



Radiocommunication Bureau (BR)

Administrative Circular  
CACE/756

9 October 2015

**To Administrations of Member States of the ITU, Radiocommunication Sector Members and ITU-R Associates participating in the work of Radiocommunication Study Group 5**

**Subject: Radiocommunication Study Group 5 (Terrestrial services)**

- **Adoption of 4 new ITU-R Questions and 6 revised 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)**
- **Suppression of 6 ITU-R Questions**

By Administrative Circular CACE/743 dated 31 July 2015, 4 draft new ITU-R Questions and 6 draft revised ITU-R Questions were submitted for simultaneous adoption and approval by correspondence (PSAA), following the procedure of Resolution ITU-R 1-6 (§ 10.3). In addition, the Study Group proposed the suppression of 6 ITU-R Questions.

The conditions governing this procedure were met on 1 October 2015.

The texts of the approved Questions are attached for your reference in Annexes 1 to 10 and will be published in Revision 4 to Document [5/1](#) which contains the ITU-R Questions approved by the 2012 Radiocommunication Assembly and assigned to Radiocommunication Study Group 5. Annex 11 provides the list of suppressed Questions.

François Rancy  
Director

**Annexes: 11**

**Distribution:**

- Administrations of Member States of the ITU and Radiocommunication Sector Members participating in the work of Radiocommunication Study Group 5
- ITU-R Associates participating in the work of Radiocommunication Study Group 5
- 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

### QUESTION ITU-R 256/5

#### **Technical and operational characteristics of the land mobile service in the frequency range 275-1 000 GHz**

(2015)

The ITU Radiocommunication Assembly,

*considering*

- a) that there is a growing demand for high speed and large capacity radiocommunications having data rates of several tens of Gbit/s to over 100 Gbit/s for land mobile service applications;
- b) that due to progress in the recent terahertz technologies, the integrated devices and circuits operating above 275 GHz can achieve various sophisticated applications;
- c) that the above devices and circuits could provide such high speed and large capacity radiocommunications for land mobile service systems;
- d) that standard development organizations such as IEEE are developing standards for terahertz wireless systems which utilize the broadband contiguous bandwidth larger than 50 GHz using the frequency range above 275 GHz;
- e) that broadband contiguous bandwidths larger than 50 GHz for the land mobile service are not available in the frequency range below 275 GHz;
- f) that certain parts of the frequency range 275-1 000 GHz are identified for use by administrations for passive service applications in Radio Regulations No. **5.565**;
- g) that the use of the frequency range 275-1 000 GHz by the passive services does not preclude the use of this range by active services;
- h) that the technical and operational characteristics of the land mobile service need to be specified for sharing and compatibility studies with the passive service applications indicated in *considering f)*,

*recognizing*

- a) that Report ITU-R SM.2352 provides the technology trends of active services in the frequency range 275-3 000 GHz;
- b) that Report ITU-R RA.2189 initiated sharing studies between the radio astronomy service and active services in the frequency range 275-3 000 GHz,

*decides* that the following Question should be studied

What are the technical and operational characteristics of the land mobile service in the frequency range 275-1 000 GHz?

*further decides*

- 1 that sharing studies between the land mobile and passive services, as well as the land mobile and other active services should be carried out, taking into account the characteristics mentioned in *decides*;
- 2 that the results of studies in the frequency range 275-1 000 GHz should be brought to the attention of the other Study Groups;
- 3 that the results of the above studies should be included in one or more Recommendations, Reports or Handbooks;
- 4 that the above studies should be completed by 2019.

Category: S2

## Annex 2

### QUESTION ITU-R 257/5

#### **Technical and operational characteristics of stations in the fixed service in the frequency range 275-1 000 GHz**

(2015)

The ITU Radiocommunication Assembly,

*considering*

- a) that there is a growing demand for high speed and large capacity radiocommunications having data rates of several tens of Gbit/s to sometime over 100 Gbit/s for fixed service systems;
- b) that due to progress in the recent terahertz technologies, the integrated devices and circuits operating above 275 GHz can achieve various sophisticated applications;
- c) that the above devices and circuits will be able to provide such high speed and large capacity radiocommunications for fixed service systems;
- d) that the traffic demands for backhaul and fronthaul for mobile systems are increasing due to mobile broadband communications such as IMT-Advanced;
- e) that certain parts of the spectrum in the frequency range 275-1 000 GHz are identified for passive services in the Radio Regulations;
- f) that the use of the frequency range 275-1 000 GHz by the passive services does not preclude use of this range by active services;
- g) that the technical and operational characteristics of the fixed service need to be specified for sharing and compatibility studies with the passive service applications indicated in *considering f)*,

*recognizing*

- a) that Report ITU-R SM.2352 provides the technology trends of active services in the frequency range 275-3 000 GHz;
- b) that Report ITU-R F.2323 provides guidance on the future development of the fixed service operating in the millimetre-wave band;
- c) that Recommendations ITU-R F.2004 and ITU-R F.2006 recommend radio-frequency channel and block arrangements for fixed wireless systems operating in the 92-95 GHz range and in the 71-76 and 81-86 GHz bands, respectively;
- d) that Report ITU-R F.2107 provides characteristics and applications of fixed wireless systems operating in frequency ranges between 57 GHz and 134 GHz;
- e) that Report ITU-R RA.2189 initiated sharing studies between radio astronomy service and active services in the frequency range 275-3 000 GHz,

*decides* that the following Question should be studied

What are the technical and operational characteristics of the fixed service in the frequency range 275-1 000 GHz?

*further decides*

- 1 that sharing studies between the fixed and passive services, as well as the fixed and other active services should be carried out taking into account the characteristics mentioned in *decides*;
- 2 that the results of studies in the frequency range 275-1 000 GHz should be brought to the attention of the other Study Groups;
- 3 that the results of the above studies should be included in one or more Recommendations, Reports, or Handbooks;
- 4 that the above studies should be completed by 2019.

Category: S2

### Annex 3

#### QUESTION ITU-R 258/5

#### **Technical and operational principles for HF sky-wave communication stations to improve the man-made noise HF environment<sup>1</sup>**

(2015)

The ITU Radiocommunication Assembly,

*considering*

- a) environmental factors that impact ionospheric communication and the features of HF time varying channel parameters are fundamentally unchanging aspects of physics;
- b) that in the framework of fixed frequency assignment and frequency-band allocation, non-cooperative frequency and power competition in shared frequency bands causes congestion of the HF frequency range, mutual interference, and low spectrum utility efficiency and have become prime reasons for the HF environment degradation;
- c) that mutual interference in HF sky-wave propagation is difficult to mitigate by geographic isolation, it has global influences to HF communications;
- d) that to overcome channel interference, users often increase emission power which results in overall higher background noise in the HF environment;
- e) that the HF frequency spectrum resource is limited, while HF applications are extending and the number of licensed users are increasing with time;
- f) that most existing HF communication technologies and new emerging cognitive radio technology cannot on their own offer an acceptable solution to the problem of HF environment degradation;
- g) that there is a need for principles to be developed that would result in overall more efficient use of HF spectrum, requiring self-management principles such as minimizing emission power, the use of adaptive techniques for frequency selection, and the use of more efficient transmission modes (e.g., digital),

*recognizing*

- a) that Resolution **729 (Rev.WRC-07)** has specified use of frequency adaptive systems in the MF and HF bands;
- b) that Article **12** has specified principle on use and coordination procedure of high frequency broadcasting, and Recommendation **522 (WRC-97)** has specified coordination of HF broadcasting schedules;

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<sup>1</sup> This Question should be brought to the attention of Study Groups 3 and 6.

c) that RR Nos. **5.143**, **5.143A**, **5.143B**, and **5.152** have limited emission power of fixed services in common frequency band of broadcasting or amateur service,

*noting*

a) that Recommendation ITU-R F.1611 has provided guidance on adaptive HF system planning and operation using prediction methods while addressing frequency planning, power budget, etc.;

b) that Recommendation ITU-R F.1110 has recommended to reduce the interference between users by reducing the communication period;

c) that ITU-R has developed a Handbook on frequency adaptive communications systems and networks in the MF/HF bands which describes the nature of adaptive HF systems and their use;

d) that Recommendation ITU-R SM.329, Recommendation ITU-R SM.1541 and Appendix **3** to Radio Regulations (**Rev.WRC-12**) have indicated the limits for unwanted emissions in the spurious domain and out-of-band domain for wireless equipment;

e) that Recommendation ITU-R P.372 provided information on the background levels of radio-frequency noise in the frequency range from 0.1 Hz to 100 GHz,

*decides* that the following Questions should be studied

1 What technical and operational principles can administrations implement to better manage the man-made noise HF environment and reduce the background noise in HF bands? Taking into account:

- techniques for evaluating the mutual interference in HF sky-wave communications and frequency sharing;
- technical measures and operational requirements for mitigating or avoiding mutual interference among HF sky-wave communication stations while frequency sharing;
- new HF frequency techniques used for both frequency cooperative and frequency sharing in different HF sky-wave communication systems;
- limiting requirements for unwanted emission power of HF systems;
- multilateral or regional coordination mechanisms for frequency sharing for HF sky-wave communications,

2 What principles can be developed with the resulting aim of a reduction of overall man-made noise in the HF frequency range?

*further decides*

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

2 that initial results of the above studies should be completed by 2019.

Category: S2

## Annex 4

### QUESTION ITU-R 259/5\*

#### **Operational and radio regulatory aspects for planes operating in the upper level of the atmosphere**

(2015)

The ITU Radiocommunication Assembly,

*considering*

- a) that the radio spectrum is a limited resource;
- b) that aircraft, commonly referred to as space planes, are being developed which can fly at altitudes of over 100 km;
- c) that some of the aircraft referred to in *considering b)* use non-orbital trajectories;
- d) that there may be a need to provide air traffic control and navigation to aircraft referred to in *considering b)*;
- e) that the boundary between the Earth's atmosphere and space is usually assumed to be 100 kilometres above the Earth's surface,

*noting*

that existing terrestrial civil aeronautical services are designed to support aircraft flying at altitudes of up to 21 km,

*decides* that the following Questions should be studied

- 1 How will planes be operated including a description of the various phases of flight?
- 2 During which phases of flight described in *decides 1*, will, if at all, need to be supported by air traffic control systems and what sort of systems are expected?
- 3 What radio links will be required to support planes operations and under what radiocommunication service definition will they fall?

*further decides*

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

Category: S2

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\* This Question should be brought to the attention of the International Civil Aviation Organization (ICAO).

## Annex 5

### QUESTION ITU-R 229-4/5\*

#### **Further development of the terrestrial component of IMT**

(2000-2003-2008-2012-2015)

The ITU Radiocommunication Assembly,

*considering*

- a) that by the end of 2014 approximately 7 billion mobile subscriptions roughly corresponding to the total global population are supporting access to global telecommunication networks; however an estimated 2 billion people worldwide live in places which are still out of reach of mobile cellular services;
- b) that mobile data traffic is drastically increasing driven largely by the introduction of new types of advanced devices;
- c) that service functionalities in fixed and mobile networks are increasingly converging;
- d) that the cost of radio technology equipment is continually decreasing, thus making the radio approach an increasingly attractive access option for many applications including broadband communications;
- e) that ever-increasing user demand for mobile radiocommunications requires the continual evolution of systems and development of new mobile broadband systems where required, in order to accommodate higher data rates and provide larger data capacity for applications such as multimedia, video and machine-to-machine services;
- f) that for international operation, economies of scale, and interoperability it is desirable to agree on common system technical, operational, and spectrum-related parameters;
- g) that, after the initial standardization of the terrestrial component of IMT, ongoing enhancements of the IMT specifications have been and will continue to be accommodated over time;
- h) that the implementation of IMT systems is expanding and that these systems will continue to be widely deployed in the near future;
- i) that ITU-R has been endeavouring to facilitate globally harmonized use of the spectrum identified for IMT by developing relevant ITU-R Recommendations;
- j) Question ITU-R 77/5 on consideration of the needs of developing countries in the development and implementation of IMT;
- k) that the ITU Handbooks on “Deployment of IMT-2000 systems” and “Global Trends in IMT” were developed through a collaborative effort among the three ITU Sectors,

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\* This Question should be brought to the attention of the relevant Telecommunication Standardization Sector Study Groups and Radiocommunication Study Group 4.

*recognizing*

- a) that IMT encompasses both a terrestrial component and a satellite component;
- b) the time-scales necessary to develop and agree on the technical, operational and spectrum-related issues associated with the ongoing evolution and further development of future mobile systems;
- c) the needs of the developing countries, taking account of *considering j)* and *k)* above;
- d) that the characteristics of current and future IMT systems, with significantly high data rates, large data traffic capacity and new types of applications, will necessitate the adoption of more spectrally efficient techniques;
- e) that some frequency bands are identified for the use of IMT in the ITU Radio Regulations (RR);
- f) that harmonized use of IMT spectrum is important to bridge the digital divide and bring the benefits of ICTs through IMT systems to all,

*noting*

- a) that Resolution ITU-R 50 addresses the role of the Radiocommunication Sector in the ongoing development of IMT;
- b) that Resolution ITU-R 56 specifies the naming for IMT;
- c) that Resolution ITU-R 57 specifies the principles for the process of the development of IMT-Advanced;
- d) that Resolution ITU-R [IMT.PRINCIPLES] specifies the principles for the process of future development of IMT for 2020 and beyond<sup>1</sup>,

*decides* that the following Questions should be studied

- 1 What are the overall objectives and user needs for the further development of IMT, beyond the work carried out so far by the Radiocommunication Sector on IMT?
- 2 What are the new applications and service requirements associated with further development of IMT?
- 3 What are the technical and operational issues, and spectrum-related issues for the further development of IMT and increasingly efficient use of spectrum?
- 4 What are the technical and operational characteristics needed for the further development of IMT?
- 5 What are the optimal radio-frequency arrangements required to facilitate harmonized use of the spectrum identified for IMT?
- 6 What factors need to be considered in developing a migration strategy to facilitate transition from current IMT technologies to more advanced ones?
- 7 What are the issues concerning the facilitation of global circulation of terminals and other related aspects regarding the continued development and deployment of IMT systems?

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<sup>1</sup> *noting d)* refers to a draft new Resolution ITU-R [IMT.PRINCIPLES] which will be considered by the Radiocommunication Assembly 2015. The inclusion/exclusion of *noting d)* will be editorially addressed by the Secretariat based on the decision of RA-15 on this proposed new Resolution.

8 What are the terrestrial radio interface technologies of IMT and the detailed radio interface specifications which need to be provided by the 2020 timeframe?

9 What should be the objectives for the long-term development of IMT?

*further decides*

1 that the results of the above studies should be included in one or more Report(s) and/or Recommendation(s);

2 that the IMT studies described in *decides* 1 through 7 above should be completed by 2019;

3 that the studies described in *decides* 8 and 9 may extend beyond the 2019 time-frame.

Category: S1

## Annex 6

### QUESTION ITU-R 1-6/5\*

#### **Interference protection ratios and minimum field strengths required in the land mobile services**

(1963-1986-1992-1998-2007-2012-2015)

The ITU Radiocommunication Assembly,

*considering*

- a)* that for certain kinds of mobile service (MS) systems, partial data relating to interference protection ratios and minimum field strengths required, exist in documents of some ITU Conferences and some ITU-R Recommendations (Note 1), and certain ITU-R Reports (Note 2), *et al.*;
- b)* that such documents, however, do not constitute a complete and consistent set of data relating to protection of the desired transmission signal quality from interference of all kinds from services operating in all frequency ranges, particularly with respect to VHF band and UHF band MS systems, nor do they assure proper and consistent use in predicting interference signal levels in MS systems;
- c)* that consistent methods are needed for various types of information transmission to assure consistent use of parameters and their values for determining system interference protection criteria, especially taking into account the constant evolution of MS technologies and their deployment in an ever broader range of the frequency bands;
- d)* that consistent methods are needed as well for calculating interference due to unwanted emissions to assure protection of the desired signal quality in the necessary bandwidth of a MS system;
- e)* that the Radiocommunication Bureau has requested guidance from Radiocommunication Study Groups on the methods to be employed for the calculation of the interference from the mobile-satellite service (MSS), to the MS, and on the criteria to be used;
- f)* that consistent methods are needed as well for calculating interference due to spectrum sharing with other services such as MSS, broadcasting or fixed service to assure protection of the desired signal quality in the necessary bandwidth of a MS system;
- g)* that interference prediction parameters and computational methods are also under study in other Radiocommunication Study Groups, in other telecommunications standards organizations, and in frequency coordination organizations,

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\* This Question should be brought to the attention of Radiocommunication Study Groups 1, 4, 6 and 7.

*decides* that the following Questions should be studied

- 1 What are the signal-to-interference protection ratios which define the threshold of harmful interference for mobile services?
- 2 What are the signal-to-noise ratios and the minimum field strengths required for satisfactory reception of the different classes of emission in the mobile services?
- 3 What are the appropriate fading allowances in the mobile services?
- 4 Which combinations of interfering and victim carrier types are covered by ITU-R texts on interference calculation methods?
- 5 Which combinations of interfering and victim carriers are not currently covered by ITU-R texts describing interference criteria and/or calculation methods, and what criteria and calculation methods are appropriate for such combinations?
- 6 What guidance could be given on circumstances in which the probability of harmful interference between carriers can be considered to be negligible?

*further decides*

- 1 that the above studies should be continued simultaneously and with the same urgency;
- 2 that particular attention should be given to those studies which will assist the further refinement of the technical characteristics of land mobile systems;
- 3 that the above studies should address not only intra-service interference, but also inter-service sharing interference with other services such as the MSS;
- 4 that the results of the above studies should be included in one or more Recommendations, Reports or Handbooks;
- 5 that the above studies should be completed by 2019.

NOTE 1 – See Recommendations, ITU-R M.478, ITU-R M.1825, ITU-R M.2068, ITU-R SM.331, ITU-R SM.337, ITU-R SM.852 and ITU-R SM.1751.

NOTE 2 – See Reports ITU-R M.739, ITU-R M.2116 and ITU-R M.2292.

Category: S2

## Annex 7

### QUESTION ITU-R 48-7/5

#### **Techniques and frequency usage in the amateur service and amateur-satellite service**

(1978-1982-1990-1993-1998-2003-2007-2015)

The ITU Radiocommunication Assembly,

*considering*

- a) that the Radio Regulations define an amateur service and an amateur-satellite service, allocate frequencies to them on an exclusive or shared basis, and provide for the cessation of emissions from amateur satellites;
- b) that the amateur and amateur-satellite services provide benefits of self-training, intercommunication, and technical investigation carried on by amateurs, that is, by duly qualified and authorized persons throughout the world interested in radio techniques solely for the development of personal skills and mutual exchange of information without pecuniary interest;
- c) that, incidental to their basic purposes, the amateur and amateur-satellite services have pioneered new and novel techniques for radio reception and transmission using inexpensive equipment with relatively small antennas;
- d) that frequency dependent factors determine to a large extent the effectiveness of radiocommunications in the amateur and amateur-satellite services;
- e) that the amateur service and the amateur-satellite service continue to make significant contributions to the observation and understanding of propagation phenomena and to techniques which exploit these phenomena;
- f) that amateur and amateur-satellite station operators continue to contribute to the development and demonstration of spectrum conservation techniques throughout the radio-frequency spectrum;
- g) that the amateur and amateur-satellite services provide communications during natural disasters and other catastrophic events when normal communications are temporarily interrupted or inadequate for the needs of human relief operations;
- h) that the amateur and amateur-satellite services contribute to the training of operators and technical personnel, which is of particular benefit to developing countries,

*decides* that the following Questions should be studied

- 1 What are the most desirable technical and operational characteristics of future systems for the amateur and amateur-satellite services?
- 2 What techniques, particularly those which exploit propagation phenomena and conserve spectrum, are being applied or investigated in these services?

- 3 Which of these techniques may be of interest to other services?
- 4 How can the amateur and amateur-satellite services make greater contributions to training of operators and technicians in developing countries?
- 5 What are the appropriate criteria for frequency sharing among stations in the amateur and amateur-satellite services and between the amateur, amateur-satellite and other radiocommunication services?
- 6 What technical and operational characteristics are most suitable for amateur and amateur-satellite systems for communications during natural disasters?
- 7 What modifications, if any, should be considered in the provisions addressing communication, technical characteristics and operator qualifications in the amateur service and amateur-satellite service?

*further decides*

- 1 that the results of the above studies should be included in one or more Recommendations, Reports or Handbooks;
- 2 that the above studies should be completed by 2019.

Category: S2

## Annex 8

### QUESTION ITU-R 209-5/5

#### **Use of the mobile, amateur and the amateur-satellite services in support of disaster radiocommunications**

(1995-1998-2006-2007-2012-2015)

The ITU Radiocommunication Assembly,

*considering*

- a) Resolution 36 (Rev. Guadalajara, 2010) and Resolution 136 (Rev. Busan, 2014);
- b) Resolution 43 (Rev. Dubai, 2014), which instructs the Director BDT, in close collaboration with the Director BR, to continue encouraging and assisting developing countries to implement IMT, to provide assistance to administrations on the use and interpretation of ITU Recommendations relating to IMT;
- c) Resolution **644 (Rev.WRC-12)** on radiocommunication resources for early warning, disaster mitigation and relief operations and Resolution **647 (Rev.WRC-12)** on spectrum management guidelines for emergency and disaster relief radiocommunication;
- d) that the Tampere Convention on the provision of telecommunication resources for disaster mitigation and relief operations by the Intergovernmental Conference on Emergency Telecommunications (ICET-98) came into force on 8 January 2005,

*recognizing*

- a) that when a disaster occurs, the disaster relief agencies are usually the first on the scene using their day-to-day communication systems, but that in most cases, other agencies and organizations may also be involved;
- b) that in times of disasters, if most terrestrial-based networks are destroyed or impaired, other networks in the amateur and amateur-satellite services may be available to provide basic, on-site communications capability;
- c) that important attributes of the amateur services include stations distributed throughout the world which have trained radio operators capable of reconfiguring networks to meet the specific needs of an emergency,

*decides* that the following Questions should be studied

What are the technical, operational and related procedural aspects of mobile, amateur and amateur-satellite services in support and improvements of disaster warning, mitigation and relief operations?

*further decides*

- 1 that the results of the above studies should be included in one or more Recommendations, Reports or Handbooks;
- 2 that the above studies should be completed by 2019;
- 3 that the above studies should be coordinated with the other two Sectors.

Category: S2

## Annex 9

### QUESTION ITU-R 241-3/5

#### **Cognitive radio systems in the mobile service**

(2007-2007-2012-2015)

The ITU Radiocommunication Assembly,

*considering*

- a) that the use of mobile radio systems is growing at a rapid rate globally;
- b) that more efficient use of spectrum is essential to the continued growth of such systems;
- c) that cognitive radio systems (CRSs) may facilitate the more efficient use of spectrum in mobile radio systems;
- d) that cognitive radio systems may offer functional and operational versatility and flexibility in mobile radio systems;
- e) that considerable research and development is being carried out on cognitive radio systems and related radio technologies;
- f) that it is beneficial to identify the technical and operational characteristics of a CRS;
- g) that Report ITU-R SM.2152 contains the ITU-R definition for a CRS;
- h) that ITU-R Reports and/or Recommendations on cognitive radio systems would be complementary to other ITU-R Recommendations on mobile radio systems;
- i) that Reports ITU-R M. 2225, M.2242 and M.2330 contain studies related to CRS,

*noting*

that there are network aspects related to the control of cognitive radio systems,

*recognizing*

- a) that CRSs are a collection of technologies, not a radiocommunication service;
- b) that any radio system implementing CRS technology within any radiocommunication service shall operate in accordance with the provisions of the Radio Regulations applicable for that specific service in the related frequency band,

*decides* that the following Questions should be studied

- 1 What are the closely related radio technologies and their functionalities that may be a part of cognitive radio systems?

- 2 What key technical characteristics, requirements, performance improvements and/or other benefits are associated with the implementation of cognitive radio systems?
- 3 What are the potential applications of cognitive radio systems and their impact on spectrum management?
- 4 How can cognitive radio systems facilitate the efficient use of radio resources?
- 5 What are the operational implications (including privacy and authentication) of cognitive radio systems?
- 6 What are the cognitive capabilities and CRS technologies that could facilitate sharing between the mobile service and -other services, such as broadcasting, mobile-satellite or fixed, as well as passive services, space services (space-to-Earth) and safety services, taking into account the specificity of all these services?
- 7 What are the cognitive capabilities and CRS technologies that could facilitate coexistence of the systems in the mobile service?
- 8 What factors need to be considered for the introduction of CRS technologies in the land mobile service?

*further decides*

- 1 that the results of the above studies should be included in one or more Recommendations, Reports or Handbooks;
- 2 that the above studies should be completed by the year 2019.

Category: S2

## Annex 10

### QUESTION ITU-R 242-2/5

#### **Reference radiation patterns of omnidirectional and sectoral antennas for the fixed and mobile services for use in sharing studies**

(1995-2000-2012-2015)

The ITU Radiocommunication Assembly,

*considering*

- a) that determination of criteria for frequency sharing between point-to-multipoint systems in the fixed service and systems in other services or between systems in the land mobile service and systems in other services requires a knowledge of radiation patterns of omnidirectional and sectoral antennas along all possible interfering paths;
- b) that the use of reference radiation patterns for omnidirectional and sectoral antennas would facilitate interference calculations;
- c) that different reference radiation patterns may be required for the various types of antennas in use,

*decides* that the following Questions should be studied

- 1 What are the measured radiation patterns in the vertical and horizontal planes for both polarizations of typical omnidirectional and sectoral antennas used in point-to-multipoint systems in the fixed service or land mobile systems?
- 2 What reference radiation patterns can be defined for use in sharing studies for the different types of antennas?

*further decides*

- 1 that the results of the above studies should be included in one or more Recommendation(s) or Report(s);
- 2 that the above studies should be completed by 2019.

NOTE – See Recommendation ITU-R [F.1336](#).

Category: S2

## Annex 11

### List of suppressed ITU-R Questions

Question ITU-R	Title
202-3/5	Unwanted emissions of primary radar systems
225-1/5	Interference to the aeronautical and maritime mobile services in the HF bands by unauthorized stations
231/5	Operation of wideband aeronautical telemetry in bands above 3 GHz
240/5	Technical and operational characteristics and spectrum requirements of high-frequency surface wave radar systems operating in the frequency range 3 to 50 MHz
249/5	Technical characteristics and operational requirements of wireless avionics intra-communications (WAIC)
251/5	Technical and operational aspects of passive and active base station antennas for IMT systems

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