHODOLOGY]-0 which will be sent to the Radiocommunication Assembly 2015 (RA-15).

The approved Recommendations and Questions will be published by the ITU. Annex 1 to this Circular provides the titles of the approved Recommendations, with the assigned numbers. Annexes 2 and 3 provide the texts of the approved Questions.

François Rancy  
Director

**Annexes: 3**

**Distribution:**

- Administrations of Member States of the ITU and Radiocommunication Sector Members participating in the work of Radiocommunication Study Group 4
- ITU-R Associates participating in the work of Radiocommunication Study Group 4
- Chairmen and Vice-Chairmen of Radiocommunication Study Groups and the Special Committee on Regulatory/Procedural Matters
- Chairman and Vice-Chairmen of the Conference Preparatory Meeting
- Members of the Radio Regulations Board
- Secretary-General of the ITU, Director of the Telecommunication Standardization Bureau, Director of the Telecommunication Development Bureau

## Annex 1

### Titles of the approved ITU-R Recommendations

Recommendation ITU-R M.2014-1

Doc. 4/94(Rev.1)

#### **Global circulation of IMT satellite terminals**

Recommendation ITU-R M.1831-1

Doc. 4/102(Rev.2)

#### **A coordination methodology for RNSS inter-system interference estimation**

Recommendation ITU-R M.2031-1

Doc. 4/103(Rev.1)

#### **Characteristics and protection criteria of receiving earth stations and characteristics of transmitting space stations in the radionavigation-satellite service (space-to-Earth) operating in the band 5 010-5 030 MHz**

Recommendation ITU-R M.1906-1

Doc. 4/104(Rev.1)

#### **Characteristics and protection criteria of receiving space stations and characteristics of transmitting earth stations in the radionavigation-satellite service (Earth-to-space) operating in the band 5 000-5 010 MHz**

Recommendation ITU-R S.1717-1

Doc. 4/113(Rev.1)

#### **Electronic data file format for earth station antenna patterns**

Recommendation ITU-R S.1587-3

Doc. 4/114(Rev.1)

#### **Technical characteristics of earth stations on board vessels communicating with FSS satellites in the frequency bands 5 925-6 425 MHz and 14-14.5 GHz which are allocated to the fixed-satellite service**

## Annex 2

### QUESTION ITU-R 292/4

#### UHDTV satellite broadcasting systems

(2015)

The ITU Radiocommunication Assembly,

*considering*

- a)* that preferences of television viewers have diversified, including high-resolution video images;
- b)* that means for improving the flexibility and efficiency of the frequency spectrum are under constant investigation;
- c)* that an increase in the transmission capacity is required in order to realize ultra-high definition television (UHDTV) satellite broadcasting in a single satellite transponder;
- d)* that there have been significant developments in efficient modulation and channel coding techniques, including but not limited to formats such as amplitude phase shift keying (APSK) and low density parity check (LDPC) codes;
- e)* that advances in video and audio compression techniques that can meet the UHDTV format have shown the practicality of transmitting more than one UHDTV service per satellite transponder;
- f)* that UHDTV satellite broadcasting can accommodate both MPEG transport stream packets and IP packets;
- g)* that flexible transmission and multiplexing configurations enable integration of UHDTV satellite broadcasting into the IP network;
- h)* that the availability requirements of these different services, including UHDTV, can vary in accordance with their application,

*noting*

that Recommendation ITU-R BT.2020 - Parameter values for ultra-high definition television systems for production and international programme exchange, specifies UHDTV image system parameters,

*decides* that the following Questions should be studied

- 1 What are suitable and/or optimal modulation and channel coding techniques for UHDTV satellite broadcasting systems, what are practical channel transmission rates (capacity), and what performance is achievable (e.g. BER as a function of  $C/N$ ,  $C/I$ ,  $SNR$  and  $E_b/N_0$ )?
- 2 What are appropriate availability performance requirements and bit error rate requirements for the transmission of these UHDTV satellite broadcasting systems?

3 What are appropriate error-control techniques and/or error-concealment processes that optimize quality, bandwidth and cost considerations?

4 What protection ratios are required between two digital signals and between a digital signal and other types of signals that are likely to be transmitted in the band allocated to the broadcasting-satellite service?

5 What are the practical schemes that need to be taken into account in satellite broadcasting systems when encountering rain attenuation, which differs by climatic zones?

6 What are the practical schemes when satellite transponder nonlinearity causing signal distortion is encountered?

*further decides*

1 that the results of the above studies should be included in appropriate Recommendations and/or Reports;

2 that the above studies should be completed by 2017.

Category: S1

### Annex 3

#### QUESTION ITU-R 293/4

#### **Antenna radiation diagrams/patterns for small ( $D/\lambda^1$ around 30) earth station antennas used in fixed-satellite and broadcasting-satellite systems**

(2015)

The ITU Radiocommunication Assembly,

*considering*

- a) that earth station reference antenna patterns for the fixed-satellite service (FSS) and the broadcasting-satellite service (BSS) are used in determination of coordination requirements in accordance with the Radio Regulations;
- b) that the identification of coordination requirements and/or interference assessments between FSS/BSS networks, as well as between FSS/BSS earth stations and systems of other services sharing the same frequency band, depends on the reference antenna patterns used in analysis;
- c) that use of unnecessarily conservative reference antenna patterns can lead to an increase in the number of networks identified as potentially affected and thereby make it difficult for the involved administrations to complete coordination;
- d) that the range of applicability of current and future reference antenna patterns needs to be precisely defined (i.e. the applicable range of input parameters, the applicable frequency bands, etc.);
- e) that the definition of both antenna patterns and their associated range of applicability needs to be based on measurements;
- f) that new antenna design and technology (e.g. non-circular reflectors, special feed horn design) could lead to lower side lobe levels than in the current reference antenna patterns;
- g) that the new antenna technology such as phased arrays may also be taken into account in the development of new antenna patterns;
- h) that the ITU Radiocommunication Bureau has developed an antenna pattern software library used in conjunction with all software used in the application of the relevant procedures of the Radio Regulations,

*noting*

- a) that there are some FSS/BSS earth stations antenna patterns in existing ITU-R Recommendations as for example ITU-R S.465, ITU-R S.580, ITU-R BO.1213, ITU-R S.1855 that are used for antenna size  $D/\lambda$  around 30;
- b) that identification for the need of coordination in BR IFIC special sections in many cases refer to satellite networks at very distant positions because of the comparatively high side lobe levels of the FSS/BSS earth stations reference antenna patterns especially at off-axis angles beyond 40 degrees,

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<sup>1</sup> D is the antenna dimension in the measurement plane (m),  $\lambda$  is the wavelength (m).

*decides* that the following Questions should be studied

- 1 What are the measured radiation characteristics of small FSS/BSS earth station antennas especially in the vicinity of the off-axis angles of 40 degrees and beyond?
- 2 What are the reference patterns applicable to FSS/BSS earth station antennas with  $D/\lambda$  around 30?
- 3 What range of applicability could be associated with any new FSS/BSS reference antenna pattern (frequency bands, antenna diameter, etc.)?
- 4 Can the range of applicability of existing FSS/BSS reference antenna patterns be extended to small antennas?
- 5 How could the existing or new small ( $D/\lambda$  around 30) earth station antenna patterns be improved/developed taking into account the recent technological development including the phased array antennas and the measured antenna diagrams?
- 6 What are the necessary parameters to implement reference antenna patterns in software tools developed by the ITU Radiocommunication Bureau?

*further decides*

- 1 that the results of the above studies should be included in appropriate Recommendations and/or Reports;
- 2 that the above studies should be completed by 2019.

Category: S2

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