



## The Secretary-General

Geneva, 28 April 2020

Mr Luis Jorge ROMERO,  
Chairman of the Project Co-ordination Group  
(PCG)  
The 3rd Generation Partnership Project (3GPP)  
3GPP Mobile Competence Centre  
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Dear Sir,

The World Radiocommunication Conference, Sharm el-Sheikh, 2019 (WRC-19) adopted or revised a number of Resolutions which it considered to be of interest to your organization and has instructed me to bring these Resolutions to your attention.

In pursuance of the above instruction, I have the honor to forward herewith, for information and appropriate action, the said Resolutions. The same documents in the six official languages of the ITU are also available for download at <http://www.itu.int/go/wrc-19/res>.

It would be greatly appreciated if you would keep me informed of your organization's action on any of these matters, so that I may advise the ITU administrations accordingly.

Yours faithfully,

A handwritten signature in blue ink, appearing to be 'Houlin Zhao', is placed above the printed name.

Houlin Zhao

**Annexes:** Resolution **240 (WRC-19)**  
Resolution **241 (WRC-19)**  
Resolution **242 (WRC-19)**  
Resolution **243 (WRC-19)**

Resolution **811 (WRC-19)**  
Resolution **812 (WRC-19)**  
Recommendation **208 (WRC-19)**

**Spectrum harmonization for railway radiocommunication systems between train and trackside within the existing mobile-service allocations**

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

*considering*

- a) that railway transportation contributes to global economic and social development, especially for developing countries;
- b) that the term “railway radiocommunication systems between train and trackside” (RSTT) refers to radiocommunication systems providing improved railway traffic control, passenger safety and improved security for train operations;
- c) that the main categories of RSTT applications are train radio, train positioning information, train remote and train surveillance;
- d) that spectrum harmonization of the train radio application of RSTT may have priority among the four categories of RSTT applications, because the train radio application provides for train dispatching, train control and other important railway services which are used to ensure the safety of passengers and train operations and require high reliability and high quality of services;
- e) that there may be a need to integrate different technologies across multiple bands in order to facilitate various functions, for instance dispatching commands, operating control and data transmission, into railway train and trackside systems to also meet the needs of a high-speed railway environment;
- f) that the technologies for RSTT are evolving, and international or regional organizations, such as the 3rd Generation Partnership Project (3GPP), the International Union of Railways (UIC), the European Telecommunications Standards Institute (ETSI), the European Union Agency for Railways (ERA), etc., are developing specifications for technologies and new functions to evolve RSTT;
- g) that the implementation of evolving RSTT needs to take account of the development of the railway industry;
- h) that some administrations wish to facilitate RSTT interoperability, in particular for cross-border operations, to ensure spectrum resources are used effectively and to minimize the risk of interference;
- i) that deployment of RSTT requires significant long-term investment and a stable radio regulatory environment;
- j) that international standards and harmonized spectrum could facilitate deployment of RSTT and provide economies of scale for the railway industry;
- k) that the harmonization of frequency bands for RSTT does not preclude the use of these frequency bands by any other application of services to which they are allocated,

*recognizing*

- a) that Report ITU-R M.2418 provides the generic architecture, main applications, current technologies and generic operating scenarios of RSTT;

- b) that Report ITU-R M.2442 provides detailed technical and operational characteristics of RSTT and also provides spectrum usage of current and planned RSTT in some countries;
- c) that devices used for the train positioning information application of RSTT may be based on short-range devices, using some frequency bands contained in the most recent version of Recommendation ITU-R SM.1896;
- d) that, as indicated in Report ITU-R M.2442, most of the current radiocommunication systems for train radio and train remote applications are widely deployed in the frequency bands below 1 GHz, and higher frequency bands such as millimetric bands are used for train radio and train surveillance applications of RSTT in some countries;
- e) that the ITU Radiocommunication Sector (ITU-R) is developing an ITU-R Recommendation to facilitate the spectrum harmonization of current and evolving RSTT within the existing mobile-service allocations,

*noting*

- a) that Report ITU-R M.2442 indicates that several particular frequency bands are in common use for train radio applications of RSTT by some administrations;
- b) that administrations have flexibility to determine how much spectrum to make available for RSTT as well as the conditions for usage at the national level in order to meet their particular national and/or regional requirements,

*resolves*

to encourage administrations, when planning for their RSTT, to consider the study results as per *invites the ITU Radiocommunication Sector* 1, as well as other relevant ITU-R Recommendations/Reports, with a view to facilitating spectrum harmonization for RSTT, in particular for train radio applications,

*invites the ITU Radiocommunication Sector*

- 1 to continue development of the ITU-R Recommendation referred in *recognizing e)* addressing spectrum harmonization for RSTT in a timely manner;
- 2 to further develop and update ITU-R Recommendations/Reports concerning the technical and operational implementation of RSTT, as appropriate,

*instructs the Director of the Radiocommunication Bureau*

to support administrations in their work towards the harmonization of spectrum for RSTT pursuant to *resolves* above,

*invites administrations*

to encourage railway agencies and organizations to utilize relevant ITU-R publications in implementing technologies and systems supporting RSTT,

*invites Member States, Sector Members, Associates and Academia*

to participate actively in the study by submitting contributions to ITU-R,

*instructs the Secretary-General*

to bring this Resolution to the attention of UIC, 3GPP and other relevant international and regional organizations.

**ADD**

**RESOLUTION 241 (WRC-19)**

**Use of the frequency band 66-71 GHz for International Mobile  
Telecommunications and coexistence with  
other applications of the mobile service**

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

*considering*

- a)* that International Mobile Telecommunications (IMT), including IMT-2000, IMT-Advanced and IMT-2020, and other wireless access systems are intended to provide telecommunication services on a worldwide scale regardless of location and type of network or terminal;
- b)* that the evolution of IMT is being studied within the ITU Radiocommunication Sector (ITU-R);
- c)* that harmonized worldwide frequency bands and harmonized frequency arrangements are highly desirable in order to achieve global roaming and the benefits of economies of scale;
- d)* that adequate and timely availability of spectrum for IMT and supporting regulatory provisions are essential to realize the objectives in Recommendation ITU-R M.2083;
- e)* that IMT systems are envisaged to provide increased peak data rates and capacity that may require a larger bandwidth;
- f)* that there is a need to protect existing services and to allow for their continued development,

*noting*

- a)* Recommendation ITU-R M.2083, which provides the “IMT Vision – Framework and overall objectives of the future development of IMT for 2020 and beyond”;
- b)* Recommendation ITU-R M.2003, on multiple gigabit wireless systems in frequencies around 60 GHz;
- c)* Report ITU-R M.2227, on the Use of multiple gigabit wireless systems in frequencies around 60 GHz,

*recognizing*

Resolutions 176 (Rev. Dubai, 2018) and 203 (Rev. Dubai, 2018) of the Plenipotentiary Conference,

*resolves*

- 1 that administrations wishing to implement IMT make available the frequency band 66-71 GHz identified in No. **5.559AA** for use by the terrestrial component of IMT;
- 2 that administrations wishing to implement IMT in the frequency band 66-71 GHz, identified for IMT under the provisions in No. **5.559AA**, which also wish to implement other applications of the mobile service, including other wireless access systems in the same frequency band, consider coexistence between IMT and these applications,

*invites the ITU Radiocommunication Sector*

- 1 to develop harmonized frequency arrangements for the implementation of the terrestrial component of IMT in the frequency band 66-71 GHz;
- 2 to develop ITU-R Recommendations and/or Reports, as appropriate, to assist administrations in ensuring the efficient use of the frequency band through coexistence mechanisms between IMT and other applications of the mobile service, including other wireless access systems, as well as between the mobile service and other services;
- 3 to regularly review, as appropriate, the impact of evolving technical and operational characteristics of IMT systems (including base-station density) and those of systems of space services on sharing and compatibility, and to take into account the results of these reviews in the development and/or revision of ITU-R Recommendations/Reports addressing, *inter alia*, if necessary, applicable measures to mitigate the risk of interference into space receivers,

*instructs the Director of the Radiocommunication Bureau*

to bring this Resolution to the attention of relevant international organizations.

## RESOLUTION 242 (WRC-19)

**Terrestrial component of International Mobile Telecommunications in the frequency band 24.25-27.5 GHz**

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

*considering*

- a)* that International Mobile Telecommunications (IMT), including IMT-2000, IMT-Advanced and IMT-2020, is the ITU vision of global mobile access, and is intended to provide telecommunication services on a worldwide scale, regardless of location and type of network or terminal;
- b)* that the evolution of IMT is being studied within the ITU Radiocommunication Sector (ITU-R);
- c)* that harmonized worldwide frequency bands for IMT are desirable in order to achieve global roaming and the benefits of economies of scale;
- d)* that IMT systems are now being evolved to support diverse usage scenarios such as enhanced mobile broadband, massive machine-type communications and ultra-reliable and low-latency communications;
- e)* that ultra-low latency and very high bit-rate applications of IMT will require larger contiguous blocks of spectrum than those available in frequency bands that are currently identified for use by administrations wishing to implement IMT;
- f)* that the properties of higher frequency bands, such as shorter wavelength, would better enable the use of advanced antenna systems, including multiple input, multiple output (MIMO) and beam-forming techniques, in supporting enhanced broadband;
- g)* that identification of frequency bands allocated to the mobile service for IMT may change the sharing situation regarding applications of services to which the frequency band is already allocated, and may require regulatory actions;
- h)* that there is a need to protect existing services and to allow for their continued development;
- i)* that ITU-R has studied, in preparation for WRC-19, sharing and compatibility with services allocated in the frequency band 24.25-27.5 GHz and its adjacent band, based on characteristics available at that time, and results may change if these characteristics change;
- j)* that it is assumed that a very limited number of IMT base stations will be communicating with a positive elevation angle towards IMT indoor mobile stations;
- k)* that the allocations of frequency bands to the Earth exploration-satellite service (EESS) (passive) are defined solely by the fundamental properties of the Earth and its atmosphere, and related measurements are beneficial and used globally and extensively in meteorology, climatology and other scientific purposes for the protection of human life and natural resources; and although EESS (passive) satellites and sensors are operated by few countries, they benefit of the whole international community and are hence to be protected on a worldwide basis;
- l)* that sharing studies were conducted considering applications in the land mobile service,

*noting*

Recommendation ITU-R M.2083, which provides the “IMT Vision – Framework and overall objectives of the future development of IMT for 2020 and beyond”,

*recognizing*

- a) that the identification of a frequency band for IMT does not establish priority in the Radio Regulations and does not preclude the use of the frequency band by any application of the services to which it is allocated;
- b) Resolutions 176 (Rev. Dubai, 2018) and 203 (Rev. Dubai, 2018) of the Plenipotentiary Conference;
- c) that Resolution **750 (Rev.WRC-19)** establishes limits on unwanted emissions in the frequency band 23.6-24 GHz from IMT base stations and IMT mobile stations within the frequency band 24.25-27.5 GHz;
- d) that the spurious emission limits of Recommendation ITU-R SM.329 Category B (–60 dB(W/MHz)) are sufficient to protect the EESS (passive) in the frequency bands 50.2-50.4 GHz and 52.6-54.25 GHz from the second harmonic of IMT base station emissions in the frequency band 24.25-27.5 GHz;
- e) that ITU-R has conducted sharing studies between IMT and the inter-satellite service (ISS)/fixed-satellite service (FSS) (Earth-to-space) in the frequency band 24.25-27.5 GHz based on a number of baseline assumptions, (e.g. equivalent isotropically radiated power (e.i.r.p.) of 18 dB(W/200 MHz), base station densities of 1 200 per 10 000 km<sup>2</sup> and other deployment scenarios), as well as sensitivity analysis for some of them, and these baseline assumptions, as well as other assumptions, influence the sharing study results;
- f) that the frequency bands immediately below the passive frequency band 23.6-24 GHz are not intended to be used for high-density mobile applications,

*resolves*

- 1 that administrations wishing to implement IMT consider use of the frequency band 24.25-27.5 GHz identified for IMT in No. **5.532AB**, and the benefits of harmonized utilization of the spectrum for the terrestrial component of IMT, taking into account the latest relevant ITU-R Recommendations;
- 2 that administrations shall apply the following conditions for the frequency band 24.25-27.5 GHz:
  - 2.1 take practical measures to ensure the transmitting antennas of outdoor base stations are normally pointing below the horizon, when deploying IMT base stations within the frequency band 24.25-27.5 GHz; the mechanical pointing needs to be at or below the horizon;
  - 2.2 as far as practicable, sites for IMT base stations within the frequency band 24.45-27.5 GHz employing values of e.i.r.p. per beam exceeding 30 dB(W/200 MHz) should be selected so that the direction of maximum radiation of any antenna will be separated from the geostationary-satellite orbit, within line-of-sight of the IMT base station, by  $\pm 7.5$  degrees;
- 3 that protection of EESS/space research service (SRS) earth stations in the frequency band 25.5-27 GHz and radio astronomy service (RAS) stations in the frequency band 23.6-24 GHz and coexistence between FSS earth stations in the frequency bands 24.65-25.25 GHz and 27-27.5 GHz



and IMT stations should be facilitated through bilateral agreements for cross-border coordination as necessary;

4 that the operation of IMT within the frequency band 24.25-27.5 GHz shall protect existing and future EESS (passive) systems in the frequency band 23.6-24 GHz;

5 that IMT stations within the frequency range 24.25-27.5 GHz are used for applications of the land mobile service,

*encourages administrations*

1 to ensure that provisions for the implementation of IMT allow for the continued use of EESS, SRS and FSS earth stations and their future development;

2 to keep the antenna pattern of IMT base stations within the limits of the approximation envelope according to Recommendation ITU-R M.2101;

3 to apply the spurious emission limits of Recommendation ITU-R SM.329 Category B for the frequency bands 50.2-50.4 GHz and 52.6-54.25 GHz when making the frequency band 24.25-27.5 GHz available for IMT;

4 that for the future development of EESS (passive) in the frequency band 23.6-24 GHz, administrations should consider additional mitigation techniques (e.g. guardbands) beyond the limits specified in Resolution **750 (Rev.WRC-19)**, as appropriate,

*invites the ITU Radiocommunication Sector*

1 to develop harmonized frequency arrangements to facilitate IMT deployment in the frequency band 24.25-27.5 GHz, taking into account the results of sharing and compatibility studies conducted in preparation for WRC-19;

2 to develop an ITU-R Recommendation on methodologies for calculating coordination zones around EESS/SRS earth stations in order to avoid harmful interference from IMT systems in the frequency band 25.5-27 GHz;

3 to develop ITU-R Recommendation(s) to assist administrations to mitigate interference from FSS earth stations into IMT stations operating in the frequency bands 24.65-25.25 GHz and 27-27.5 GHz;

4 to update existing ITU-R Recommendations or develop a new ITU-R Recommendation, as appropriate, to provide information and assistance to the concerned administrations on possible coordination and protection measures for the RAS in the frequency band 23.6-24 GHz from IMT deployment;

5 to regularly review, as appropriate, the impact of evolving technical and operational characteristics of IMT systems (including base-station density) and those of systems of space services on sharing and compatibility, and to take into account the results of these reviews in the development and/or revision of ITU-R Recommendations/Reports addressing, *inter alia*, if necessary, applicable measures to mitigate the risk of interference into space receivers,

*instructs the Director of the Radiocommunication Bureau*

to bring this Resolution to the attention of relevant international organizations.

## RESOLUTION 243 (WRC-19)

**Terrestrial component of International Mobile Telecommunications in the frequency bands 37-43.5 GHz and 47.2-48.2 GHz**

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

*considering*

- a) that International Mobile Telecommunications (IMT), including IMT-2000, IMT-Advanced and IMT-2020, is intended to provide telecommunication services on a worldwide scale, regardless of location and type of network or terminal;
- b) that adequate and timely availability of spectrum and supporting regulatory provisions are essential to realize the objectives in Recommendation ITU-R M.2083;
- c) that there is a need to continually take advantage of technological developments in order to increase the efficient use of spectrum and facilitate spectrum access;
- d) that IMT systems are now being evolved to provide diverse usage scenarios and applications such as enhanced mobile broadband, massive machine-type communications and ultra-reliable and low-latency communications;
- e) that ultra-low latency and very high bit-rate applications of IMT will require larger contiguous blocks of spectrum than those available in frequency bands that are currently identified for use by administrations wishing to implement IMT;
- f) that the properties of higher frequency bands, such as shorter wavelength, would better enable the use of advanced antenna systems, including multiple-input and multiple-output (MIMO) and beam-forming techniques, in supporting enhanced broadband;
- g) that harmonized worldwide frequency bands for IMT are desirable in order to achieve global roaming and the benefits of economies of scale;
- h) that the ITU Radiocommunication Sector (ITU-R) has studied, in preparation for WRC-19, sharing and compatibility with services allocated in the frequency ranges 37-43.5 GHz and 47.2-48.2 GHz and their adjacent frequency bands, based on the characteristics available at that time, and the results may change if these characteristics change;
- i) that identification of frequency bands allocated to the mobile service for IMT may change the sharing situation regarding applications of services to which the frequency band is already allocated, and may require regulatory actions;
- j) that there is a need to protect existing services and to allow for their continued development;
- k) that it is assumed that a very limited number of IMT base stations will be communicating with a positive elevation angle towards IMT indoor mobile stations;
- l) that the use of this frequency band by the mobile service for IMT is intended for land mobile service use and sharing studies were conducted based on that assumption,

*noting*

- a) Recommendation ITU-R M.2083, which provides the “IMT Vision – Framework and overall objectives of the future development of IMT for 2020 and beyond”;

- b) that Report ITU-R M.2320 addresses future technology trends of terrestrial IMT systems;
- c) that Report ITU-R M.2370 addresses trends impacting future IMT traffic growth beyond the year 2020 and estimates global traffic demand for the period 2020 to 2030;
- d) that Resolution **143 (Rev.WRC-19)** establishes the guidelines for the implementation of high-density applications in the fixed-satellite service (HDFS) in frequency bands identified for these applications,

*recognizing*

- a) that timely availability of wide and contiguous blocks of spectrum is important to support the development of IMT;
- b) Resolutions 176 (Rev. Dubai, 2018) and 203 (Rev. Dubai, 2018) of the Plenipotentiary Conference;
- c) the identification of HDFS in the space-to-Earth direction in the frequency bands 39.5-40 GHz in Region 1, 40-40.5 GHz in all Regions, 40.5-42 GHz in Region 2 and 47.5-47.9 GHz in Region 1 (see No. **5.516B**);
- d) that No. **5.149** applies for the purpose of protecting the radio astronomy service (RAS) in the frequency band 42.5-43.5 GHz, which is allocated on a primary basis;
- e) that the frequency band 47.2-48.2 GHz is allocated to the fixed, mobile and fixed-satellite services, including planned non-geostationary-satellite (non-GSO) uplinks,

*resolves*

1 that administrations wishing to implement IMT consider use of the frequency band 37-43.5 GHz, or portions thereof, and the frequency band 47.2-48.2 GHz, identified for IMT in No. **5.550B** and No. **5.553B**, and the benefits of harmonized utilization of the spectrum for the terrestrial component of IMT taking into account the latest relevant ITU-R Recommendations;

2 that, in order to ensure coexistence between IMT in the frequency bands 37-43.5 GHz and 47.2-48.2 GHz as identified by this conference in Article **5** and other services to which the frequency band is allocated, including the protection of these other services, administrations shall apply the following condition(s):

2.1 in order to protect the Earth exploration satellite service (EESS) (passive) in the frequency band 36-37 GHz, the following unwanted emissions of IMT stations operating in the frequency band 37-40.5 GHz apply as specified in Table 1 below:

TABLE 1

Frequency band for the EESS (passive)	Frequency band for IMT stations	Unwanted emission mean power for IMT stations <sup>1</sup>	Recommended limits for IMT stations <sup>1</sup>
36-37 GHz	37-40.5 GHz	–43 dB(W/MHz) and –23 dB(W/GHz) within the frequency band 36-37 GHz	–30 dB(W/GHz)

<sup>1</sup> The unwanted emission power level is considered in terms of total radiated power (TRP). The TRP is to be understood here as the integral of the power transmitted from all antenna elements in different directions over the entire radiation sphere.

2.2 protection of space research service (SRS) earth stations in the frequency band 37-38 GHz and RAS stations in the frequency band 42.5-43.5 GHz from IMT stations should be facilitated through bilateral agreements for cross-border coordination as necessary;

2.3 protection of and coexistence with fixed-satellite service (FSS) earth stations within the frequency ranges 37.5-43.5 GHz and 47.2-48.2 GHz should be facilitated through bilateral agreements for cross-border coordination as necessary;

2.4 take practical measures to ensure the transmitting antennas of outdoor base stations are normally pointing below the horizon, when deploying IMT base stations within the frequency bands 42.5-43.5 GHz and 47.2-48.2 GHz; the mechanical pointing needs to be at or below the horizon;

2.5 as far as practicable, sites for IMT base stations in the frequency bands 42.5-43.5 GHz and 47.2-48.2 GHz employing values of equivalent isotropically radiated power (e.i.r.p.) per beam exceeding 30 dB(W/200 MHz) should be selected so that the direction of maximum radiation of any antenna will be separated from the geostationary-satellite orbit, within line-of-sight of the IMT base station, by  $\pm 7.5$  degrees;

3 that IMT stations within the frequency ranges 37-43.5 GHz and 47.2-48.2 GHz are used for applications of the land mobile service,

*invites administrations*

to ensure that, when considering the spectrum to be used for IMT, due attention is paid to the need for spectrum for ubiquitous earth stations at unspecified points, as well as those used for gateways, taking into account spectrum identified in the frequency bands 39.5-40 GHz in Region 1, 40-40.5 GHz in all Regions, 40.5-42 GHz in Region 2 and 47.5-47.9 GHz in Region 1 for the HDFSS as per No. **5.516B**,

*encourages administrations*

1 to ensure that provisions for the implementation of IMT allow for the continued development of EESS, SRS, FSS and broadcasting-satellite service (BSS) earth stations and RAS stations and their future development;

2 to keep the antenna pattern of IMT base stations within the limits of the approximation envelope according to Recommendation ITU-R M.2101,

*encourages administrations of Region 1*

to consider implementing IMT in the frequency band 40.5-43.5 GHz in order to better accommodate the needs of other services below 40.5 GHz, taking into account protection of the FSS within the frequency band 37.5-40.5 GHz in Region 1,

*invites the ITU Radiocommunication Sector*

1 to develop harmonized frequency arrangements to facilitate IMT deployment in the frequency bands 37-43.5 GHz and 47.2-48.2 GHz, taking into account the results of sharing and compatibility studies conducted in preparation for WRC-19;

2 to continue providing guidance to ensure that IMT can meet the telecommunication needs of the developing countries;

3 to develop an ITU-R Recommendation on methodologies for calculating coordination zones around SRS earth stations in order to avoid harmful interference from IMT systems in the frequency band 37-38 GHz;

- 4 to develop ITU-R Reports and Recommendations, as appropriate, to assist administrations in ensuring coexistence between IMT and BSS and FSS, including HDFSS as per No. **5.516B**, within the frequency ranges 37-43.5 GHz and 47.2-48.2 GHz, as appropriate;
- 5 to develop a new ITU-R Recommendation, as appropriate, to provide information and assistance to the concerned administrations on possible coordination and protection measures for the RAS in the frequency band 42.5-43.5 GHz from IMT deployment;
- 6 to regularly review, as appropriate, the impact of evolving technical and operational characteristics of IMT systems (including base-station density) and those of systems of space services on sharing and compatibility, and to take into account the results of these reviews in the development and/or revision of ITU-R Recommendations/Reports addressing, *inter alia*, if necessary, applicable measures to mitigate the risk of interference into space receivers,

*instructs the Director of the Radiocommunication Bureau*

to bring this Resolution to the attention of relevant international organizations.

**ADD**

## RESOLUTION 811 (WRC-19)

### **Agenda for the 2023 world radiocommunication conference**

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

*considering*

- a) that, in accordance with No. 118 of the ITU Convention, the general scope of the agenda for a world radiocommunication conference (WRC) should be established four to six years in advance and that a final agenda shall be established by the ITU Council two years before the conference;
- b) Article 13 of the ITU Constitution relating to the competence and scheduling of WRCs and Article 7 of the Convention relating to their agendas;
- c) the relevant resolutions and recommendations of previous world administrative radio conferences (WARCs) and WRCs,

*recognizing*

- a) that this conference has identified a number of urgent issues requiring further examination by WRC-23;
- b) that, in preparing this agenda, some items proposed by administrations could not be included and have had to be deferred to future conference agendas,

*resolves*

to recommend to the Council that a WRC be held in 2023 for a maximum period of four weeks, with the following agenda:

1 on the basis of proposals from administrations, taking account of the results of WRC-19 and the Report of the Conference Preparatory Meeting, and with due regard to the requirements of existing and future services in the frequency bands under consideration, to consider and take appropriate action in respect of the following items:

1.1 to consider, based on the results of ITU-R studies, possible measures to address, in the frequency band 4 800-4 990 MHz, protection of stations of the aeronautical and maritime mobile services located in international airspace and waters from other stations located within national territories, and to review the power flux-density criteria in No. **5.441B** in accordance with Resolution **223 (Rev.WRC-19)**;

1.2 to consider identification of the frequency bands 3 300-3 400 MHz, 3 600-3 800 MHz, 6 425-7 025 MHz, 7 025-7 125 MHz and 10.0-10.5 GHz for International Mobile Telecommunications (IMT), including possible additional allocations to the mobile service on a primary basis, in accordance with Resolution **245 (WRC-19)**;

1.3 to consider primary allocation of the frequency band 3 600-3 800 MHz to the mobile service in Region 1 and take appropriate regulatory actions, in accordance with **Resolution 246 (WRC-19)**;

1.4 to consider, in accordance with Resolution **247 (WRC-19)**, the use of high-altitude platform stations as IMT base stations (HIBS) in the mobile service in certain frequency bands below 2.7 GHz already identified for IMT, on a global or regional level;

- 1.5 to review the spectrum use and spectrum needs of existing services in the frequency band 470-960 MHz in Region 1 and consider possible regulatory actions in the frequency band 470-694 MHz in Region 1 on the basis of the review, in accordance with Resolution **235 (WRC-15)**;
- 1.6 to consider, in accordance with Resolution **772 (WRC-19)**, regulatory provisions to facilitate radiocommunications for sub-orbital vehicles;
- 1.7 to consider a new aeronautical mobile-satellite (R) service allocation in accordance with Resolution **428 (WRC-19)** for both the Earth-to-space and space-to-Earth directions of aeronautical VHF communications in all or part of the frequency band 117.975-137 MHz, while preventing any undue constraints on existing VHF systems operating in the aeronautical mobile (R) service, in the aeronautical radionavigation service, and in adjacent frequency bands;
- 1.8 to consider, on the basis of ITU-R studies in accordance with Resolution **171 (WRC-19)**, appropriate regulatory actions, with a view to reviewing and, if necessary, revising Resolution **155 (Rev.WRC-19)** and No. **5.484B** to accommodate the use of fixed-satellite service networks by control and non-payload communications of unmanned aircraft systems;
- 1.9 to review Appendix **27** of the Radio Regulations and consider appropriate regulatory actions and updates based on ITU-R studies, in order to accommodate digital technologies for commercial aviation safety-of-life applications in existing HF bands allocated to the aeronautical mobile (R) service and ensure coexistence of current HF systems alongside modernized HF systems, in accordance with Resolution **429 (WRC-19)**;
- 1.10 to conduct studies on spectrum needs, coexistence with radiocommunication services and regulatory measures for possible new allocations for the aeronautical mobile service for the use of non-safety aeronautical mobile applications, in accordance with Resolution **430 (WRC-19)**;
- 1.11 to consider possible regulatory actions to support the modernization of the Global Maritime Distress and Safety System (GMDSS) and the implementation of e-navigation, in accordance with Resolution **361 (Rev.WRC-19)**;
- 1.12 to conduct, and complete in time for WRC-23, studies for a possible new secondary allocation to the Earth exploration-satellite service (active) for spaceborne radar sounders within the range of frequencies around 45 MHz, taking into account the protection of incumbent services, including in adjacent bands, in accordance with Resolution **656 (Rev.WRC-19)**;
- 1.13 to consider a possible upgrade of the allocation of the frequency band 14.8-15.35 GHz to the space research service, in accordance with Resolution **661 (WRC-19)**;
- 1.14 to review and consider possible adjustments of the existing frequency allocations or possible new primary frequency allocations to the Earth exploration-satellite service (passive) in the frequency range 231.5-252 GHz, to ensure alignment with more up-to-date remote-sensing observation requirements, in accordance with Resolution **662 (WRC-19)**;
- 1.15 to harmonize the use of the frequency band 12.75-13.25 GHz (Earth-to-space) by earth stations on aircraft and vessels communicating with geostationary space stations in the fixed-satellite service globally, in accordance with Resolution **172 (WRC-19)**;
- 1.16 to study and develop technical, operational and regulatory measures, as appropriate, to facilitate the use of the frequency bands 17.7-18.6 GHz, 18.8-19.3 GHz and 19.7-20.2 GHz (space-to-Earth) and 27.5-29.1 GHz and 29.5-30 GHz (Earth-to-space) by non-geostationary fixed-satellite service earth stations in motion, while ensuring due protection of existing services in those frequency bands, in accordance with Resolution **173 (WRC-19)**;

- 1.17 to determine and carry out, on the basis of ITU-R studies in accordance with Resolution **773 (WRC-19)**, the appropriate regulatory actions for the provision of inter-satellite links in specific frequency bands, or portions thereof, by adding an inter-satellite service allocation where appropriate;
- 1.18 to consider studies relating to spectrum needs and potential new allocations to the mobile-satellite service for future development of narrowband mobile-satellite systems, in accordance with Resolution **248 (WRC-19)**;
- 1.19 to consider a new primary allocation to the fixed-satellite service in the space-to-Earth direction in the frequency band 17.3-17.7 GHz in Region 2, while protecting existing primary services in the band, in accordance with Resolution **174 (WRC-19)**;
- 2 to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with *further resolves* of Resolution **27 (Rev.WRC-19)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with the principles contained in *resolves* of that Resolution;
- 3 to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the conference;
- 4 in accordance with Resolution **95 (Rev.WRC-19)**, to review the Resolutions and Recommendations of previous conferences with a view to their possible revision, replacement or abrogation;
- 5 to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the ITU Convention;
- 6 to identify those items requiring urgent action by the radiocommunication study groups in preparation for the next world radiocommunication conference;
- 7 to consider possible changes, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, on advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution **86 (Rev.WRC-07)**, in order to facilitate the rational, efficient and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;
- 8 to consider and take appropriate action on requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, taking into account Resolution **26 (Rev.WRC-19)**;
- 9 to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the ITU Convention;
- 9.1 on the activities of the ITU Radiocommunication Sector since WRC-19:
- In accordance with Resolution **657 (Rev.WRC-19)**, review the results of studies relating to the technical and operational characteristics, spectrum requirements and appropriate radio service designations for space weather sensors with a view to describing appropriate recognition and protection in the Radio Regulations without placing additional constraints on incumbent services;
  - Review the amateur service and the amateur-satellite service allocations in the frequency band 1 240-1 300 MHz to determine if additional measures are required to ensure protection of the radionavigation-satellite service (space-to-Earth) operating in the same band in accordance with Resolution **774 (WRC-19)**;



– Study the use of International Mobile Telecommunication systems for fixed wireless broadband in the frequency bands allocated to the fixed service on a primary basis, in accordance with Resolution **175 (WRC-19)**;

9.2 on any difficulties or inconsistencies encountered in the application of the Radio Regulations;<sup>1</sup> and

9.3 on action in response to Resolution **80 (Rev.WRC-07)**;

10 to recommend to the ITU Council items for inclusion in the agenda for the next world radiocommunication conference, and items for the preliminary agenda of future conferences, in accordance with Article 7 of the ITU Convention and Resolution **804 (Rev.WRC-19)**,

*invites the ITU Council*

to finalize the agenda and arrange for the convening of WRC-23, and to initiate as soon as possible the necessary consultations with Member States,

*instructs the Director of the Radiocommunication Bureau*

1 to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting (CPM) and to prepare a report to WRC-23;

2 to submit a draft report on any difficulties or inconsistencies encountered in the application of the Radio Regulations referred in agenda item 9.2 to the second session of the CPM and to submit the final report at least five months before the next WRC,

*instructs the Secretary-General*

to communicate this Resolution to international and regional organizations concerned.

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<sup>1</sup> This agenda sub-item is strictly limited to the Report of the Director on any difficulties or inconsistencies encountered in the application of the Radio Regulations and the comments from administrations. Administrations are invited to inform the Director of the Radiocommunication Bureau of any difficulties or inconsistencies encountered in the Radio Regulations.

## RESOLUTION 812 (WRC-19)

**Preliminary agenda for the 2027 World Radiocommunication Conference\***

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

*considering*

- a) that, in accordance with No. 118 of the ITU Convention, the general scope of the agenda for WRC-27 should be established four to six years in advance;
- b) Article 13 of the ITU Constitution relating to the competence and scheduling of world radiocommunication conferences (WRCs) and Article 7 of the Convention relating to their agendas;
- c) the relevant resolutions and recommendations of previous world administrative radio conferences (WARCs) and WRCs,

*resolves to give the view*

that the following items should be included in the preliminary agenda for WRC-27:

- 1 to take appropriate action in respect of those urgent issues that were specifically requested by WRC-23;
- 2 on the basis of proposals from administrations and the Report of the Conference Preparatory Meeting, and taking account of the results of WRC-23, to consider and take appropriate action in respect of the following items:
  - 2.1 to consider, in accordance with Resolution **663 (WRC-19)**, additional spectrum allocations to the radiolocation service on a co-primary basis in the frequency band 231.5-275 GHz and an identification for radiolocation applications in frequency bands in the frequency range 275-700 GHz for millimetre and sub-millimetre wave imaging systems;
  - 2.2 to study and develop technical, operational and regulatory measures, as appropriate, to facilitate the use of the frequency bands 37.5-39.5 GHz (space-to-Earth), 40.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) by aeronautical and maritime earth stations in motion communicating with geostationary space stations in the fixed-satellite service, in accordance with Resolution **176 (WRC-19)**;
  - 2.3 to consider the allocation of all or part of the frequency band [43.5-45.5 GHz] to the fixed-satellite service, in accordance with Resolution **177 (WRC-19)**;
  - 2.4 the introduction of power flux-density (pfd) and equivalent isotropically radiated power (e.i.r.p.) limits in Article **21** for the frequency bands 71-76 GHz and 81-86 GHz in accordance with Resolution **775 (WRC-19)**;
  - 2.5 the conditions for the use of the frequency bands 71-76 GHz and 81-86 GHz by stations in the satellite services to ensure compatibility with passive services in accordance with Resolution **776 (WRC-19)**;

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\* The appearance of square brackets around certain frequency bands in this Resolution is understood to mean that WRC-23 will consider and review the inclusion of these frequency bands with square brackets and decide, as appropriate.

- 2.6 to consider regulatory provisions for appropriate recognition of space weather sensors and their protection in the Radio Regulations, taking into account the results of ITU Radiocommunication Sector studies reported to WRC-23 under agenda item 9.1 and its corresponding Resolution **657 (Rev.WRC-19)**;
- 2.7 to consider the development of regulatory provisions for non-geostationary fixed-satellite system feeder links in the frequency bands 71-76 GHz (space-to-Earth and proposed new Earth-to-space) and 81-86 GHz (Earth-to-space), in accordance with Resolution **178 (WRC-19)**;
- 2.8 to study the technical and operational matters, and regulatory provisions, for space-to-space links in the frequency bands [1 525-1 544 MHz], [1 545-1 559 MHz], [1 610-1 645.5 MHz], [1 646.5-1 660.5 MHz] and [2 483.5-2 500 MHz] among non-geostationary and geostationary satellites operating in the mobile-satellite service, in accordance with Resolution **249 (WRC-19)**;
- 2.9 to consider possible additional spectrum allocations to the mobile service in the frequency band 1 300-1 350 MHz to facilitate the future development of mobile-service applications, in accordance with Resolution **250 (WRC-19)**;
- 2.10 to consider improving the utilization of the VHF maritime frequencies in Appendix **18**, in accordance with Resolution **363 (WRC-19)**;
- 2.11 to consider a new Earth exploration-satellite service (Earth-to-space) allocation in the frequency band 22.55-23.15 GHz, in accordance with Resolution **664 (WRC-19)**;
- 2.12 to consider the use of existing International Mobile Telecommunications (IMT) identifications in the frequency range 694-960 MHz, by consideration of the possible removal of the limitation regarding aeronautical mobile in IMT for the use of IMT user equipment by non-safety applications, where appropriate, in accordance with Resolution **251 (WRC-19)**;
- 2.13 to consider a possible worldwide allocation to the mobile-satellite service for the future development of narrowband mobile-satellite systems in frequency bands within the frequency range [1.5-5 GHz], in accordance with Resolution **248 (WRC-19)**;
- 3 to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with *further resolves* of Resolution **27 (Rev.WRC-19)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with the principles contained in *resolves* of that Resolution;
- 4 to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the conference;
- 5 in accordance with Resolution **95 (Rev.WRC-19)**, to review the Resolutions and Recommendations of previous conferences with a view to their possible revision, replacement or abrogation;
- 6 to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the ITU Convention;
- 7 to identify those items requiring urgent action by the radiocommunication study groups;
- 8 to consider possible changes, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, on advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution **86 (Rev.WRC-07)**, in order to facilitate the rational, efficient and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;

9 to consider and take appropriate action on requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, taking into account Resolution **26 (Rev.WRC-19)**;

10 to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the ITU Convention;

10.1 on the activities of the Radiocommunication Sector since WRC-23;

10.2 on any difficulties or inconsistencies encountered in the application of the Radio Regulations<sup>1</sup>; and

10.3 on action in response to Resolution **80 (Rev.WRC-07)**;

11 to recommend to the ITU Council items for inclusion in the agenda for the next world radiocommunication conference, and items for the preliminary agenda of future conferences, in accordance with Article 7 of the ITU Convention and Resolution **804 (Rev.WRC-19)**,

*invites the ITU Council*

to finalize the agenda and arrange for the convening of WRC-27, and to initiate as soon as possible the necessary consultations with Member States,

*instructs the Director of the Radiocommunication Bureau*

1 to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting (CPM) and to prepare a report to WRC-27;

2 to submit a draft Report on any difficulties or inconsistencies encountered in the application of the Radio Regulations as referred in agenda item 10.2 to the second session of CPM and to submit the final Report at least five months before the next WRC,

*instructs the Secretary-General*

to communicate this Resolution to international and regional organizations concerned.

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<sup>1</sup> This agenda sub-item is strictly limited to the Report of the Director on any difficulties or inconsistencies encountered in the application of the Radio Regulations and the comments from administrations. Administrations are invited to inform the Director of the Radiocommunication Bureau of any difficulties or inconsistencies encountered in the Radio Regulations.

**RECOMMENDATION 208 (WRC-19)**

**Harmonization of frequency bands for evolving  
Intelligent Transport Systems applications  
under mobile-service allocations**

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

*considering*

- a)* that information and communication technologies are integrated in a vehicle system to provide evolving Intelligent Transport Systems (ITS) communication applications for the purpose of improving traffic management and assisting safer driving;
- b)* that there is a need for consideration of spectrum harmonization for evolving ITS applications, which are being used globally or regionally;
- c)* that there is a need to integrate various technologies, including radiocommunications, into land transportation systems;
- d)* that many new connected vehicles use intelligent technologies in the vehicles' combined advanced traffic-management, advanced traveller-information, advanced public transportation-management and/or advanced fleet-management systems to improve traffic management;
- e)* that future vehicular radiocommunication technologies and ITS broadcast systems are emerging;
- f)* that some frequency bands harmonized for ITS are also allocated to the fixed-satellite service (FSS) (Earth-to-space), which under certain circumstances may cause potential interference to ITS stations while in close proximity,

*recognizing*

- a)* that harmonized spectrum and international standards facilitate worldwide deployment of evolving ITS radiocommunications and provide for economies of scale in bringing evolving ITS equipment and services to the public;
- b)* that the use of frequency bands harmonized for evolving ITS, or parts thereof, does not preclude the use of these bands/frequencies by any other application of the services to which they are allocated and does not establish priority in the Radio Regulations;
- c)* that in those harmonized frequency bands or parts thereof for evolving ITS, there are existing services whose protection needs to be ensured;
- d)* that evolving ITS also becomes important in helping to reduce road traffic problems such as congestion and accidents;
- e)* that ITU-R studies on evolving ITS technologies are meant to address road safety and efficiency-related matters,

*noting*

- a) that the ITU-R Recommendations on ITS are Recommendations ITU-R M.1452, M.1453, M.1890, M.2057, M.2084 and M.2121;
- b) that the ITU-R Reports on ITS are Reports ITU-R M.2228, M.2322, M.2444 and M.2445;
- c) that some administrations have deployed or are considering deployment of radiocommunication local area networks in some frequency bands recommended for evolving ITS,

*recommends*

- 1 that administrations consider using globally or regionally harmonized frequency bands, or parts thereof, as described in the most recent versions of Recommendations (e.g. ITU-R M.2121), when planning and deploying evolving ITS applications, taking into account *recognizing b)* above;
- 2 that administrations take into account, if necessary, coexistence issues between ITS stations and stations of existing services (e.g. FSS earth stations), taking into account *considering f)*,

*invites Member States and Sector Members*

to participate actively in and to contribute to ITU-R studies on aspects of ITS and evolving ITS (e.g. connected vehicles, autonomous vehicles, adaptive driver assistance systems), through the ITU-R study groups,

*instructs the Secretary-General*

to bring this Recommendation to the attention of relevant international and regional organizations, in particular standards development organizations, dealing with ITS.