|  |  |
| --- | --- |
| **World Radiocommunication Conference (WRC-19) Sharm el-Sheikh, Egypt, 28 October – 22 November 2019** |  |
|  |  |
|  |  |
| PLENARY MEETING | **Addendum 24 to Document 16-E** |
|  | **16 October 2019** |
|  | **Original: English** |
|  | |
| European Common Proposals | |
| Proposals for the work of the conference | |
|  | |
| Agenda item 10 | |

10 to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, in accordance with Article 7 of the Convention.

Introduction

Agenda item 10 requests WRC-19 to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its view on the preliminary agenda for the subsequent Conference and on possible agenda items for future Conferences, taking into account Resolution **810 (WRC‑15)**.

The European proposals for the Agenda for WRC-23 builds upon some of the preliminary agenda items contained in Resolution **810 (WRC-15)**, as well as proposals for the consideration of new topics.

On a general basis, all proposed agenda items have to be considered under the general principle to take due regard to the requirements of existing and future services in the frequency bands under consideration in a view of not putting undue constraints on existing services.

On this basis, Europe proposes that WRC-19 suppresses Resolution **810 (WRC-15)** and adopts the new Resolution **[EUR-A10] (WRC-19)** as the basis for the provisional agenda for WRC-23 for adoption by the Council.

Proposals

SUP EUR/16A24/1

RESOLUTION 810 (WRC‑15)

Preliminary agenda for the 2023 World Radiocommunication Conference

**Reasons:** The Resolution is not needed anymore.

ADD EUR/16A24/2

Draft New Resolution [EUR-A10] (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 should be established four to six years in advance and a final agenda shall be established by the Council two years before the conference;

*b)* Article 13 of the ITU Constitution relating to the competence and scheduling of world radiocommunication conferences and Article 7 of the Convention relating to their agendas;

*c)* the relevant resolutions and recommendations of previous world administrative radio conferences (WARCs) and world radiocommunication conferences (WRCs),

recognizing

that, in preparing this agenda, many 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 world radiocommunication conference be held in 2023 for a 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 possible spectrum needs and regulatory actions to support Global Maritime Distress and Safety System (GMDSS) modernization and the implementation of e‑navigation, in accordance with Resolution **361 (WRC-15)**;

1.2 to conduct, and complete in time for WRC‑23, studies for a possible new allocation to the Earth exploration-satellite (active) service for space-borne radar sounders within the range of frequencies around 45 MHz, taking into account the protection of incumbent services, in accordance with Resolution **656 (WRC-15);**

1.3 in accordance with Resolution **657 (Rev.WRC‑19)**, to 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 providing appropriate recognition and protection in the Radio Regulations without placing additional constraints on incumbent services;

1.4 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)**;

1.5 to consider a new allocation to the AMS(R)S in all or part of the frequency band 112-137 MHz in order to support both the uplink and downlink of aeronautical VHF applications, while preventing any undue constraints on existing systems operating in the AM(R)S, the ARNS, and in adjacent frequency bands, in accordance with Resolution **[EUR-B10-2] (WRC-19)**;

1.6 to conduct studies on spectrum needs, coexistence with radiocommunication services and regulatory measures for the possible introduction of new non-safety aeronautical mobile applications in accordance with Resolution **[EUR-C10-3] (WRC-19)**;

1.7 to consider the removal of the limitation regarding aeronautical mobile in the IMT frequency bands within the frequency range 694-960 MHz for non-safety applications, where appropriate, in accordance with Resolution **[EUR-D10-4] (WRC-19)**;

1.8 to review Appendix **27** of the ITU Radio Regulations in order to **accommodate** digital technologies for commercial aviation safety-of-life applications in existing HF bands allocated to the aeronautical mobile (route) service and enable the coexistence of current HF systems alongside modernized HF systems, in accordance with Resolution **[EUR-E10-5] (WRC-19)**;

1.9 to consider any change to the Radio Regulation as appropriate based on the outcome of studies conducted to identify any required technical and operational measures, in relation to stations on-board sub-orbital vehicles, to avoid harmful interference between radiocommunication services and existing applications operated in the same service in accordance with Resolution **[EUR-F10-6] (WRC-19)**;

1.10 to review the technical and regulatory conditions pertaining to the 18.6-18.8 GHz frequency band to address possible new fixed-satellite service usage and the protection of the Earth exploration-satellite service (EESS) (passive) in accordance with Resolution **[EUR-G10-7] (WRC‑19)**;

1.11 to study and develop technical, operational and regulatory measures, as appropriate, to facilitate the use of the frequency bands 17.7-18.6 (space-to-Earth), 18.8-20.2 GHz (space-to-Earth), 27.5‑30.0 GHz (Earth-to-space) by non-GSO FSS ESIM, while ensuring due protection of existing services in those frequency bands in accordance with Resolution **[EUR-H10-8] (WRC‑19)**;

1.12 to study technical, operational issues, and regulatory provisions for transmissions in the Earth-to-space direction in the 27.5-30 GHz frequency band and space-to-Earth direction in frequency bands 17.7-18.6 GHz and 18.8-20.2 GHz between non-geostationary satellites to other satellites in the fixed-satellite service frequency bands, in accordance with Resolution **[EUR-I10-9] (WRC-19)**;

1.13 to consider the protection of geostationary satellite networks operating in 7/8 and 20/30 GHz from emissions of non-geostationary satellite systems operating in the same frequency bands and identical directions, in accordance with Resolution **[EUR-J10-10] (WRC-19)**;

1.14 to consider, appropriate regulatory actions, with a view to reviewing and, if necessary, revising Resolution **155 (WRC-15)** and No. **5.484B** in accordance with Resolution **[EUR-K10-11] (WRC-19)**;

1.15 to harmonize globally the use of the frequency band 12.75-13.25 GHz by earth stations on aircraft communicating with geostationary space stations in the fixed-satellite service (Earth-to-space), in accordance with Resolution to harmonize globally the use of the frequency band 12.75-13.25 GHz by earth stations on aircraft communicating with geostationary space stations in the fixed-satellite service(Earth-to-space), in accordance with Resolution **[EUR-L10-12] (WRC‑19)**;

1.16 to consider a new EESS (Earth-to-space) allocation in the frequency band 22.55-23.15 GHz, in accordance with Resolution **[EUR-M10-13] (WRC-19)**;

1.17 to consider new allocations to the mobile-satellite service (MSS) in various frequency bands in the 2 GHz range for low power data collection systems via satellites in accordance with Resolution **[EUR-N10-14] (WRC-19)**;

1.18 to consider, based on the results of ITU‑R studies:

1.18.1 the introduction of pfd and EIRP limits in Article **21** for the frequency bands 71-76 GHz and 81‑86 GHz in accordance with Resolution **[EUR-O10-15] (WRC-19)**;

1.18.2 the conditions for the use of the 71-76 GHz and 81-86 GHz frequency bands by stations in the satellite services to ensure compatibility with passive services in accordance with Resolution **[EUR-P10-16] (WRC-19)**;

1.19 to address the following two issues to accommodate requirements for spectrum usage above 231.5 GHz:

1.19.1 to consider, in accordance with Resolution **[EUR-Q10-17] (WRC-19)** additional spectrum allocations to the radiolocation service on a co-primary basis in the frequency band 231.5-275 GHz and identification for radiolocation applications in frequency bands in the range 275-700 GHz for millimetre and sub-millimetre wave imaging systems;

1.19.2 to review and consider possible adjustments of the existing or possible new primary frequency allocations to EESS (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 **[EUR-R10-18] (WRC-19)**;

1.20 to review the amateur service secondary allocation in the 1 240-1 300 MHz frequency band to determine if additional measures are required to ensure the protection of the radionavigation-satellite (space-to-Earth) service operating in the same band in accordance with Resolution **[EUR-S10-19] (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 Resolution **28 (Rev.WRC‑15)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with the principles contained in Annex 1 to Resolution **27 (Rev.WRC‑12)**;

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‑07)**, 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 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: “Advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks”, in accordance with Resolution **86 (Rev.WRC-07)**;

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‑07)**;

9 to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention:

9.1 on the activities of the Radiocommunication Sector since WRC‑19;

9.2 on any difficulties or inconsistencies encountered in the application of the Radio Regulations[[1]](#footnote-1)\*; and

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

10to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, in accordance with Article 7of the Convention,

resolves further

to activate the Conference Preparatory Meeting,

invites the 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

to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting and to prepare a report to WRC‑23,

instructs the Secretary-General

to communicate this Resolution to international and regional organizations concerned.

MOD EUR/16A24/3

RESOLUTION 657 (REV.WRC-19)

Spectrum needs and protection of space weather sensors

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

considering

*a)* that space weather observations are becoming increasingly important in detecting solar activity events that could impact on services critical to the economy, safety and security of administrations;

*b)* that these observations are also made from platforms that may be ground-based, airborne or space-based;

*c)* that some of the sensors operate by receiving low-level natural emissions of the Sun or the Earth’s atmosphere, and therefore may suffer harmful interference at levels which could be tolerated by other radio systems;

*d)* that space weather sensor technology has been developed and operational systems have been deployed without much regard for domestic or international spectrum regulations, or for the potential need for protection from interference,

recognizing

*a)* that no frequency bands have been documented in any manner in the Radio Regulations for space weather sensor applications;

*b)* that the ITU Radiocommunication Sector (ITU-R) has a Study Question ITU-R 256/7 to study the technical and operational characteristics, frequency requirements and appropriate radio service designation for space weather sensors;

*c)* that any regulatory action associated with space weather sensor applications should take into account incumbent services that are already operating in the frequency bands of interest,

resolves to invite the 2023 World Radiocommunication Conference

while taking into account the results of ITU‑R studies and without placing additional constraints on incumbent services, to consider regulatory conditions/provisions for appropriately covering space weather in the Radio Regulations,

invites ITU-R

1 to identify, in time for WRC‑23, and based on the existing ITU-R studies, specific space weather sensors which need to be protected by appropriate regulation;

2 to determine, in time for WRC‑23, the appropriate radio service designations for space weather sensors;

3 to conduct, in time for WRC‑23 and based on existing ITU-R studies, any necessary sharing studies for incumbent systems operating in frequency bands used by space weather sensors, for both active and passive sensors, with the objective of determining appropriate regulatory provisions that can be provided while not placing additional constraints on incumbent services;

4 to describe in the Radio Regulations, for example in a WRC-19 Resolution and/or in Article **1** or **4**, as appropriate, the space weather systems and corresponding usages,

invites administrations

to participate actively in the studies and provide the technical and operational characteristics of the systems involved by submitting contributions to ITU‑R,

instructs the Secretary-General

to bring this Resolution to the attention of the World Meteorological Organization (WMO) and other international and regional organizations concerned.

ADD EUR/16A24/4

Draft New Resolution [EUR-B10-2] (WRC-19)

New allocation to the aeronautical mobile‑satellite (R) service within the frequency band 112-137 MHz in order to support both the uplink and downlink of aeronautical VHF applications

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

considering

*a)* that the frequency band 108-117.975 MHz is allocated on a primary basis to the aeronautical radionavigation service (ARNS), and to the aeronautical mobile (R) service (AM(R)S) in accordance with Resolution **413 (Rev.WRC-12)**;

*b)* that under No. **5.197A** of the Radio Regulations the use of the frequency band 108-112 MHz by the AM(R)S shall be limited to systems composed of ground-based transmitters and associated receivers that provide navigational information in support of air navigation functions in accordance with recognized international aeronautical standards;

*c)* that the frequency band 117.975-137 MHz is allocated on a primary basis to the AM(R)S and is used by air-ground, air-air, and ground-air systems operated in accordance with ICAO standards and recommended practices (SARPS), providing critical voice and data communications for Air Traffic Management (ATM) on a global basis;

*d)* that under No. **5.201** and No. **5.202** of the Radio Regulations, the frequency bands 132-136 MHz and 136-137 MHz are also allocated in several countries to the aeronautical mobile (OR) service on a primary basis,

recognizing

*a)* that the optimization of air traffic management over oceanic and remote areas necessitates appropriate aeronautical surveillance and communication means, in order to meet the required communication performance for reduced separation minima, without modification to aircraft equipment;

*b)* that the frequency band 1 087.7-1 092.3 MHz was allocated to AMS(R)S (Earth-to-space) on a primary basis in order to extend reception of Automatic Dependent Surveillance-Broadcast (ADS‑B) signals beyond terrestrial line-of-sight, thereby facilitating the availability of surveillance means anywhere in the world;

*c)* that the availability of appropriate communication means is still an issue over oceanic and remote areas, where there is currently no suitable solution to provide aeronautical Very High Frequency (“VHF”) voice services;

*d)* that satellite communication systems may complement terrestrial communication infrastructures in oceanic and remote areas in order to meet the evolving requirements of modern civil aviation,

noting

*a)* that Annex 10 to the International Civil Aviation Organization (ICAO) Convention on International Civil Aviation contains Standards and Recommended Practices (SARPs) for safety aeronautical radionavigation and radiocommunication systems used by international civil aviation;

*b)* that the development of compatibility criteria between new AMS(R)S systems proposed for operations in the frequency band 112-137 MHz and ICAO-standardized aeronautical systems in this frequency band is the responsibility of ICAO;

*c)* that feeder links of AMS(R)S systems involving communications between aeronautical earth stations and space stations may be accommodated in the fixed-satellite service,

resolves to invite ITU-R

1 to study the compatibility between new AMS(R)S systems that may use the frequency band 112‑137 MHz in the Earth-to-space and space-to-Earth directions to support aeronautical VHF applications in oceanic and remote areas, and AM(R)S, ARNS and existing primary services in adjacent frequency bands;

2 taking into account the results of the above study, to provide technical, regulatory and operational recommendations to the Conference, enabling that Conference to decide on a possible new allocation to AMS(R)S (Earth-to-space and space-to-Earth) within the frequency band 112-137MHz, while preventing any undue constraints on existing systems operating in the AM(R)S, the ARNS, and in adjacent frequency bands,

invites the 2023 World Radiocommunication Conference

to consider the results of the studies above and take appropriate actions,

invites the International Civil Aviation Organization

to participate actively in the studies by providing requirements and information that should be taken into account in ITU-R studies,

instructs the Secretary-General

to bring this Resolution to the attention of the ICAO and the International Air Transport Association (IATA).

Proposals on an agenda item for WRC-23

**Subject: New allocation to AMS(R)S within the frequency band 112-137 MHz** **in order to support both the uplink and downlink of aeronautical VHF applications**

**Origin:** CEPT

|  |  |
| --- | --- |
| ***Proposal*:**  To consider a new allocation to the AMS(R)S in all or part of the frequency band 112-137 MHz in order to support both the uplink and downlink of aeronautical VHF applications, while preventing any undue constraints on existing systems operating in the AM(R)S, the ARNS, and in adjacent frequency bands, in accordance with Resolution **[EUR-B10-2]** **(WRC-19)**. | |
| ***Background/reason*:**  In order to apply radar-like or other similar reduced separation minima over oceanic and remote areas, appropriate surveillance and communications are required.  WRC-15 allocated the frequency band 1 087.7-1 092.3 MHz for reception of aircraft Automatic Dependent Surveillance – Broadcast (“ADS-B”) messages by space stations. Space-based ADS-B is expected to perform like terrestrial ADS-B sensors without any need for avionic modification.  However, appropriate communication means is still an issue for oceanic and remote areas, and there is currently no suitable solution to provide Very High Frequency (“VHF”) voice services over these areas. It is hence proposed to consider a potential solution using VHF radios relay installed onboard satellites (“space-based VHF”), which would be an effective complementary communication service to the space-based ADS-B. This requires a new allocation to the Aeronautical Mobile Satellite (R) Service (AMS(R)S) in all or part of the frequency band 112-137 MHz.  Currently there is no practical and cost effective solution to provide VHF voice services over oceanic and some remote areas. Although High Frequency (“HF”) voice, satellite voice (“SATVOICE”) and controller-pilot data link communications (“CPDLC”) may be used in lieu of VHF voice, these technologies are currently not considered as direct controller-pilot communications (“DCPC”) for supporting radar-like or other similar reduced separation minima (e.g. 3, 5 or 10 NM). Moreover, not all aircraft are equipped with SATVOICE and/or CPDLC. Whereas, VHF voice communications relay would meet the required communication performance (“RCP”) for reduced separation minima, without modification to aircraft equipment.  The frequency bands adjacent to the bands 112-137 MHz are allocated to the Broadcasting Service, Space Operation Service (space-to-Earth), Meteorological-Satellite Service (space-to-Earth), Mobile-Satellite Service (space-to-Earth), Space Research Service (space-to-Earth) which status and existing regulations should not be affected by this proposed agenda item. | |
| ***Radiocommunication services concerned*:**  Aeronautical Mobile (R) Service, Aeronautical Radionavigation Service, Aeronautical Mobile (OR) Service. | |
| ***Indication of possible difficulties*:**  Sharing studies with existing VHF AM(R)S, ARNS, and other services in the adjacent frequency bands | |
| ***Previous/ongoing studies on the issue*:**  Not applicable | |
| ***Studies to be carried out by*:**  ITU-R | ***with the participation of*:** Administrations, ITU-R Sector Members, ICAO and Aviation Authorities |
| ***ITU‑R Study Groups concerned*:**  SG 4 and 5 | |
| ***ITU resource implications, including financial implications (refer to CV126)*:**  This proposed agenda item will be studied as part of the regular ITU-R procedures and planned budget. | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks***  This proposed agenda item is supported by ICAO | |

ADD EUR/16A24/5

Draft New Resolution [EUR-C10-3] (WRC-19)

Studies on frequency-related matters, including possible additional allocations, for the possible introduction of new non-safety aeronautical mobile applications

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

considering

*a)* that the number of aircraft equipped with sensors has grown significantly in the past 20 years;

*b)* that the need for bidirectional low to high data rate communications between aeronautical stations and aircraft stations, or between aircraft stations is consequently increasing;

*c)* that the considered communication data links implement channel bandwidths from some kHz up to some hundreds of MHz requiring to study frequencies in the VHF range up to 23 GHz;

*d)* that the frequency bands to be considered should be preferably chosen close to bands already used by aeronautical communication systems to enable extended tuning ranges for such new aeronautical communication systems;

*e)* that these new aeronautical communications are not related to safety of flights;

*f)* that there is no clear identification of those frequency bands in which these new aeronautical communication systems may be developed with a sufficient level of confidence for long term investment by industry;

*g)* that the decisions of previous conferences have introduced some restrictions to the use and have imposed constraints on the development of these communication systems within several existing mobile allocations traditionally used by the aeronautical mobile applications;

*h)* that the existing mobile allocations which can be used by these communication systems have some limitations due to coexistence with other services in the band;

*i)* that in Region 1, there are allocations to the mobile except aeronautical mobile service in some frequency bands which are allocated to the mobile service in Regions 2 and 3;

*j)* that harmonized worldwide allocation would facilitate the implementation of these new aeronautical communication systems;

*k)* the only frequency ranges beyond 400 MHz, worldwide identified for aeronautical mobile applications other than those with the mobile allocation, those en route (R) or for telemetry are beyond 55 GHz as per No. **5.558**;

*l)* that an adaptation of the regulatory framework for further visibility, protection and development of non-safety aeronautical mobile applications may be required,

recognizing

*a)* that the use innovative sharing methods may be considered to ensure the protection of existing services while offering the possibility to have access to new frequency bands;

*b)* that the implementation of tuning ranges may allow granting authorization depending on national circumstances and spectrum policies;

*c)* that the use of frequencies of Appendix **18** to the Radio Regulation for the maritime VHF communication shall be protected,

noting

*a)* that the frequency band 5 000-5 010 MHz is allocated to the radionavigation satellite service (Earth-to-space) on a primary basis in all Regions;

*b)* that the frequency band 15.4-15.7 GHz is allocated to the radiolocation, aeronautical radionavigation and, part of, to the fixed-satellite (Earth-to-space) service on a primary basis;

*c)* that the frequency band 5 000-5 010 MHz is adjacent to the frequency band 5 010-5 030 MHz which is allocated to the radionavigation-satellite (space-to-Earth) (space-to-space) service on a primary basis;

*d)* that the frequency bands 162.0375-174 MHz, 862-874 MHz and 22-22.21 GHz are allocated on a primary basis to the mobile except aeronautical mobile service;

*e)* that Nos. **5.312** and **5.323** allocate the 645-960 MHz frequency band or parts thereof to the aeronautical radionavigation service on a primary basis in several countries of Region 1;

*f)* that the frequency bands 5 000-5 010 MHz and 15.4-15.7 GHz are adjacent respectively to the frequency band 4 990-5 000 MHz and 15.35-15.4 GHz which are allocated to the radio astronomy service on a primary basis;

*g)* that the frequency band 22.01-22.21 GHz is covered by No. **5.149**,

resolves to invite ITU-R

1 to study spectrum needs for new non-safety aeronautical mobile applications for air to air, ground to air and air to ground communications of aircraft systems;

2 to study the frequency bands 162.0375-174 MHz, 862-874 MHz and 22-22.21 GHz already allocated on a primary basis to the mobile except aeronautical mobile service, in order to evaluate the possible revision or deletion of the “except aeronautical mobile” restriction while ensuring the continued operation and the protection of existing services in the considered frequency bands and, as appropriate, adjacent frequency bands, and not constraining future development of these services;

3 to study possible new primary allocations to the aeronautical mobile service in the frequency bands 5 000-5 010 MHz and 15.4-15.7 GHz, while ensuring the continued operation and the protection of existing services in the considered frequency bands and, as appropriate, adjacent frequency bands, and not constraining future development of these services;

4 to review studies in *resolves to invite ITU-R* 1 to 3 and elaborate regulatory measures for the possible introduction of new non-safety aeronautical mobile applications;

5 to complete studies in time for WRC-23,

invites the 2023 World Radiocommunication Conference

to review the results of these studies and take appropriate actions,

invites administrations

to participate actively in the studies by submitting contributions to ITU-R.

Proposals on an agenda item for WRC-23

**Subject: Studies on frequency-related matters, including possible additional allocations, for the possible introduction of new non-safety aeronautical mobile applications**

**Origin:** CEPT

|  |  |
| --- | --- |
| ***Proposal*:**  In accordance with Resolution [EUR-C10-3] **(WRC-19)**, to review studies on spectrum needs, coexistence with radiocommunication services and regulatory measures for the possible introduction of new non-safety aeronautical mobile applications.  – Spectrum needs for new non-safety aeronautical mobile applications for air to air, ground to air and air to ground communications of aircraft systems.  – Studies within the frequency bands already allocated on a primary basis to the mobile except aeronautical mobile service above 160 MHz and up to 23 GHz in order to evaluate the possible revision or deletion of the “except aeronautical mobile” restriction. The following frequency bands are proposed to be studied: 162.0375-174 MHz, 862-874 MHz and 22-22.21 GHz.  – Study possible new primary allocations to the aeronautical mobile service in the frequency bands 5 000-5 010 MHz and 15.4-15.7 GHz, while ensuring the continued operations and the protection of existing services in those frequency bands and, as appropriate, adjacent frequency bands, and not constraining future development of these services. | |
| ***Background/reason*:**  The number of aircraft equipped with sensors has grown significantly in the past 20 years together with the need of bidirectional low to high data rate communications.  One can mention the following applications: fire surveillance, border surveillance, air quality and environment monitoring, traffic monitoring, disaster monitoring, terrain modelling, imagery (visible, infrared, radar, meteo), video monitoring. Such applications require communications identification, sensor control or synchronization and for access to ground databases.  Consequently the need of non-safety data communications between various types of aeronautical platforms exponentially increases.  At the same time, there is no clear identification of those frequency bands in which non-safety aeronautical mobile applications may be developed with a sufficient level of confidence for long term use by the industry. In addition, the existing mobile allocations which can be used for non-safety aeronautical mobile applications have some limitations due to coexistence with other services in the frequency band. Furthermore the decisions of previous Conferences have introduced some restrictions to the use and have imposed constraints on the development of aeronautical mobile applications within some existing mobile allocations traditionally used by the aeronautical mobile applications.  In consequence an adaptation of the regulatory framework for further visibility, protection and development of non-safety aeronautical mobile applications is required. Use of innovative sharing methods may be considered to ensure the protection of existing services while offering the possibility to have access to new frequency bands. The sharing methods could consider, for example, to take into account the separation linked to the altitude of the aircraft or power control. In addition, the access may be supported by effective tuning ranges and may be authorized depending on national circumstances and spectrum policies.  Several frequency bands are proposed for investigation within different ranges in order to meet the various operational requirements for new non-safety aeronautical mobile applications. Implementation of separation distances for such aeronautical systems or pfd limits or other regulatory measures may be envisaged. | |
| ***Radiocommunication services concerned*:**  Mobile service and aeronautical mobile service | |
| ***Indication of possible difficulties*:**  Protection of existing services within the frequency bands and adjacent frequency bands allocated to the mobile except aeronautical mobile service.  Protection of existing services within the frequency bands and adjacent frequency bands proposed for a new allocation to the aeronautical mobile service. | |
| ***Previous/ongoing studies on the issue*:**  No recent studies for aeronautical mobile applications, other than those for related to safety. | |
| ***Studies to be carried out by*:**  ITU-R WP 5B | ***with the participation of*:** |
| ***ITU‑R Study Groups concerned*:**  SG 4, 5, 6 and 7 | |
| ***ITU resource implications, including financial implications (refer to CV126)*:**  This proposed agenda item will be studied within the normal ITU-R procedures and planned budget. | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks*** | |

ADD EUR/16A24/6

Draft New Resolution [EUR-D10-4] (WRC-19)

Removal of the limitation regarding aeronautical mobile in the frequency range 694-960 MHz for non-safety IMT applications

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

considering

*a)* that there is a need for greater connectivity of aeronautical vehicles to address existing, growing and new requirements from the aeronautical community;

*b)* that current and future IMT networks can provide connectivity services to helicopters, small aircraft and Unmanned Aircraft Systems (UAS) at low and medium altitude;

*c)* that current and future IMT networks may provide communication functions for the beyond visual line-of-sight operation of UAS;

*d)* that current and future IMT networks may provide communications functions for UAS traffic management systems;

*e)* that UAS may use IMT technology for direct communication, for example for sense and avoid functions;

*f)* that future IMT networks may support direct air to ground connectivity services to commercial airplanes with specific equipment on-board airplane;

*g)* that base stations located on helicopters, small aircraft and UAS at low and medium altitude may provide connectivity services to IMT terminals;

*h)* that base stations located on aircraft flying at high altitude may provide connectivity services to IMT terminals;

*i)* that the IMT capacities identified in the *considering* above have been demonstrated feasible by several studies and are currently being developed by Standards Development Organizations,

noting

*a)* that ITU-R sharing and compatibility studies supporting the identification of specific frequency bands to IMT did not consider the use cases described in *considering b)* to *h)*;

*b)* that some frequency bands identified for IMT are allocated to the mobile except aeronautical mobile service;

c*)* that the 694-960 MHz frequency band is allocated on a primary basis to the mobile except aeronautical mobile service in Region 1;

*d)* that the 890-902 MHz and 928-942 MHz frequency bands are allocated on a primary basis to the mobile except aeronautical mobile service in Region 2 and that the 902-928 MHz frequency band is allocated on a secondary basis to the mobile except aeronautical mobile service in Region 2;

*e)* that Nos. **5.312** and **5.323** allocate the 645-960 MHz frequency band or parts thereof to the aeronautical radionavigation service on a primary basis in several countries of Region 1;

*f)* that the 694-960 MHz frequency band is allocated on a primary basis to the broadcasting service in Region 1;

*g)* that Resolution **224 (Rev.WRC-15)** addresses frequency bands for the terrestrial component of International Mobile Telecommunications below 1 GHz;

*h)* that Resolution **749 (WRC-15)**addresses the use of the frequency band 790-862 MHz in countries of Region 1 and the Islamic Republic of Iran by mobile applications and by other services;

*i)* that Resolution **760 (WRC-15)** addresses provisions relating to the use of the frequency band 694-790 MHz in Region 1 by the mobile, except aeronautical mobile, service and by other services,

resolves to invite ITU-R

for the frequency range 694–960 MHz in Region 1 and the frequency band 890-942 MHz in Region 2:

1 to assess relevant aeronautical mobile service scenarios for air to ground and ground to air connectivity for airborne BS and UE in IMT networks to be addressed in compatibility and sharing studies;

2 to identify relevant technical parameters associated with the aeronautical mobile systems;

3 to conduct sharing and compatibility studies with existing services, including in adjacent frequency bands as appropriate (see *noting* *a)* to *f)*);

4 to determine the applicability to remove the exception of the aeronautical mobile service or other suitable regulatory measures in the frequency range 694-960 MHz in Region 1 and 890-942 MHz in Region 2 based on the results of studies,

invites the 2023 World Radiocommunication Conference

to consider the results of the above studies and take appropriate actions.

Proposals on an agenda item for WRC-23

**Subject: Air-to-ground and ground-to-air connectivity for airborne BS and UE in IMT frequency bands within 694-960 MHz for non-safety applications**

**Origin:** CEPT

|  |  |
| --- | --- |
| ***Proposal*:**  to consider the removal of the limitation regarding aeronautical mobile in the IMT frequency bands within the frequency range 694-960 MHz for non-safety applications, where appropriate in accordance with Resolution **[EUR-D10-4](WRC-19)**. | |
| ***Background/reason*:**  There is a growing demand for  – affordable air to ground and ground to air connectivity, due the rising expectation for connectivity in e.g. helicopters and small airplanes. Several test campaigns have demonstrated that IMT networks can respond to this type of connectivity demand,  – platforms capable of providing IMT coverage either in areas where there is no terrestrial network, or in case of disaster and the potential unavailability of the terrestrial network.  Standards Developing Organizations (SDOs) such as 3GPP are currently standardizing functionalities to support these use cases.  IMT networks with national coverage rely on the frequency range 694-960 MHz. However, the 694‑960 MHz frequency range is currently allocated to the ‘MOBILE, except aeronautical mobile’ service in Region 1, which would prevent or at least restrict the possibility to connect Unmanned Aircraft to IMT network. Similar restrictions apply in 890-942 MHz in Region 2. | |
| ***Radiocommunication services concerned*:**  Mobile service, fixed service, aeronautical radionavigation service and broadcasting service | |
| ***Indication of possible difficulties*:**  Sharing studies with radiocommunication services in band and in adjacent bands | |
| ***Previous/ongoing studies on the issue*:** | |
| ***Studies to be carried out by*:**  ITU-R SG 5 (WP 5D) | ***with the participation of*:**  **---** |
| ***ITU‑R Study Groups concerned*:**  SG 5 (WP 5B), 6 (WP 6A) | |
| ***ITU resource implications, including financial implications (refer to CV126)*:** | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks*** | |

ADD EUR/16A24/7

Draft New Resolution [EUR-E10-5] (WRC-19)

Consideration of regulatory provisions for updating Appendix 27 of the Radio Regulations in support of aeronautical HF modernization

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

considering

*a)* that with the availability of advanced digital technologies and demonstrated capabilities of aeronautical wideband high frequency (HF) through channel bonding, faster data rates and better voice communications are possible;

*b)* that in the context of aeronautical HF communications, the term “wideband” refers to the aggregation of 3 kHz channels to provide improved data rates;

*c)* that digital aeronautical HF must coexist with existing aeronautical analogue voice and data HF systems;

*d)* that desirable properties of HF propagation enable global coverage for aircraft;

*e)* that aeronautical analogue voice and narrow band digital HF systems are the primary means for international and domestic aviation to communicate with aircraft in remote and oceanic areas;

*f)* that the operational need for the modernization of data link services in the HF band for messages related to the safety and regularity of flight for use by international civil aviation;

*g)* that current aeronautical HF systems are limited by the available technology, and are insufficient to meet many modern aircraft information requirements without being augmented by aeronautical safety satellite communications;

*h)* that the use of the frequencies in the frequency bands allocated to the aeronautical mobile (route) service (AM(R)S) in the bands between 2 850-22 000 kHz is governed by the provisions of Appendix **27**,

noting

*a)* the special arrangements clause in Appendix **27** for classes of emissions other than J3E or H2B;

*b)* the existing regional frequency allotments are detailed in Appendix **27** for aeronautical HF in the AM(R)S service;

*c)* that Appendix **27** provides international and regional allotments for HF channels within the AM(R)S*;*

*d)* the current aeronautical HF narrow band digital communications are detailed in Recommendation ITU-R M.1458;

*e)* that inter-system compatibility between internationally standardized aeronautical equipment is the responsibility of ICAO;

*f)* that new HF channel bonding technology allows for variable bandwidths of up to 48 kHz, in 3 kHz steps,

recognizing

*a)* the need for improving aeronautical HF performance in support of internationally recognized aviation performance standards as defined by ICAO;

*b)* that Annex 10 Volume III to the Convention on International Civil Aviation is a part of International Standards and Recommended Practices (SARPs) for the current aeronautical narrowband HF communications systems used by international civil aviation;

*c)* that the modernization of aeronautical HF communications will not require any changes to allocations in Article **5** of the Radio Regulations;

*d)* that 3 023 kHz and 5 680 kHz as designated for search and rescue Appendix **15** of the Radio Regulations,

resolves to invite ITU-R

1 to identify any necessary modifications to Appendix **27** regarding the assignment of digital aeronautical wideband HF channels for the aeronautical mobile (R) service in the frequency allotment assignments between 2 850 and 22 000 kHz;

2 to identify any necessary transition arrangements for the introduction of new digital aeronautical wideband HF systems and any consequential changes to Appendix **27**;

3 to recommend how new digital aeronautical wideband HF systems can be introduced while ensuring compliance with safety requirements;

4 to complete studies in time for WRC-23,

further resolves to invite WRC-23

to consider necessary changes to Appendix **27**, on the basis of the studies conducted under *resolves to invite ITU-R* above;

invites International Civil Aviation Organization

to actively participate by providing requirements and information that should be taken into account in ITU-R studies,

instructs the Secretary-General

to bring this Resolution to the attention of the International Civil Aviation Organization.

Proposals on an agenda item for WRC-23

**Subject: Revision of Appendix 27 to accommodate digital technologies in existing HF allocations in the AM(R)S.**

**Origin:** CEPT

|  |  |
| --- | --- |
| ***Proposal*:**  To review Appendix **27** of the ITU Radio Regulations in order to **accommodate** digital technologies for commercial aviation safety-of-life applications in existing HF bands allocated to the aeronautical mobile (route) service and enable the coexistence of current HF systems alongside modernized HF systems, in accordance with **[EUR-E10-5](WRC-19)**. | |
| ***Background/reason*:**  Historically, aeronautical HF (High Frequency) radiocommunications have been recognized as the primary long-range communication system for safe, efficient air travel in remote or oceanic areas beyond the range of ground-based VHF radios. Current aeronautical HF analogue single sideband systems are susceptible to static crashes from lightning and man-made noise, as well as selective fading as the atmosphere continually changes. Future HF voice systems can move to more advanced digital voice as many CODECS (Coder/Decoders) are now available commercially. Modem technology has evolved significantly over the last 25-30 years and techniques such as Automatic Link Establishment allow HF radios to find and link on the best available frequency at a given time. Use of spectrally efficient modulation techniques and aggregating HF channels for aeronautical wideband HF will support high data rate transmissions (in this context, “wideband” refers to the aggregation of multiple 3 kHz channels to provide the higher data rates).  The development of the next generation of aeronautical HF data communications will enable achieving Required Communications Performance (RCP)-240 compliance for the delivery of ATC traffic, provide for a digital voice capability that will address the frequent complaints about the noisy nature of analogue HF voice communications, and enable the reduction of the workload for flight crew by automatically assigning frequencies to aircraft radios which can be achieved with modern protocols. This effort will allow aeronautical HF and aeronautical satellite communications (SATCOM) to work well together in a complementary and synergistic fashion to offer better performance, reliability and availability than either system alone. Having both space-based and modernized terrestrial HF long range communication mitigates single point of failure concerns associated with vulnerabilities which differ for each system (e.g. solar events, rain fade, jamming, hardware failures, etc.). | |
| ***Radiocommunication services concerned*:**  Aeronautical mobile (route) service | |
| ***Indication of possible difficulties*:**  None | |
| ***Previous/ongoing studies on the issue*:**  No recent studies | |
| ***Studies to be carried out by*:**  ITU-R WP 5B | ***with the participation of*:**  ICAO |
| ***ITU‑R Study Groups concerned*:**  SG 1 and SG 5 | |
| ***ITU resource implications, including financial implications (refer to CV126)*:**  This proposed agenda item will be studied within the normal ITU-R procedures and planned budget | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks***  1) Manual on Required Communication Performance, ICAO Doc 9869 AN/462, 2006 | |

ADD EUR/16A24/8

Draft New Resolution [EUR-F10-6] (WRC-19)

Studies to accommodate the operation of sub-orbital vehicles

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

considering

*a)* that the radio spectrum is a limited resource;

*b)* that some vehicles, including space planes, may reach altitudes much higher than usual aircraft altitudes, and use non-orbital trajectories;

*c)* that a sub-orbital flight can be defined at ITU-R as an intentional flight of a vehicle expected to reach the upper atmosphere with a portion of its flight path that may occur in space without completing a full orbit around the Earth before returning back to the surface of the Earth;

*d)* that sub-orbital vehicles are being developed to fly through the lower levels of the atmosphere, where they are expected to operate in controlled or uncontrolled airspace;

*e)* that sub-orbital vehicles must safely be accommodated into airspaces used by conventional aircrafts during certain phases of flight,

recognizing

*a)* that there is no internationally agreed legal delimitation between space and atmosphere;

*b)* that the definition of sub-orbital vehicle is not agreed internationally and is applicable only for the studies conducted under this Resolution,

recognizing further

*a)* that some space launchers may include components or items not reaching orbital trajectories, and that some of these components or items may be developed as reusable items operating on sub-orbital trajectories;

*b)* that such reusable items of space launch systems, may be considered as sub-orbital vehicles or as space launch systems from radio communication perspective;

*c)* that space launch systems may have a different radiocommunication regulatory framework from that of sub-orbital vehicles,

noting

*a)* Report ITU-R M.[SUBORBITAL VEHICLES] on required technical and operational measures in relation to stations on-board sub-orbital vehicles, and spectrum requirements;

*b)* that provisions of No. **4.10** may apply for certain aspects of these operations,

resolves to invite ITU-R

1 to conduct studies to determine spectrum needs for communications on stations on board sub-orbital vehicles in particular for telemetry, telecommand and voice or data communications as well as the existing services and allocations under which these stations may be operated;

2 to study, under existing allocations:

2.1 the technical and regulatory conditions to allow stations onboard sub-orbital vehicles to operate under the aeronautical regulation and to be considered as earth stations or terrestrial stations even if a part of the flight occurs in space;

2.2 any required technical and operational measures, in relation to stations on board sub-orbital vehicles, to avoid harmful interference to other radiocommunication services and to existing applications of the same service in which stations on board sub-orbital vehicles operate;

3 to complete the studies within the next ITU Radiocommunication Sector (ITU-R) study cycle,

invites the 2023 World Radiocommunication Conference

to consider the results of the studies above and take appropriate actions,

instructs the Director of the Radiocommunication Bureau

to bring this Resolution to the attention of the ITU‑R study groups,

invites administrations

to participate actively in the studies by submitting contributions to ITU‑R,

instructs the Secretary-General

to bring this Resolution to the attention of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) and International Civil Aviation Organization (ICAO) and other international and regional organizations concerned.

Proposals on an agenda item for WRC-23

**Subject: Radiocommunications to accommodate sub-orbital vehicles**

**Origin:** CEPT

|  |  |
| --- | --- |
| ***Proposal*:**  To consider any change of Radio Regulation as appropriate based on the outcome of studies conducted to identify any required technical and operational measures, in relation to stations on board sub-orbital vehicles, to avoid harmful interference between radiocommunication services and existing applications operated in the same service in accordance with Resolution **[EUR-F10-6](WRC-19)**. | |
| ***Background/reason*:**  Issue 4 of agenda item 9.1 initiated study on sub-orbital vehicles and has identified points relative to radiocommunication that would require further work. | |
| ***Radiocommunication services concerned*:**  Space operation, mobile satellite, aeronautical mobile-satellite, aeronautical mobile-satellite (R), aeronautical mobile-satellite (OR), radionavigation-satellite, aeronautical radionavigation-satellite, radionavigation, aeronautical radionavigation, aeronautical mobile, aeronautical mobile (OR), aeronautical mobile (R) | |
| ***Indication of possible difficulties*:**  The availability of operational information needed to assume the relevant parameters and scenario for the technical studies.  The agreement on a definition of sub-orbital vehicle avoiding any impact on existing satellite launchers. | |
| ***Previous/ongoing studies on the issue*:**  An ITU-R Report, in response to agenda item 9.1 issue 9.1.4, to be submitted to SG 5, provides information on the current understanding of radiocommunications for sub-orbital vehicles including a description of the flight trajectory, categories of sub-orbital vehicles, technical studies related to possible avionics systems used by sub-orbital vehicles, and service allocations of those systems. The Report also addresses Question ITU-R 259/5, “Operational and radio regulatory aspects for planes operating in the upper level of the atmosphere”. | |
| ***Studies to be carried out by*:**  ITU-R | ***with the participation of*:**  ICAO, United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) |
| ***ITU‑R Study Groups concerned*:**  SG 4 and 5 | |
| ***ITU resource implications, including financial implications (refer to CV126)*:** | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks*** | |

ADD EUR/16A24/9

Draft New Resolution [EUR-G10-7] (WRC-19)

Review of the technical and regulatory conditions pertaining to the   
18.6-18.8 GHz frequency band to address possible new fixed-satellite service usage and the protection of EESS (passive)

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

considering

*a)* that the frequency band 18.6-18.8 GHz is currently allocated on a primary basis to the earth exploration-satellite (passive), fixed, mobile, fixed-satellite (space-to-Earth) services globally, as well as space research service (passive) on a primary basis in Region 2 and secondary basis in Regions 1 and 3;

*b)* that the emissions of the fixed, mobile and fixed-satellite services in the frequency band 18.6-18.8 GHz are limited to the values given in Nos. **21.5** and, in accordance with Nos. **5.522A**, **21.5A** and **21.16.2**;

*c)* that the use of the frequency band 18.6-18.8 GHz by geostationary networks and non-geostationary systems in the fixed-satellite service (space-to-Earth) operates in accordance with No. **5.522B** in the Radio Regulations;

*d)* that the power flux-density specified in No. **21.16.2** across the 200 MHz frequency band at 18.6-18.8 GHz, produced at the surface of the Earth by emissions from a space station operating in the fixed-satellite service (FSS) under assumed free-space propagation conditions, shall not exceed −95 dB(W/m2), except for less than 5% of time, when the limit may be exceeded by up to 3 dB;

*e)* that non-geostationary-satellite systems shall not cause unacceptable interference to and shall not claim protection from geostationary-satellite networks in the fixed-satellite service and the broadcasting-satellite service in accordance with No. **22.2**;

*f)* that No. **21.16** contains power flux-density limits applicable to fixed-satellite service to protect fixed and mobile services with allocations in the frequency band 18.6-18.8 GHz;

*g)* that the provisions of No. **21.17** do not apply in this frequency band,

recognizing

*a)* that the power flux-density limits on the surface of the Earth, found in Article **21**, Table **21‑4** for the 17.7-19.3 GHz frequency band apply to all types of FSS systems in the frequency band 18.6-18.8 GHz;

*b)* that possible new usage and deployments of FSS in Low Earth Orbit (LEO) and Medium Earth Orbit (MEO) orbits would require to review and the minimum apogee limit of 20 000 km currently given in No. **5.522B**;

*c)* that the frequency band 18.6-18.8 GHz is used by the Earth exploration-satellite service (EESS) (passive) in remote sensing by Earth exploration and meteorological satellites, and protection from interference is essential for passive sensing measurements and applications, especially for measurements of known spectral lines, which are of particular importance;

*d)* that cases of harmful interference experienced by EESS passive sensors in the 18.6-18.8 GHz frequency band have been reported by multiple Earth Observation missions;

*e)* that the frequency band 18.6-18.8 GHz has been extensively used by GSO FSS networks for decades which are operated in accordance with No. **21.16.2**;

*f)* that GSO FSS satellite networks referenced in *recognizing e)* and non-GSO FSS systems with apogee higher than 20 000 km already in operation, in deployment and in definition phase could have difficulty to accommodate possible new regulatory decisions,

resolves to invite ITU-R

1 to develop technical and regulatory provisions for non-GSO stations operating in the FSS (space-to-Earth) at apogees less than or equal to 20 000 km in the 18.6-18.8 GHz frequency band, including possible ESIM operation and possible transmission from non-GSO FSS space stations to GSO and non-GSO FSS space stations, taking into account *considering f)* and *recognizing a)*;

2 to conduct compatibility studies between FSS (space-to-Earth) systems and the EESS (passive) in the 18.6-18.8 GHz frequency band, covering:

i) review of the conditions, as specified in No **21.16.2** for future GSO FSS and non-GSO FSS with an orbit of apogee greater than 20 000 km, taking in particular into account *recognizing d)*;

ii) assessment of the conditions for the protection of the EESS (passive) in the 18.6-18.8 GHz frequency band from possible new usage and deployments for non-GSO FSS as referred under r*esolves* 1;

iii) consideration of the aggregate impact on EESS (passive) from all different sources of systems and stations;

iv) determination of the possible necessary regulatory conditions to be applied to future systems and stations, based on the results of i), ii) and iii);

3 to study the applicability of extending the equivalent power flux-density limits specified in Table 22-1B from 18.6 GHz up to 18.8 GHz to ensure non-GSO FSS (space-to-Earth) systems do not cause unacceptable interference into GSO FSS networks both operating in the 18.6-18.8 GHz frequency band,

further resolves

1 that unacceptable interference from non-GSO FSS networks into GSO FSS networks in the 18.6-18.8 GHz frequency band shall be avoided using equivalent power flux-density limits (e.g. Table 22-1B),

invites the 2023 World Radiocommunication Conference

to consider the results of studies and take necessary action,

invites administrations

to participate actively in the studies by submitting contributions to ITU-R.

Proposals on an agenda item for WRC-23

**Subject: Technical and regulatory conditions pertaining to the 18.6-18.8 GHz frequency band to address possible new fixed-satellite service usage and the protection of EESS (passive)**

**Origin:** CEPT

|  |  |
| --- | --- |
| ***Proposal*:**  To review the technical and regulatory conditions pertaining to the 18.6-18.8 GHz frequency band to address possible new fixed-satellite service usage and the protection of EESS (passive) in accordance with Resolution **[EUR-G10-7](WRC-19)**. | |
| ***Background/reason*:**  The frequency band 18.6-18.8 GHz has been allocated worldwide to the EESS passive as a result of WRC-2000 agenda item 1.17. This allocation was complemented by a set of various regulations, in particular Nos. **5.522A** and **5.522B** as well as relevant power limits given Nos. **21.5A** and **21.16.2** to ensure coexistence between FS/FSS and EESS (passive).  The 18.6-18.8 GHz frequency band is utilized extensively for scientific uses, particularly for weather applications. Many passive remote sensing instruments operate in this frequency band and more are planned for future deployment, it is therefore of vital interest to keep this important portion of the spectrum free of harmful interference. In particular, the 18 GHz channels are essential for all land and ocean surface data products generated from microwave imager and radiometer data, such as sea surface temperature, wind speed, water vapour, cloud liquid water, and rain rate. It is also important to note that as part of the evolution of Copernicus space component, the Copernicus Imaging Microwave Radiometry (CIMR) has been identified as High Priority Candidate Mission (HPCM). CIMR is a global multi-frequency radiometer in support of the Integrated European Union Policy for The Artic, and 18 GHz is one of the primary frequency bands selected. This frequency band will also be observed by the Microwave Imager (MWI) of the second generation of the EUMETSAT Polar System (EPS-SG). The primary objective of the MWI is to support Numerical Weather Prediction at regional and global scales by providing cloud and precipitation products and all weather surface imagery, including sea ice coverage and type, snow coverage, sea surface winds and total column water vapour above oceans.  Cases of interference experienced by EESS passive sensors in the 18.6-18.8 GHz frequency band have been reported by multiple Earth Observation missions and are being considered within ITU‑R WP 7C (see <https://www.itu.int/dms_ties/itu-r/md/15/wp7c/c/R15-WP7C-C-0344!N08!MSW-E.docx>).  In addition, the studies performed under agenda item 1.17 (WRC-2000) which led to the establishment of the current footnote No. **5.522B** considered FSS systems known at that time, i.e. GSO systems and one non-GSO satellite system planning to use this frequency band above an altitude of 20 000 km (Highly elliptical orbit (HEO)). The conditions related to the FSS use in the 18.6‑18.8 GHz frequency band as in No. **5.522B** and **21.16.2** were hence determined for GSO and HEO systems accordingly. Since there is a growing demand for Low Earth Orbit (LEO) and Medium Earth Orbit (MEO) global satellite broadband services, revisiting the studies performed in the frequency band 18.6-18.8 GHz while taking into account the latest technology developments, could help facilitate the deployment of non-GSO systems operating with an apogee below 20 000 km.  In addition, should the use of LEO and MEO satellite systems be shown as being feasible, consideration may also be given to the possibility of deploying Earth Stations in motion (ESIM) communicating with non-GSO FSS in the 18.6-18.8 GHz.  Thus, this agenda item is expected to review the technical and regulatory conditions pertaining to the 18.6-18.8 GHz and to define the appropriate conditions to ensure the protection of the EESS (passive) in the 18.6-18.8 GHz frequency band from all different sources of systems and stations, including possible new deployments for FSS (i.e. LEO and MEO, and, if appropriate, ESIM) and also possible transmission from non-GSO FSS space stations to GSO and non-GSO FSS space stations). | |
| ***Radiocommunication services concerned*:**  Earth exploration-satellite (passive) service, fixed-satellite service, mobile service, fixed service | |
| ***Indication of possible difficulties*:** | |
| ***Previous/ongoing studies on the issue*:**  Studies performed during the 1997-2000 cycle for the preparation of WRC-2000 agenda item 1.17.  Current studies within WP 7C on interference into EESS passive sensors in the frequency band 18.6-18.8 GHz. | |
| ***Studies to be carried out by*:**  ITU-R WP 4A and WP 7C | ***with the participation of*:** |
| ***ITU‑R Study Groups concerned*:**  SG 4 and 7 | |
| ***ITU resource implications, including financial implications (refer to CV126)*:**  This agenda item will be studied within the normal ITU-R procedures and associated budget. No extra cost is foreseen. | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks*** | |

ADD EUR/16A24/10

Draft New Resolution [EUR-H10-8] (WRC-19)

Use of the frequency bands 17.7-18.6 GHz (space-to-Earth), 18.8-20.2 GHz (space-to-Earth), and 27.5-30.0 GHz (Earth-to-space) by earth stations in motion communicating with non-geostationary space stations   
in the fixed-satellite service

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

considering

*a)* that the frequency bands 17.7-20.2 GHz (space-to-Earth), 27.5-30.0 GHz (Earth-to-space) are currently allocated on a primary basis to the fixed-satellite service;

*b)* that there are existing and planned non-geostationary orbit (non-GSO) satellite constellations in the frequency bands 17.7-20.2 GHz (space-to-Earth), 27.5-30.0 GHz (Earth-to-space) and that these constellations are designed to serve the growing need for access to broadband connectivity, regardless of location;

*c)* that the frequency bands listed in *considering a)* are also allocated to several other services on a primary basis, that those services are used by a variety of different systems in many administrations and that these existing services and their future development should be protected without undue constraints;

*d)* that currently there is no specific regulatory procedure for the coordination of earth stations in motion operating within non-geostationary satellite systems with regard to stations of terrestrial services;

*e)* that a consistent approach to the deployment of these earth stations in motion will support important and growing global communication requirements and provide adequate protection to other services in the frequency bands;

*f)* that the ITU Radiocommunication Sector (ITU-R) has adopted Report ITU‑R S.2261,

recognizing

*a)* that technical and operational requirements for ESIM (which were referred to as earth stations on mobile platforms (“ESOMPs”) prior to WRC-15) operating with non-GSO in the fixed-satellite service systems in the frequency bands 17.3-20.2 GHz, 27.5-29.1 GHz and 29.5-30.0 GHz have been discussed in ITU-R and are reflected in the Report ITU-R S.2261;

*b)* that Article **22** of the Radio Regulations contains equivalent power flux density (epfd) limits for non-geostationary-satellite systems in the fixed-satellite service in the 17.8-18.6 GHz, 19.7-20.2 GHz (space-to-Earth), 27.5-28.6 GHz (Earth-to-space), 29.5-30 GHz (Earth-to-space) and 17.8-18.4 GHz (inter-satellite) frequency bands;

*c)* that the use of the frequency band 29.1-29.5 GHz (Earth-to-space) by the fixed-satellite service is limited to geostationary-satellite systems and feeder links to non-geostationary satellite systems in the mobile-satellite service, and that such use is subject to the application of the provisions of No. **9.11A**, but not subject to the provisions of No. **22.2**, except as indicated in Nos. **5.523C** and **5.523E**, where such use is not subject to the provisions of No. **9.11A** and shall continue to be subject to Articles **9** (except No. **9.11A**) and **11** procedures, and to the provisions of No. **22.2** (No. **5.535A**);

*d)* that parts of the frequency band 17.7-18.1 GHz are used by feeder links for the broadcasting-satellite service, subject to Appendix **30A** (No. **5.516**)*;*

*e)* that the frequency bands 18.3-19.3 GHz (Region 2), 19.7-20.2 (all Regions), 27.5‑27.82 GHz (Region 1), 28.35-28.45 GHz (Region 2), 28.45-28.94 GHz (all Regions), 28.94‑29.1 GHz (Regions 2 and 3), 29.25-29.46 GHz (Region 2) and 29.46-30.0 GHz (all Regions) are identified for use by high-density applications in the fixed-satellite service (No. **5.516B**);

*f)* that use of the frequency band 18.1-18.4 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links of geostationary-satellite systems in the broadcasting-satellite service (No. **5.520**);

*g)* that the use of the frequency bands 17.8-18.6 GHz, 19.7-20.2 GHz, 27.5-28.6 GHz and 29.5-30.0 GHz by non-geostationary fixed-satellite service systems is subject to the application of the provisions of Nos. **5.484A**, **22.5C** and **22.5I**;

*h)* that use of the frequency bands 18.8-19.3 GHz and 28.6-29.1 GHz by geostationary and non-geostationary fixed-satellite service networks is subject to the application of the provisions of No. **9.11A**, and No. **22.2** does not apply (No. **5.523A**);

*i)* that use of the frequency band 19.3-19.7 GHz by geostationary fixed-satellite service systems and by feeder links for non-geostationary satellite systems in the mobile-satellite service is subject to the application of the provisions of No. **9.11A**, but not subject to the provisions of No. **22.2**, and that the use of this frequency band for other non-geostationary fixed-satellite service systems, or for the cases indicated in Nos. **5.523C** and **5.523E**, is not subject to the provisions of No. **9.11A** and shall continue to be subject to Articles **9** (except No. **9.11A**) and **11** procedures, and to the provisions of No. **22.2** (No. **5.523D**);

*j)* that the frequency band 27.5-30.0 GHz may be used by the fixed-satellite service (Earth-to-space) for the provision of feeder links for the broadcasting-satellite service (No. **5.539**);

*k)* that feeder links of non-geostationary networks in the mobile-satellite service and geostationary networks in the fixed-satellite service operating in the frequency band 29.1-29.5 GHz (Earth-to-space) shall employ uplink adaptive power control or other methods of fade compensation, such that the earth station transmissions shall be conducted at the power level required to meet the desired link performance while reducing the level of mutual interference between both networks (No. **5.541A**);

*l)* that the fixed and mobile services are allocated on a primary basis in the frequency bands 17.7-17.8 GHz, 18.1-19.7 GHz and 27.5-29.5 GHz on a global basis and fixed service is also primary within 17.8-18.1 GHz*;*

*m)* that the frequency band 28.5-30 GHz (Earth-to-space) is allocated to the Earth exploration-satellite service on a secondary basis, and no additional constraints should be imposed on the EESS;

*n)* that the frequency band 29.95-30 GHz may be used for space-to-space links in the Earth exploration-satellite service on a secondary basis, and no additional constraints should be imposed on the EESS;

*o)* that all allocated services in these frequency bands should be taken into account;

*p)* that earth stations in motion addressed by this Resolution are not to be used for safety-of-life applications,

resolves to invite ITU-R

1 to study the technical and operational characteristics of different types of earth stations in motion that operate or plan to operate within non-GSO FSS systems in the frequency bands 17.7‑18.6 GHz (space-to-Earth), 18.8-20.2 GHz (space-to-Earth), 27.5-30.0 GHz (space-to-Earth);

2 to study the 29.1-29.5 GHz frequency band to allow for uses of the FSS (Earth-to-space) for other uses by non-geostationary satellites other than feeder-links to the mobile-satellite service;

3 to study sharing and compatibility between earth stations in motion operating with non‑GSO FSS systems and current and planned stations of services allocated in the frequency bands 17.7-18.6 GHz (space-to-Earth), 18.8-20.2 GHz (space-to-Earth), 27.5-30.0 GHz (space-to-Earth) to ensure protection of, and not impose undue constraints on, services allocated in those frequency bands;

4 to develop technical and operational conditions and regulatory provisions for the different types earth stations in motion operation with non-GSO FSS systems taking into account the results of studies under *resolves* 1 to 3;

5 to complete studies in time for WRC‑23,

invites the 2023 World Radiocommunication Conference

to consider the results of these studies and take appropriate action.

Proposals on an agenda item for WRC-23

**Subject: Earth Stations In Motion (ESIM) communicating with non-geostationary (non-GSO) space stations in the fixed-satellite service (FSS) in the frequency bands 17.7-18.6 (space-to-Earth), 18.8-20.2 GHz (space-to-Earth), 27.5-30.0 GHz (Earth-to-space), while ensuring due protection of existing services in those frequency bands**

**Origin:** CEPT

|  |  |
| --- | --- |
| ***Proposal*:**  Study and develop technical, operational and regulatory measures, as appropriate, to facilitate the use of the frequency bands 17.7-18.6 (space-to-Earth), 18.8-20.2 GHz (space-to-Earth), 27.5-30.0 GHz (Earth-to-space) by FSS non-GSO ESIM, while ensuring due protection of existing services in those frequency bands in accordance with Resolution **[EUR-H10-8](WRC-19)**. | |
| ***Background/reason*:**  Non-GSO satellite constellations in frequency bands 17.7-20.2 GHz (space-to-Earth) and 27.5‑30 GHz (Earth-to-space) enable the provision of broadband connectivity for a variety of applications and with the added benefits of increased flexibility/security and decreased latency. More of such non-GSO systems offering broadband solutions are planned to be deployed in the near future in the same frequency bands. These constellations are designed to meet the increasing consumer demand for access to broadband connectivity, regardless of location. One area of noticeable growth for non-GSO systems is for ESIM. For example, there is growing demand for high performance connectivity for users on maritime vessels and aircraft, as well as for other applications at both ubiquitous fixed locations and while in motion. Next generation non-GSO systems will be designed to serve even smaller ESIM terminals and, as such, non-GSO systems offer the potential to rapidly expand service provision to new market segments, such as narrow body aircraft. In order to facilitate the further deployment of ubiquitous broadband connectivity to ESIM in the above mentioned frequency bands, there should be consideration on how to develop internationally harmonized technical, operational and regulatory measures. Such measures will enable and facilitate deployment of these critical and valuable service using non-GSO satellites, while making sure that no harmful interference is caused to other services. Lack of a harmonized regulatory framework will lead to uncertainty also in terms of protection criteria for others users of the frequency band, while impairing suitable deployment of these novel satellite services.  It is proposed to carry out technical sharing studies between all types of ESIM communicating with non-GSO FSS systems and other services in the frequency bands 17.7-18.6 (space-to-Earth), 18.8-20.2 GHz (space-to-Earth), 27.5-30.0 GHz (Earth-to-space), in order to develop appropriate technical, operational and regulatory measures to facilitate the operation of such earth stations, while ensuring harmful interference is not caused to other services.  This proposal does not call for the revision of the epfd limits in Article **22** of the Radio Regulations for the frequency bands of 17.8-18.6 GHz, 19.7-20.2 GHz (space-to-Earth), 27.5‑28.6 GHz, 29.5-30 GHz (Earth-to-space) and 17.8-18.4 GHz (inter-satellite).  In studying the frequencies 29.1-29.5 GHz for use by FSS non-GSO ESIMs, it is necessary to first study the technical, operational and regulatory measures necessary to allow other uses by FSS non-GSO satellite systems not limited to MSS feeder links, subject to provision No. **22.2**. | |
| ***Radiocommunication services concerned*:**  Fixed service, Mobile service, Inter-Satellite-service, Broadcasting-satellite service, mobile-satellite service, Fixed-satellite service, Space Research service, Space Research (passive) service, Earth exploration-satellite service and Earth exploration-satellite service (passive) | |
| ***Indication of possible difficulties*:**  None | |
| ***Previous/ongoing studies on the issue*:**  Technical and operational requirements for ESIM (which were referred to as earth stations on mobile platforms (“ESOMPs”) prior to WRC-15) operating with non-GSO FSS systems in the frequency bands 17.3-20.2 GHz, 27.5-29.1 GHz and 29.5-30.0 GHz have been discussed in the ITU-R and are reflected in the Report ITU-R S.2261. The Report identified the technical and operational requirements to be considered with the deployment of ESIM operating with non-GSO FSS systems in the frequency bands 17.3-19.3 GHz, 19.7-20.2 GHz, 27.0-29.1 GHz and 29.5‑30.0 GHz. The Report describes how ESIM operating in these frequency bands must be designed and operated to meet the existing technical and/or operational requirements applicable to FSS earth stations.  In addition, studies on sharing between land/maritime ESIM communicating with non-GSO FSS systems and terrestrial systems were carried out on a regional basis in CEPT and are reflected in ECC Decision ECC/DEC/(15)04. ECC Decision ECC/DEC/(15)04 is currently under revision with the addition of aeronautical ESIM. | |
| ***Studies to be carried out by*:**  ITU-R | ***with the participation of*:**  … |
| ***ITU‑R Study Groups concerned*:**  SG 4, 5 and 7 | |
| ***ITU resource implications, including financial implications (refer to CV126)*:** | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks*** | |

ADD EUR/16A24/11

Draft New Resolution [EUR-I10-9] (WRC-19)

Study of technical, operational issues, and regulatory provisions for transmissions in the Earth-to-space direction in the 27.5-30 GHz and space-to-Earth direction in frequency bands 17.7-18.6 GHz and 18.8-20.2 GHz between non-geostationary satellites to other satellites in the fixed-satellite service frequency bands

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

considering

*a)* that the definition of fixed-satellite service (FSS) in No. **1.21** of the Radio Regulations includes the possibility, in some cases, of satellite-to-satellite links, which may also be operated in the inter-satellite service;

*b)* that there have been expressions of interest by some administrations of using the 27.5-30 GHz FSS Earth-to-space and space-to-Earth in frequency bands 17.7-20.2 GHz for transmissions between non-geostationary orbit (non-GSO) satellites and other FSS satellites;

*c)* that frequency bands allocated to the fixed-satellite service are used for links between earth stations and space stations, and that such links may not be operated in the inter-satellite service;

*d)* that ITU-R has begun preliminary studies on the technical and operational issues associated with the use of non-GSO satellites transmitting toward the GSO in the 27.5-30 GHz FSS frequency band, and that such studies are expected to continue in this frequency band and other frequency bands after WRC-19;

*e)* that all allocations to the fixed-satellite service include a direction indicator,

recognizing

*a)* that it is necessary to analyse the use of the FSS (Earth-to-space) band in the frequency band 27.5-30 GHz and space-to-Earth in frequency bands 17.7-20.2 GHz between FSS non-GSO satellites and GSO satellites to ensure compatibility with all allocated services in this frequency band and avoid harmful interference;

*b)* that the sharing scenario is likely to differ as the orbital characteristics of the non-GSO satellites vary;

*c)* that the use by a non-allocated space service of frequency bands allocated to another space service under No. **4.4** of the Radio Regulations, without recognition and on a non-harmful interference/non-protected basis, is being made today,

recognizing further

*a)* that the use of the frequency bands 27.5-28.6 GHz and 29.5-30 GHz by non-geostationary fixed-satellite service systems is subject to the application of the provisions of Nos. **5.484A**, **22.5C** and **22.5I**;

*b)* that use of the frequency band 28.6-29.1 GHz by geostationary and non-geostationary fixed-satellite service networks is subject to the application of the provisions of No. **9.11A**, and No. **22.2** does not apply (No. **5.523A**);

*c)* that use of the frequency band 29.1-29.5 GHz (Earth-to-space) by the fixed-satellite service is limited to geostationary-satellite systems and feeder links to non-geostationary satellite systems in the mobile-satellite service, and that such use is subject to the application of the provisions of No. **9.11A**, but not subject to the provisions of No. **22.2**, except as indicated in Nos. **5.523C** and **5.523E**, where such use is not subject to the provisions of No. **9.11A** and shall continue to be subject to Articles **9** (except No. **9.11A**) and **11** procedures, and to the provisions of No. **22.2** (No. **5.535A**);

*d)* that the frequency band 27.5-30 GHz may be used by the fixed-satellite service (Earth-to-space) for the provision of feeder links for the broadcasting-satellite service (No. **5.539**);

*e)* that feeder links of non-geostationary networks in the mobile-satellite service and geostationary networks in the fixed-satellite service operating in the frequency band 29.1-29.5 GHz (Earth-to-space) shall employ uplink adaptive power control or other methods of fade compensation, such that the earth station transmissions shall be conducted at the power level required to meet the desired link performance while reducing the level of mutual interference between both networks (No. **5.541A**);

*f)* that the fixed and mobile services are allocated on a primary basis in the frequency bands 17.7-17.8 GHz, 18.1-19.7 GHz and 27.5-29.5 GHz frequency bands on a global basis and fixed service is also primary within 17.8-18.1 GHz;

*g)* that the frequency band 28.5-29.5 GHz (Earth-to-space) is also allocated to the Earth exploration-satellite service on a secondary basis, and no additional constraints should be imposed on the EESS and the conditions of fixed-satellite service operation are described in Resolution **750** **(Rev.WRC-15)**;

*h)* that the frequency band 29.5-30 GHz (Earth-to-space) is also allocated to the mobile-satellite service on a primary basis in 29.5-30 GHz in Region 2, on a primary basis in 29.9-30 GHz in Regions 1 and 3, and on a secondary basis in Regions 1 and 3 in 29.5-29.9 GHz;

*i)* that parts of the frequency band 17.7-18.1 GHz are used by feeder links for the broadcasting-satellite service, subject to Appendix **30A** (No. **5.516**);

*j)* that use of the frequency band 18.1-18.4 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links of geostationary-satellite systems in the broadcasting-satellite service (No. **5.520**);

*k)* that the frequency band 18.6-18.8 GHz is used by the Earth exploration-satellite service (EESS) (passive) in remote sensing by Earth exploration and meteorological satellites, and protection from interference is essential for passive sensing measurements and applications, especially for measurements of known spectral lines, which are of particular importance;

*l)* that all allocated services in these frequency bands should be taken into account,

noting

*a)* that preliminary ITU-R studies have identified factors to be considered in assessing the compatibility of non-geostationary satellite to-geostationary FSS satellite links in the Earth-to-space direction with existing services in the 27.5-30 GHz frequency band;

*b)* that further development of these studies may identify and define the cases in which transmissions in the Earth-to-space direction from non-GSO satellites in the 27.5-30 GHz and space-to-Earth in frequency bands 17.7-20.2 GHz to other FSS satellites can be made without causing unacceptable or harmful interference to existing services,

resolves to invite ITU-R

1 to study the technical and operational characteristics and user requirements of different types of non-GSO space stations that plan transmissions in the general Earth-to-space direction in the frequency band 27.5-30 GHz and space-to-Earth in frequency bands 17.7-18.6 GHz and 18.8-20.2 GHz to GSO and non-GSO FSS space stations;

2 to study sharing and compatibility between non-GSO space stations transmitting in the general Earth-to-space direction in the 27.5-30 GHz frequency bands and space-to-Earth in frequency bands 17.7-18.6 GHz and 18.8-20.2 GHz to GSO and non-GSO FSS space stations and current and planned stations of the FSS and other existing services allocated in same frequency bands, to ensure protection of, and not impose undue constraints on, other FSS operations and other services allocated in those frequency bands and taking into account *recognizing further* *a)* to *l)*;

3 to develop, for different types of non-GSO space stations and different portions of the frequency bands studied, technical conditions and regulatory provisions for their operation, including new or revised allocations as appropriate, taking into account the results of the studies above;

4 to complete these studies by the 2023 World Radiocommunication Conference,

invites the 2023 World Radiocommunication Conference

to consider the results of the above studies and take necessary regulatory actions, as appropriate,

invites administrations

to participate in the studies and to provide input contributions.

Proposals on an agenda item for WRC-23

**Subject: Consider the results of studies on the compatibility of satellite-to-satellite links, in the Earth-to-space direction in the 27.5-30 GHz, and space-to-Earth in frequency bands 17.7-18.6 GHz and 18.8-20.2 GHz with other FSS operations and other services**

**Origin:** CEPT

|  |  |
| --- | --- |
| ***Proposal*:**  To identify the cases and conditions under which transmissions in the Earth-to-space direction in the 27.5-30 GHz and space-to-Earth in frequency bands 17.7-18.6 GHz and 18.8-20.2 GHz from non-geostationary orbit space stations to geostationary-orbit or non-geostationary orbit space stations may be accommodated on a basis other than under No. **4.4** of the Radio Regulations, taking into account the necessary protection of existing services, in accordance with Resolution **[EUR-I10-9] (WRC-19)**. | |
| ***Background/reason*:**  To provide a means for recognizing in the Radio Regulations transmissions in the Earth-to-space direction in the 27.5-30 GHz and space-to-Earth in frequency bands 17.7-18.6 GHz and 18.8-20.2 GHz from non-GSO to other space stations where conditions of avoiding interference with existing systems are met. | |
| ***Radiocommunication services concerned*:**  Broadcasting-satellite service, Earth exploration-satellite service, fixed service, fixed-satellite service, mobile service, mobile-satellite service. | |
| ***Indication of possible difficulties*:**  None foreseen | |
| ***Previous/ongoing studies on the issue*:**  Studies have been initiated in ITU-R WP 4A during the 2016-2019 ITU-R Study Cycle | |
| ***Studies to be carried out by*:**  ITU-R SG 4 | ***with the participation of*:** |
| ***ITU‑R Study Groups concerned*:**  SG 5 and 7 | |
| ***ITU resource implications, including financial implications (refer to CV126)*:**  This agenda item will be studied within the normal ITU-R procedures and associated budget. No extra cost is foreseen. | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks*** | |

ADD EUR/16A24/12

Draft New Resolution [EUR-J10-10] (WRC-19)

Protection of geostationary satellite networks in the frequency bands 7 250-7 750 MHz (space-to-Earth), 7 900-8 400 MHz (Earth-to-space), 20.2-21.2 GHz (space-to-Earth) and 30-31 GHz (Earth-to-space) from emissions of non‑geostationary satellite systems operating in the same   
frequency bands and identical directions

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

considering

*a)* that the frequency bands 7 250-7 750 MHz (space-to-Earth), 7 900-8 400 MHz (Earth-to-space), 20.2-21.2 GHz (space-to-Earth) and 30-31 GHz (Earth-to-space) are allocated on a primary basis to the fixed-satellite service (FSS);

*b)* that the frequency bands 7 250-7 375 MHz (space-to-Earth) and 7 900-8 025 MHz (Earth-to-space) are also allocated to the mobile-satellite service (MSS) on a primary basis, subject to agreement obtained under No. **9.21**;

*c)* that the frequency bands 20.2-21.2 GHz (space-to-Earth) and 30-31 GHz (Earth-to-space) are also allocated on a primary basis to the MSS;

*d)* that the frequency bands 7 450-7 550 MHz (space-to-Earth) and 8 175-8 215 MHz (Earth-to-space) are also allocated to the meteorological-satellite service on a primary basis while the bands 8 025-8 175 MHz, 8 175-8 215 MHz and 8 215-8400 MHz (space-to-Earth) are allocated to the Earth exploration-satellite service on a primary basis;

*e)* that there is a growing number of non-geostationary satellite constellations planning the use of the allocations listed in *considering a), b)* and *c)*;

*f)* that the definition of criteria to avoid unacceptable interference would benefit the co-existence between existing and future assignments to geostationary satellite networks and non-geostationary satellite systems in the allocations listed in *considering a), b)*, and *c)*;

*g)* that under No. **22.2**, non-geostationary-satellite systems shall not cause unacceptable interference to and shall not claim protection from geostationary satellite networks in the fixed-satellite service and in the broadcasting-satellite service,

recognizing

*a)* that Article **22** of the Radio Regulations does not contain any limits applying to the non-geostationary satellite systems in the allocations listed in *considering* *a), b)* and *c)*;

*b)* that the provisions of No. **22.2** do not protect the geostationary satellite systems using the mobile-satellite service allocations from non-geostationary satellite systems;

*c)* that the non-geostationary satellite systems in the frequency allocations listed in *considering a)* and *c)* are not subject to any coordination procedure,

further resolves to invite WRC-23

to review the results of these studies, including the implications of the proposed revised regulatory framework on non-geostationary satellite systems submitted to the Bureau after WRC-19, and take appropriate actions.

Proposals on an agenda item for WRC-23

**Subject: Protection of GSO operating in 7/8 and 20/30 GHz from emissions of non-GSO operating in the same frequency bands and identical directions**

**Origin:** CEPT

|  |  |
| --- | --- |
| ***Proposal*:**  Discuss and verify the existing regulatory framework for the protection of geostationary satellite networks operating in the frequency bands 7 250-7 750 MHz (space-to-Earth), 7 900-8 400 MHz (Earth-to-space), 20.2-21.2 GHz (space-to-Earth) and 30-31 GHz (Earth-to-space) from harmful interference caused by emissions of non-geostationary satellite networks operating in the fixed- and mobile-satellite service and clarify, if appropriate, the regulatory provisions to ensure the protection of geostationary satellite networks operating in those frequency bands in accordance with Resolution **[EUR-J10-10] (WRC-19)**. | |
| ***Background/reason*:**  Non-geostationary satellite networks and systems operating in the frequency bands 7 250‑7 750 MHz (space-to-Earth), 7 900-8 400 MHz (Earth-to-space), 20.2-21.2 GHz (space-to-Earth) and 30-31 GHz (Earth-to-space) currently do not require coordination with geostationary satellite networks. If an administration believes that unacceptable interference may be caused to its existing or planned geostationary systems, its comments may be communicated to the notifying administration responsible for the non-geostationary satellite network, according to RR No. **9.3**. The implementation of this provision leaves room for interpretation that protection of geostationary networks is based on a best effort basis only. RR Art. **22.2** regulates that non-geostationary satellite systems shall not cause unacceptable interference to geostationary satellite networks in the fixed-satellite and broadcasting-satellite service. There exists however no protection criteria to avoid unacceptable interference to geostationary satellite networks in the frequency bands mentioned above. Moreover, No. **22.2** does not apply to the geostationary satellite systems using the mobile-satellite service allocations.  Because of this apparent ambivalent regulatory framework, the protection of geostationary systems in these bands cannot be fully ensured.  According to the ITU-R Space Network List, in the identified frequency bands the Appendix **4** information of more than 20 non-geostationary constellations have been submitted to the BR (17 filings within the last two years with rising tendency).  It is therefore proposed to clarify the existing regulatory provisions to also ensure the protection of geostationary satellite networks operating under the FSS and MSS allocations in the frequency bands 7 250-7 750 MHz (space-to-Earth), 7 900-8 400 MHz (Earth-to-space), 20.2-21.2 GHz (space-to-Earth) and 30-31 GHz (Earth-to-space). The above regulatory provisions shall not limit or unduly constrain other incumbent services. | |
| ***Radiocommunication services concerned*:**  Fixed-satellite service, mobile-satellite service | |
| ***Indication of possible difficulties*:**  Protection of geostationary systems in the above-mentioned frequency bands may limit non-geostationary operations. | |
| ***Previous/ongoing studies on the issue*:**  The WRC-2000 and WRC-2003 study periods, the development of epfd limits in WRC-2012, WRC-2015 and WRC-2019 for several frequency bands adjacent to those ones considered in this Resolution. | |
| ***Studies to be carried out by*:**  ITU-R SG 4 | ***with the participation of*:**  … |
| ***ITU‑R Study Groups concerned*:**  ITU-R SG 4 | |
| ***ITU resource implications, including financial implications (refer to CV126)*:** | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks*** | |

ADD EUR/16A24/13

Draft New Resolution [EUR-K10-11] (WRC-19)

Review and possible revision of No. 5.484B and Resolution 155 (WRC-15) related to earth stations on board unmanned aircraft which operate with geostationary-satellite networks in the fixed-satellite service in certain   
frequency bands not subject to a Plan of Appendices 30, 30A and 30B   
for the control and non-payload communications of unmanned   
aircraft systems in non-segregated airspaces

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

considering

*a)* that the operation of unmanned aircraft systems (UAS) requires reliable control and non-payload communication (CNPC) links, in particular to relay air traffic control communications and for the remote pilot to control the flight, and that satellite networks may be used to provide these CNPC links beyond the line-of-sight;

*b)* that UAS CNPC links relate to the safe operation of UAS and have to comply with certain technical, regulatory requirements, and will operate in accordance with international standards and recommended practices (SARPs) and procedures established in accordance with the Convention on International Civil Aviation;

*c)* that CNPC links between space stations and stations on board unmanned aircraft (UA) are proposed to be operated under Resolution **155 (WRC-15)** in the primary fixed-satellite service (FSS) in frequency bands shared with other primary services, including terrestrial services, however that would not preclude the use of other available allocations to accommodate this application;

*d)* that, when issuing Resolution **155** during WRC-15, conditions were provided for operations of CNPC links without prejudging whether the International Civil Aviation Organization (ICAO) would be able to develop SARPs to ensure safe operation of UAS in non-segregated airspaces under these conditions;

*e)* that ICAO is developing the Standards and Recommended Practices to ensure the technical aspects of using FSS satellites to support UAS CNPC links;

*f)* that there is urgency to conclude on the feasibility of the use of the FSS frequency bands to support the safe implementation of UAS CNPC links in non-segregated airspace;

*g)* that ITU-R has made substantive progress on studies of technical, operational and regulatory aspects in relation to the implementation of Resolution **155 (WRC-15)**,

recognizing

*a)* that Resolution **155 (WRC-15)** *resolves to invite the 2023 World Radiocommunication Conference* to consider the results of the above studies referred to in this Resolution with a view to reviewing and, if necessary, revising this Resolution, and take necessary actions, as appropriate;

*b)* that under No. **5.484B** adopted at WRC-15, Resolution **155 (WRC-15)** shall apply in the frequency bands 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.5 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Regions 1 and 3, 19.7-20.2 GHz (space-to-Earth), and in the frequency bands 14-14.47 GHz (Earth-to-space) and 29.5-30.0 GHz (Earth-to-space);

*c)* that ICAO is responsible for defining the appropriate criteria and mitigation techniques, taking into account the safety-of-life aspects of the CNPC links, in order to operate UA under FSS in non-segregated airspace,

resolves to invite ITU-R

1 to continue and complete in time for WRC-23 relevant studies of the technical, operational, and regulatory aspects in relation to the implementation of Resolution **155 (WRC-15)**;

2 to review No. **5.484B** and Resolution **155 (WRC-15)** taking into account the results of the above studies and the progress obtained by ICAO in the completion of SARPs on the use of FSS for the UAS CNPC links in non-segregated airspace,

further resolves to invite WRC-23

to revise, if necessary, No. **5.484B** and Resolution **155 (WRC-15)** and take necessary actions, as appropriate, on the basis of the studies conducted under the *resolves to invite ITU-R* above,

instructs the Secretary-General

to bring this Resolution to the attention of the Secretary-General of ICAO.

Proposals on an agenda item for WRC-23

**Subject: Considerations towards the revision of Resolution 155 (WRC-15)**

**Origin:** CEPT

|  |  |
| --- | --- |
| ***Proposal*:**  To consider, on the basis of ITU-R studies in accordance with Resolution **[EUR-K10-11] (WRC‑19)**, appropriate regulatory actions, with a view to reviewing and, if necessary, revising Resolution **155 (WRC-15)** and No. **5.484B**. | |
| ***Background/reason*:**  Resolution **155 (WRC-15)** was developed by WRC-15 for earth stations on board unmanned aircraft which operate with geostationary-satellite networks in the frequency bands 10.95‑11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 11.7-12.2 GHz (space-to-Earth) in Region 2, 12.2-12.5 GHz (space-to-Earth) in Region 3, 12.5-12.75 GHz (space-to-Earth) in Regions 1 and 3 and 19.7-20.2 GHz (space-to-Earth), and in the frequency bands 14-14.47 GHz (Earth-to-space) and 29.5-30.0 GHz (Earth-to-space) allocated to the fixed-satellite service not subject to Appendices **30**, **30A** and **30B** for the control and non-payload communications of unmanned aircraft systems (UAS) in non-segregated airspaces.  Resolution **155 (WRC-15)** is pointing in its resolves part to some specific issues to be taken into account for communication between any earth station on-board an unmanned aircraft and a space station of a geostationary-satellite network of the fixed-satellite service. Especially since the content of required international aeronautical standards and recommended practices (SARPs) still need to be developed, it was resolved to invite WRC-23 to consider the results of those studies with a view to reviewing and, if necessary, revising Resolution **155 (WRC-15)**, and take necessary actions, as appropriate.  Furthermore WRC-15 resolved further to invite WRC-23 to consider the results of the studies referred to in Resolution **155 (WRC-15)** with a view to reviewing and if necessary revising this Resolution as appropriate.  During the study period 2015-2019 studies in response of *resolves* 4 and 5 and 16 were undertaken:  Furthermore, ICAO has developed its first package of Standards and Recommended Practices (SARPS) considering the identification of frequencies envisaged for CNPC links for Unmanned Aircraft. ICAO is currently developing its second package of SARPS, which it plans to complete by 2022, on the definition of CNPC link systems for UA operated in non-segregated airspace, including performance requirements for those using FSS networks links. Progress of SARPs would be clarified by ICAO during WRC-19. | |
| ***Radiocommunication services concerned*:**  Mobile service, fixed service and fixed-satellite service | |
| ***Indication of possible difficulties*:**  None foreseen | |
| ***Previous/ongoing studies on the issue*:**  Studies undertaken in preparation of WRC-15 AI 1.5 and studies conducted in support of the implementation of Resolution **155 (WRC-15)** undertaken in ITU-R WP 5B after WRC-15. | |
| ***Studies to be carried out by*:**  ITU-R | ***with the participation of*:** |
| ***ITU‑R Study Groups concerned*:**  SG-4 (WP 4A) and SG-5 (WP 5A, WP 5B, WP 5C) | |
| ***ITU resource implications, including financial implications (refer to CV126)*:** | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks*** | |

ADD EUR/16A24/14

Draft New Resolution [EUR-L10-12] (WRC-19)

Operation of earth stations on aircraft communicating with geostationary   
space stations in the fixed-satellite service (Earth-to-space)  
in the frequency band 12.75-13.25 GHz

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

considering

*a)* that the frequency band 12.75-13.25 GHz is currently allocated on a primary basis to the fixed (FS), mobile (MS) and fixed-satellite (FSS) (Earth-to-space) services, and on a secondary basis to the space research (deep space) (space-to-Earth) services globally;

*b)* that there is an increased need for in-flight connectivity which can be eased by allowing earth stations on aircraft to communicate with GSO space stations in the FSS in the frequency bands 12.75-13.25 GHz (Earth-to-space);

*c)* that advances in technology, including the use of tracking techniques, allow earth stations on aircraft to operate within the characteristics of fixed earth stations of the FSS;

*d)* that some administrations have already deployed, and plan to expand their use of, earth stations on aircraft communicating with operational and planned GSO space stations in the FSS;

*e)* that the use of the frequency band 12.75-13.25 GHz for Earth-to-space links of earth stations on aircraft operating to GSO FSS satellite networks will contribute as an additional use of the spectrum and enhance broadband communications for aircraft passengers;

*f)* that there are many existing geostationary (GSO) FSS networks operating in this frequency band subject to Appendix **30B** (No. **5.441**);

*g)* that the use of the frequency band 12.75-13.25 GHz by earth stations on aircraft shall not result in any changes or restrictions to the existing Plan allotments and List assignments made under Appendix **30B**,

recognizing

*a)* that the technical characteristics of earth stations on aircraft communicating with a GSO space station in the FSS should comply with Appendix **30B** and with the coordination agreements reached between administrations;

*b)* that the current usage and future development of the existing services in the frequency band should be protected without imposing additional constraints on them from earth stations on aircraft;

*c)* that a globally harmonized frequency use by earth stations on aircraft would benefit the administrations as well as both aviation and satellite industries;

*d)* that earth stations on aircraft addressed by this Resolution are not to be used or relied upon for safety-of-life applications;

*e)* that the procedure for the introduction of new systems to the List of Appendix **30B** in the frequency band is stipulated in Article 6 of Appendix **30B**,

resolves to invite ITU-R

1 stations on aircraft that communicate or plan to communicate with GSO space stations in the FSS in the frequency band 12.75-13.25 GHz in the Earth-to-space direction and examination of related existing regulatory provisions, if appropriate;

2 to study the sharing and compatibility issues between earth stations on aircraft communicating with GSO space stations in the FSS and current and planned stations of existing services with allocations in the frequency band 12.75-13.25 GHz;

3 to develop the technical conditions and regulatory provisions for the operation of earth stations on aircraft communicating with GSO space stations in the FSS operating in the frequency bands 12.75-13.25 GHz (Earth-to-space), considering the results of the studies outlined in *resolves to invite ITU-R* 1 and 2,

invites the 2023 World Radiocommunication Conference

to consider the results of the above studies and take necessary actions.

Proposals on an agenda item for WRC-23

**Subject: The harmonization of the frequency band 12.75-13.25 GHz for the use by earth stations on aircraft communicating with GSO space stations in the FSS**

**Origin:** CEPT

|  |  |
| --- | --- |
| ***Proposal*:**  Harmonize the global use of the frequency band 12.75-13.25 GHz by earth stations on aircraft communicating with geostationary space stations in the fixed-satellite service (Earth-to-space) as per Resolution **[EUR-L10-12](WRC-19)**. | |
| ***Background/reason*:**  This new agenda item aims at harmonizing the global use of the frequency band 12.75-13.25 GHz by earth stations on aircraft communicating with GSO space stations in the FSS for providing in‑flight connectivity (IFC). The growing demand for internet-based applications for the airline industry and passengers calls for capacity for such services. The frequency band 12.75-13.25 GHz is allocated on primary basis to the Fixed Service (FS), Fixed-Satellite Service (FSS) (Earth-to-space) and Mobile Service (MS), and on a secondary basis to the Space research (deep space) (space-to-Earth) service (SRS) in all three Regions of ITU-R. IFC is a service deployed throughout the world, therefore a globally harmonized approach within the Radio Regulations that provides the required protection to stations operation under other primary and secondary service would benefit the administrations as well as both, aviation and satellite industries.  The operation of earth stations on aircraft in the frequency band 14-14.5 GHz (Earth-to-space) shared with the FS and/or the MS in parts of the frequency band has demonstrated the feasibility of operating such satellite services without causing harmful interference to other services. Within the new harmonized regulatory framework the downlink frequency band 10.7-12.75 GHz is used by those stations on a non-interference and non-protected basis.  The intended use of spectrum by earth stations on aircraft with FS, MS and SRS, will contribute to the efficient use of spectrum and support innovation.  The use of the frequency band 12.75-13.25 GHz is subject to Appendix **30B** (No. **5.441**). The proposed harmonized use of the frequency band by earth stations on aircraft will not be in contradiction with the existing Appendix **30B** assignments nor should result in any changes to them. The earth stations on aircraft, similar to any other earth stations operating with Appendix **30B** frequency assignments, are to be operated within the service area and with the characteristics notified for typical earth stations of the GSO FSS system (i.e. within the interference envelope established for typical earth stations of the GSO FSS system). Such operation therefore will not cause interference to other allotments/assignments (Plan and List) of Appendix **30B**. | |
| ***Radiocommunication services concerned*:**  Fixed-satellite service, fixed service, space research service (deep space) | |
| ***Indication of possible difficulties*:**  None foreseen | |
| ***Previous/ongoing studies on the issue*:**  CEPT as one of the regional organizations in Region 1 conducted technical studies and successfully defined a pfd mask for a single earth station on aircraft to ensure the protection (long-term and short-term criteria) of the FS stations from the aggregated interference from earth stations on aircraft communicating with GSO and non-GSO space stations in the FSS. CEPT also examined compatibility between the use of an Appendix **30B** assignment for earth stations on aircraft and other assignments of Appendix **30B**, and found that that those stations operating under certain technical conditions would be compatible with other Appendix **30B** assignments. These studies resulted in ECC Decision ECC/DEC/(19)04 which harmonizes the use of the frequency band 12.75-13.25 GHz by earth stations on aircraft and allows for free circulation and use. | |
| ***Studies to be carried out by*:**  ITU-R SG 4 | ***with the participation of*:** |
| ***ITU‑R Study Groups concerned*:**  SG 5 and 7 | |
| ***ITU resource implications, including financial implications (refer to CV126)*:** | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks*** | |

ADD EUR/16A24/15

Draft New Resolution [EUR-M10-13] (WRC-19)

Use of the frequency band 22.55-23.15 GHz by the Earth exploration-satellite service (Earth-to-space)

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

considering

*a)* that the frequency band 25.5-27 GHz is allocated worldwide on a primary basis to the Earth exploration-satellite (EESS) (space-to-Earth);

*b)* that an EESS (Earth-to-space) allocation in the 22.55-23.15 GHz frequency range would allow its use for satellite tracking, telemetry and control (TT&C) in combination with the existing EESS (space-to-Earth) allocation referred to in *considering a)*;

*c)* that an EESS (Earth-to-space) allocation in the 23 GHz frequency range would allow for uplinks and downlinks on the same transponder, increasing efficiency and reducing satellite complexity,

recognizing

*a)* that the frequency band 22.55-23.55 GHz is allocated to the fixed, inter-satellite and mobile services;

*b)* that the frequency band 22.55-23.15 GHz is also allocated to the space research service (Earth-to-space);

*c)* that the space research (Earth-to-space) allocation in the 22.55-23.15 GHz frequency band is paired with the space research (space-to-Earth) allocation in the 25.5-27 GHz frequency band;

*d)* that the possible development of EESS (Earth-to-space) in the 22.55-23.15 GHz frequency band should not constrain the use and the development of the space research service (Earth-to-space) in this frequency band,

resolves to invite ITU R

1 to conduct sharing and compatibility studies between EESS (Earth-to-space) systems and the existing services mentioned in *recognizing* *a)* and *b*), while ensuring the protection of and not imposing undue constraints on all services and future developments of existing services, in the frequency band 22.55-23.15 GHz;

2 to complete the studies as a matter of urgency, taking into account the present use of the allocated frequency band, with a view to presenting, at the appropriate time, the technical basis for the work of WRC-23,

invites the 2023 World Radiocommunication Conference

to review the results of these studies with a view to providing a worldwide primary allocation to EESS (Earth-to-space) in the frequency band 22.55-23.15 GHz,

invites administrations

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

invites the Secretary-General

to bring this Resolution to the attention of the international and regional organizations concerned.

Proposals on an agenda item for WRC-23

**Subject: to consider a new EESS (Earth-to-space) allocation in the frequency band 22.55-23.15 GHz**

**Origin:** CEPT

|  |  |
| --- | --- |
| ***Proposal*:**  To consider a new EESS (Earth-to-space) allocation in the frequency band 22.55-23.15 GHz, in accordance with Resolution **[EUR-M10-13](WRC-19)**. | |
| ***Background/reason*:**  Similarly to what has been achieved under WRC-12 agenda item 1.11 with a primary allocation to the space research service (Earth-to-space) in the frequency band 22.55-23.15 GHz, it is proposed to investigate a possible new primary allocation to the EESS (Earth-to-space) in the same frequency band. Such an allocation would provide a companion earth-to-space allocation to the existing EESS (space-to-Earth) allocation in 25.5-27 GHz frequency band in order to provide the associated command and control links. | |
| ***Radiocommunication services concerned*:**  Earth exploration-satellite service (Earth-to-space), fixed service, inter-satellite service, mobile service, space research service (Earth-to-space) | |
| ***Indication of possible difficulties*:**  None currently identified | |
| ***Previous/ongoing studies on the issue*:**  Studies performed in relation to the WRC-12 agenda item 1.11 (allocation to the space research service (Earth-to-space) in the frequency band 22.55-23.15 GHz) may be relevant. | |
| ***Studies to be carried out by*:**  ITU-R WP 7B | ***with the participation of*:**  Administrations and Sector Members |
| ***ITU‑R Study Groups concerned*:**  SG 4, 5 and 7 | |
| ***ITU resource implications, including financial implications (refer to CV126)*:**  This agenda item will be studied within the normal ITU-R procedures and associated budget. No extra cost is foreseen. | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks*** | |

ADD EUR/16A24/16

Draft New Resolution [EUR-N10-14] (WRC-19)

Studies towards potential new allocation to the mobile satellite service (MSS) in the 2 010-2 025 MHz band

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

considering

*a)* that the number of mobile satellite systems using small satellites is growing and the spectrum demand for suitable mobile-satellite service (MSS) allocations is increasing;

*b)* that the operational characteristics of the incumbents system utilizing existing MSS allocations are going to widely constrain the intended usage for data collection scenarios;

*c)* that a preliminary assessment of the spectrum requirements for one data collection system would suggest a contiguous block of 5/10 MHz may suffice for data collection applications;

*d)* that MSS systems with specific usage require dedicated spectrum;

*e)* that data collection MSS operations, are hampered and limited by existing higher powered MSS services,

noting

*a)* the current use of the frequency band 2 010-2 025 MHz, in particular in Region 2;

*b)* the contribution of data collection satellites, delivering actionable information, to the promotion of human welfare;

*c)* there is growing commercial interest for data collection MSS applications and deployments for utilizing small satellites;

*d)* the insufficient spectrum opportunities for commercial data collection satellite systems to operate fully integrated via combined satellite-terrestrial terminals in common or adjacent frequency bands,

recognizing

*a)* that sharing of the intended data collection applications with incumbent systems is difficult;

*b)* that the frequency bands under consideration are allocated on a primary basis to the mobile service (MS) and the fixed service (FS) in Region 1 and 3;

*c)* that the existing services, in the bands considered and adjacent to, shall be protected and no undue constrains shall be placed to those services or their systems and applications,

resolves to invite ITU-R

1 to determine operational and spectrum requirements, and system characteristics of the envisaged data collection applications in the MSS;

2 to study a possible MSS allocation (Earth-to-space) for non-GSO systems of the band 2 010-2 025 MHz based on the results of sharing and compatibility studies,

further resolves to invite WRC-23

to determine, on the basis of the studies conducted under the *resolves to invite ITU-R* above, appropriate regulatory actions,

invites administrations

to participate in the studies by submitting contributions to ITU-R.

Proposals on an agenda item for WRC-23

**Subject: to consider the sharing and compatibility studies on the band 2 010-2 025 MHz to accommodate additional MSS allocations for the use and development of low power data collection systems via satellite**

**Origin:** CEPT

|  |  |
| --- | --- |
| ***Proposal*:**  To consider the spectrum requirements and governance implications of adding MSS capability to the band 2 010-2 025 MHz for low power data collection systems via satellites, in accordance with Resolution **[EUR-N10-14](WRC-19)**. | |
| ***Background/reason*:**  Systems proposing to use rapidly deployed small satellites are being hindered due to frequency crowding and a lack of available spectrum for emerging systems, especially in relation to the flourishing global data collection services (commonly referred to as DCS). These devices are mostly operating at very low power to expand the battery life and due to the very small size. This characteristic underlines the fact that the related systems are by necessity in the NGSO in low earth orbit (mostly below 1000 km). | |
| ***Radiocommunication services concerned*:**  Mobile-satellite service | |
| ***Indication of possible difficulties*:**  WRC-12 resulted in no-change for a subset of the spectrum range in question | |
| ***Previous/ongoing studies on the issue*:**  Report ITU-R M.2077 | |
| ***Studies to be carried out by*:**  ITU-R SG 4 | ***with the participation of*:** |
| ***ITU‑R Study Groups concerned*:**  SG 5 and 7 | |
| ***ITU resource implications, including financial implications (refer to CV126)*:**  Minimal | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks*** | |

ADD EUR/16A24/17

Draft New Resolution [EUR-O10-15] (WRC-19)

Sharing between stations in the fixed service and satellite services  
in the 71-76 GHz and 81-86 GHz frequency bands

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

considering

*a)* that WRC-2000 made a number of different allocation changes to the frequency bands 71-76 GHz and 81-86 GHz based on the requirements known at the time;

*b)* that the frequency bands 71-76 GHz and 81-86 GHz are allocated on a primary basis, amongst other services, to the fixed service globally;

*c)* that the frequency band 71-76 GHz is also allocated to the fixed-satellite service (space-to-Earth) and mobile-satellite service (space-to-Earth) and the frequency band 74-76 GHz is allocated to the broadcasting-satellite service;

*d)* that the frequency band 81-86 GHz is also allocated to the fixed-satellite service and mobile-satellite service (Earth-to-space);

*e)* that sharing conditions between fixed service and satellite services in the frequency bands 71-76 GHz and 81-86 GHz could not be fully developed at WRC-2000 due to lack of available information on these services at the time;

*f)* that now, nearly 20 years on, there have been a number of significant technology advances and network change requirements in the fixed service and the 71-76 GHz and 81-86 GHz frequency bands have become strategically important frequency bands for high capacity fixed service links including backhaul for future mobile networks;

*g)* that WRC-12 already addressed sharing and compatibility issues between fixed service and passive services in the frequency bands 71-76 GHz and 81-86 GHz and relevant adjacent frequency bands,

recognizing

*a)* that there is now much more information available in the ITU-R on the characteristics and deployment of fixed service systems;

*b)* that there is an increasing number of satellite filings in the 71-76 GHz and 81-86 GHz frequency bands;

*c)* that Article **21** and other provisions of the Radio Regulations currently do not have the necessary technical and regulatory provisions to protect the fixed service use in the 71-76 GHz and 81-86 GHz frequency bands;

*d)* that Resolution **750 (Rev.WRC-15)** already contains necessary provisions to protect passive services in and adjacent frequency bands from emissions of the fixed service in the frequency bands 71-76 GHz and 81-86 GHz and there is no intention to change these provisions;

*e)* that there is no intention to change the existing allocations or status of those allocations in Article **5** of the Radio Regulations for the 71-76 GHz and 81-86 GHz frequency bands,

resolves to invite ITU-R

to conduct, as a matter of urgency and in time for WRC-23, the appropriate studies to determine power flux-density (pfd) and equivalent isotropically radiated power (e.i.r.p.) limits in Article **21** for satellite services to protect the fixed service in the 71-76 GHz and 81-86 GHz frequency bands without unduly constraining satellite systems,

invites the 2023 World Radiocommunication Conference

to consider the results of studies and take necessary action,

invites administrations

to participate actively in the studies by submitting contributions to ITU-R.

ADD EUR/16A24/18

Draft New Resolution [EUR-P10-16] (WRC-19)

Conditions for the use of the 71-76 GHz and 81-86 GHz frequency bands by stations in the satellite services to ensure compatibility with passive services

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

considering

*a)* that WRC-2000 made a number of different allocation changes to the frequency bands 71-76 GHz and 81-86 GHz based on the requirements known at the time;

*b)* that the frequency band 71-76 GHz is also allocated to the fixed-satellite service (space-to-Earth) and mobile-satellite service (space-to-Earth) and 74-76 GHz is allocated to the broadcasting-satellite service;

*c)* that the frequency band 81-86 GHz is also allocated to the fixed-satellite service and mobile-satellite service (Earth-to-space);

*d)* that the frequency bands 76-77.5 GHz, 79-81 GHz and 81-86 GHz are allocated to the radio astronomy service on a primary basis;

*e)* that the frequency band 86-92 GHz is allocated to the Earth exploration-satellite (passive), the space research (passive) and the radio astronomy services and that No. **5.340** applies in this frequency band;

*f)* that compatibility conditions between satellite services in the frequency bands 71‑76 GHz and 81-86 GHz and passive services in the bands and in adjacent bands could not be fully developed at WRC-2000 due to lack of available information on satellite services at the time;

*g)* that WRC-12 already addressed sharing and compatibility issues between fixed service and passive services in the frequency bands 71-76 GHz and 81-86 GHz and relevant adjacent frequency bands;

*h)* that Resolution **750 (Rev.WRC-15)** contains no provisions to protect the Earth exploration-satellite service (passive) in the 86-92 GHz frequency band from emissions of the space services in the 81-86 GHz frequency band;

*i)* that Resolution **739** **(Rev.WRC-07)** contains no provisions to protect the radio astronomy service in adjacent frequency bands from emissions of the space services in 71‑76 GHz and 81-86 GHz,

recognizing

*a)* that there is an increasing number of satellite filings in the 71-76 GHz and 81-86 GHz frequency bands;

*b)* that Resolution **731 (Rev.WRC-12)** calls for consideration of sharing and adjacent-band compatibility between passive and active services above 71 GHz;

*c)* that Resolution **750** **(Rev.WRC-15)** already contains necessary provisions to protect passive services in and adjacent frequency bands from emissions of the fixed service in 71-76 GHz and 81‑86 GHz and there is no intention to change these provisions;

*d)* that there is no intention to change the existing allocations or status of those allocations in Article **5** of the Radio Regulations for the 71-76 GHz and 81-86 GHz frequency bands,

resolves to invite ITU‑R

to conduct the appropriate studies to determine the technical conditions for satellite services in the 81-86 GHz frequency band in order to protect the Earth exploration-satellite (passive) and the space research (passive) services in the 86-92 GHz frequency band and the radio astronomy in the frequency bands mentioned in *considering* *d)* and *e)* without unduly constraining satellite systems,

invites the 2023 World Radiocommunication Conference

to consider the results of studies and take necessary action,

invites administrations

to participate actively in the studies by submitting contributions to ITU-R.

Proposals on an agenda item for WRC-23

**Subject: to consider, based on the results of ITU R studies:**

**1 the introduction of pfd and EIRP limits in Article 21 for the frequency bands 71‑76 GHz and 81-86 GHz**

**2 the conditions for the use of the 71-76 GHz and 81-86 GHz frequency bands by stations in the satellite services to ensure sharing with the fixed service and compatibility with passive services**

**Origin:** CEPT

|  |
| --- |
| ***Proposal*:**  To consider, based on the results of ITU-R studies:  Issue 1: the introduction of pfd and EIRP limits in Article **21** for the frequency bands 71-76 GHz and 81-86 GHz in accordance with Resolution **[EUR-O10-15] (WRC-19)**,  Issue 2: the conditions for the use of the 71-76 GHz and 81-86 GHz frequency bands by stations in the satellite services to ensure sharing with the fixed service and compatibility with passive services in accordance with Resolution **[EUR-P10-16](WRC-19)**. |
| ***Background/reason*:**  The 71-76/81-86GHz frequency bands were subject to a number of different allocation changes at WRC-2000. However, the detailed sharing conditions for Article **21** were not able to be developed at the time due to a lack of available information on the different services.  Now, nearly 20 years on, there have been a number of significant technology advances and network change requirements and the 71-76/81-86GHz frequency bands have become strategically important growth bands for high capacity backhaul fixed links including for future 5G fronthaul and backhaul solutions.  Given the above and that there is now much more information available on the characteristics of fixed service systems as well as an increasing number of satellite filings in these frequency bands, it is considered appropriate and timely to develop pfd and EIRP limits for Article **21** of the Radio Regulations to address the sharing between satellite services and the fixed service in the frequency bands under consideration. Introducing such technical framework will help manage the interference environment from an international perspective and provide clarity and certainty for future development of both the fixed and satellite services in these frequency bands. It is envisaged that changes to the Radio Regulations (Article **21**) will be required including the development of power flux-density limits for satellite systems sharing with the fixed service in the frequency band 71-76 GHz.  In addition, taking into account Resolution **731 (Rev.WRC-12)**, it is expected that the studies under issue 2 would also address the compatibility between satellite services and passive services, namely Radio Astronomy in the 81-86 GHz frequency band and in adjacent frequency bands and the EESS/SRS (passive) in the adjacent 86-92 GHz frequency band.  Compatibility between the fixed service and passive services was successfully addressed in the context of WRC-12 agenda item 1.8 (with the inclusion of relevant unwanted emission levels in Resolution **750 (Rev.WRC-15)**) and there is no intention to change these provisions. |

|  |  |
| --- | --- |
| ***Radiocommunication services concerned*:**  Fixed service, fixed-satellite service, mobile-satellite service, broadcasting-satellite service, radio astronomy service, Earth exploration-satellite service (passive), space research service (passive). | |
| ***Indication of possible difficulties*:**  None | |
| ***Previous/ongoing studies on the issue*:**  The studies between passive services in band and adjacent bands to 71-76/81-86GHz frequency bands and fixed service have already been addressed under WRC-12 agenda item 1.8 leading to Report ITU-R F.2239. | |
| ***Studies to be carried out by*:**  Issue 1: ITU-R WP 5C  Issue 2: ITU-R | ***with the participation of*:**  Administrations and Sector Members. Fixed service and satellite operators |
| ***ITU‑R Study Groups concerned*:**  Issue 1: SG4 (WP 4A, WP 4C)  Issue 2: SG 7 (WP 7C, WP 7D) SG4 (WP 4A, WP 4C) | |
| ***ITU resource implications, including financial implications (refer to CV126)*:**  This agenda item will be studied within the normal ITU-R procedures and associated budget. No extra cost is foreseen. | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks*** | |

ADD EUR/16A24/19

Draft New Resolution [EUR-Q10-17] (WRC-19)

New allocations for the radiolocation service in the frequency band 231.5‑275 GHz, and new identification for radiolocation service applications of frequency bands in the range 275-700 GHz

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

considering

*a)* that millimetre and sub-millimetre wave frequencies have been recognized by the scientific communities and governmental organizations as well suited for stand-off detection of concealed objects;

*b)* that millimetre and sub-millimetre wave imaging systems will provide a significant contribute to public safety, counter-terrorism and the security of high risk/high value assets or areas;

*c)* that millimetre and sub-millimetre wave imaging systems are typically designed in two main configurations: active (radars) and receive-only (radiometers);

*d)* that active millimetre and sub-millimetre wave imaging systems require a frequency bandwidth wider than 30 GHz to achieve range resolutions in the order of one centimetre;

*e)* that receive-only millimetre and sub-millimetre wave imaging systems detect the extremely weak power that is naturally radiated by objects and require much wider frequency bandwidth than active systems to collect enough power for detection;

*f)* that globally harmonized spectrum for the millimetre and sub-millimetre wave imaging systems is required;

*g)* that the optimal frequency range for the operation of the active millimetre and sub-millimetre wave imaging systems is between 231.5 GHz and 320 GHz. In this frequency range the atmospheric absorption is relatively low;

*h)* that there are some narrower existing allocations to the radiolocation service in the frequency range 217-275 GHz in the three ITU Regions which however do not support the bandwidth required for these systems;

*i)* that for the receive-only millimetre and sub-millimetre wave imagers an identification in the range 275-700 GHz is envisaged;

*j)* that a number of frequency bands in the range 275-1 000 GHz are identified for use by passive services, such as the radio astronomy service, the Earth exploration-satellite service (passive) and the space research service (passive);

*k)* that No. **5.565** states that the use of the frequency range 275-1 000 GHz by the passive services does not preclude use of this frequency range by active services;

*l)* that administrations wishing to make available frequencies in the 275-1 000 GHz frequency range for active service applications are urged to take all practicable steps to protect these passive services from harmful interference until the date when the Table of Frequency Allocations is established for the relevant frequencies,

recognizing

that there is no service identified in the radio regulation for use by receive-only millimetre and sub-millimetre wave imaging systems,

noting

*a)* that active millimetre and sub-millimetre wave imaging systems operate at very low transmit power (a few milliwatts typically) and short ranges (up to 300 m);

*b)* that millimetre and sub-millimetre wave imaging systems may be severely affected by other power sources operating in the same frequency band;

*c)* that the technical and operational characteristics for millimetre and sub-millimetre wave imaging systems need to be defined, including protection criteria in particular for receive-only systems,

resolves to invite ITU-R

1 to study the future requirements for globally harmonized spectrum for the radiolocation service, in particular for millimetre and sub-millimetre wave imaging applications above 231.5 GHz, ; as referred to in considering a) and b);

2 to define technical and operational characteristics including required protection criteria for millimetre and sub-millimetre wave imaging systems;

3 to study sharing and compatibility of active millimetre and sub-millimetre wave imaging applications with other systems in the frequency range between 231.5 GHz and 700 GHz;

4 to study sharing and compatibility of receive-only millimetre and sub-millimetre wave imaging applications with other systems in the frequency range between 275 GHz and 700 GHz;

5 to study possible new allocations to the radiolocation service on a co-primary basis, in the frequency range between 231.5 GHz and 275 GHz, while ensuring the protection of existing services in the considered frequency bands and, as appropriate, adjacent frequency bands;

6 to study a possible identification of frequency bands in the range 275-700 GHz for use by radiolocation service applications;

7 to review studies in *resolves to invite ITU-R* 1 to 6 and elaborate regulatory measures for the possible introduction of millimetre and sub-millimetre wave imaging systems;

8 to complete studies in time for WRC-23,

invites the 2023 World Radiocommunication Conference

to review the results of these studies and take appropriate actions,

invites administrations

to participate actively in the studies by submitting contributions to ITU-R.

ADD EUR/16A24/20

Draft New Resolution [EUR-R10-18] (WRC-19)

Review of frequency allocations for EESS(passive) in the 231.5-252 GHz frequency range and consider possible adjustment according to observation requirements of passive microwave sensors

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

considering

*a)* that, within the frequency range 231.5-252 GHz, the frequency bands 235-238 GHz and 250-252 GHz are allocated to the earth observation satellite service EESS (passive) for the use of passive microwave remote sensing systems;

*b)* that these allocations were agreed at the WRC-2000, under agenda item 1.16, Resolution **723 (WRC-97)**;

*c)* that the scientific and technology developments for passive microwave sensor measurements have evolved for the last twenty years;

*d)* that it is appropriate to ensure that the frequency allocations to EESS (passive) agreed in 2000 correspond to the up-to-date observation requirements for passive microwave sensing,

recognizing

*a)* that some passive sensor systems under development plan to operate some channel(s) in the frequency range 239-248 GHz given the specific characteristics of this frequency band for ice cloud analysis;

*b)* that, as a result, it may be necessary to consider some adjustment/extension of the EESS (passive) allocations within the frequency range 231.5-252 GHz;

*c)* that the effect on the other primary services in the frequency range 231.5-252 GHz would have to be studied and, the EESS(passive) allocations possibly adjusted,

resolves to invite ITU-R

1 to review the existing primary allocations to the EESS(passive) in the frequency range 231.5-252 GHz, in order to analyse if these allocations are aligned with the spectral needs defined by more recent passive microwave sensors;

2 to identify, as appropriate, possible adjustments to the EESS (passive) allocations in the frequency range, taking into account the results under *resolves to invite ITU-R* 1 above;

3 to study the impact that any change to the EESS(passive) allocations in the frequency range 231.5-252 GHz might have on the other primary services in these frequency bands,

invites the 2023 World Radiocommunication Conference

to review the results of these studies with a view to adjust existing or adding possible new allocations, as appropriate, to EESS (passive) in the frequency range 231.5-252 GHz without unduly constraining the other primary services currently allocated in this frequency range,

invites administrations

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

instructs the Secretary-General

to bring this Resolution to the attention of the international and regional organizations concerned.

Proposals on an agenda item for WRC-23

**Subject: Consideration of specific spectrum usage of millimetre and sub-millimetre frequency ranges:**

**1 new allocations for future imaging systems in the frequency band 231.5-275 GHz, and identification of frequency bands in the frequency range 275-700 GHz**

**2 review of existing or possible new allocations for passive remote sensing systems in the 231.5-252 GHz frequency range**

**Origin:** CEPT

|  |
| --- |
| ***Proposal*:**  To address the following two issues to accommodate requirements for spectrum usage above 231.5 GHz:  Issue 1: to consider, in accordance with Resolution **[EUR-Q10-17](WRC-19)** additional spectrum allocations to the radiolocation service on a co-primary basis in the frequency band 231.5‑275 GHz and identification for radiolocation applications in frequency bands in the frequency range 275-700 GHz for millimetre and sub-millimetre wave imaging systems.  Issue 2: to review and consider possible adjustments of the existing or possible new primary frequency allocations to EESS (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 **[EUR-R10-18](WRC-19)**. |
| ***Background/reason*:**  **Issue 1: Millimetre and sub-millimetre wave imagers (Radiolocation Service)**  Millimetre and sub-millimetre wave frequencies have been recognized by the scientific communities and governmental organizations as well suited for stand-off detection of concealed objects [1][2]. The radiated energy at these frequencies has good penetration through optically opaque media such as clothing, foliage, a truck with soft top, etc. Stand-off systems working at these frequencies have the advantage to allow good cross-range resolution with reasonably small aperture size compared to microwave (used for portal-like systems). Moreover, this radiation is non-ionizing, and therefore preferable to x-rays which can be harmful for living beings.  Millimetre and sub-millimetre wave imagers are typically designed in two main configurations: active (radars) and passive (radiometers) systems. Both types of imagers require wide bandwidth operation. Active millimetre and sub-millimetre wave imagers require a bandwidth wider than 30 GHz to achieve range resolutions in the order of a few millimetres. The latter is required, for example, to detect weapons concealed under clothing. Passive imagers detect the extremely weak power that is naturally radiated by objects and require much wider bandwidth than active systems, in the order of 100 to 200 GHz, to collect enough power for detection. An optimal frequency band, selected for the operation of these technologies, is in the frequency range between 231.5 GHz and 320 GHz. In this frequency range the atmospheric absorption is reasonably low, as shown in Figure 1.  Figure 1  Atmospheric absorption at sub-THz frequency range (source: Recommendation ITU-R P.676-11, 9-2016, Attenuation by atmospheric gases)    In the frequency ranges that are considered suitable for millimetre and sub-millimetre wave imaging, or THz imaging, (231.5-320 GHz) allocations to other radio services exist (below 275 GHz) or spectrum has not been allocated yet (above 275 GHz), as shown in the Table below, extracted from the RR. |

Table

Spectrum allocation in the frequency range 217-3 000 GHz

| Allocation to services | | |
| --- | --- | --- |
| Region 1 | Region 2 | Region 3 |
| 217-226 FIXED  FIXED-SATELLITE (Earth-to-space)  MOBILE  RADIO ASTRONOMY  SPACE RESEARCH (passive) 5.562B  5.149 5.341 | | |
| 226-231.5EARTH EXPLORATION-SATELLITE (passive)  RADIO ASTRONOMY  SPACE RESEARCH (passive)  5.340 | | |
| 231.5-232FIXED  MOBILE  Radiolocation | | |
| 232-235FIXED  FIXED-SATELLITE (space-to-Earth)  MOBILE  Radiolocation | | |
| 235-238 EARTH EXPLORATION-SATELLITE (passive)  FIXED-SATELLITE (space-to-Earth)  SPACE RESEARCH (passive)  5.563A 5.563B | | |
| 238-240 FIXED  FIXED-SATELLITE (space-to-Earth)  MOBILE  RADIOLOCATION  RADIONAVIGATION  RADIONAVIGATION-SATELLITE | | |
| 240-241 FIXED  MOBILE  RADIOLOCATION | | |
| 241-248 RADIO ASTRONOMY  RADIOLOCATION  Amateur  Amateur-satellite  5.138 5.149 | | |
| 248-250 AMATEUR  AMATEUR-SATELLITE  Radio astronomy  5.149 | | |
| 250-252 EARTH EXPLORATION-SATELLITE (passive)  RADIO ASTRONOMY  SPACE RESEARCH (passive)  5.340 5.563A | | |
| 252-265 FIXED  MOBILE  MOBILE-SATELLITE (Earth-to-space)  RADIO ASTRONOMY  RADIONAVIGATION  RADIONAVIGATION-SATELLITE  5.149 5.554 | | |
| 265-275 FIXED  FIXED-SATELLITE (Earth-to-space)  MOBILE  RADIO ASTRONOMY  5.149 5.563A | | |
| 275-3 000 (Not allocated) 5.565 | | |

|  |  |
| --- | --- |
| The operation of millimetre and sub-millimetre wave imaging systems will be limited in space and time: the systems can be employed for public safety purposes during events, i.e. screening people participating in a demonstration, a concert or a sportive activity. These situations require the use of the systems in a specific location and for a limited amount of time.  Active millimetre and sub-millimetre wave imaging systems operate at very low transmit power (a few milliwatts typically) and short ranges (up to 300 m). Passive systems, as mentioned before, rely on extremely weak signals. Therefore, both kinds of imagers can be severely affected by other power sources operating at the same frequency band. In view of this, passive imagers need to be very sensitive, although the sensitivity is lower than the required for satellite passive remote sensing and therefore can withstand more interference than passive remote sensing systems. To avoid confusions, these passive imaging systems could be referred to as receive-only imaging systems.  Given this high sensitivity for interference, co-existence with other systems shall be considered in the identification of suitable spectrum for this radiolocation application in the mentioned frequency range. This is a topic for study under the proposed agenda item, together with the co-existence with other radio services in the band.  Operational benefits  Millimetre and sub-millimetre wave imaging, as a radiolocation service, can provide the following major operational benefits:  1) Detection of concealed objects such as weapons, munitions and explosives can be enhanced;  2) Detection of objects is significantly less harmful for humans compared to the X-ray technology that is currently commonly used;  3) Detection can be done from a stand-off distance which is significantly larger than for X-ray technology, which makes is less intrusive for people;  4) This technology will provide a significant contribute to public safety, counter-terrorism and the security of high risk/high value assets or areas.  The foreseen end users are, amongst others, border police, armed forces, special forces, airports, harbours and security forces.  **Issue 2: Passive microwave remote sensors (EESS(passive))**  WRC-2000 agreed, under its agenda item 1.16, on a number of allocations, including to the Earth exploration-satellite passive service, EESS (passive), above 71 GHz.  Currently there is a need to review the allocations at higher frequencies, specifically in the 231.5 ‑252 GHz frequency range, taking into account the scientific and technology developments for passive microwave sensor measurements, as is the case in Europe with the development of the Ice Cloud Imager (ICI) instrument of the second generation of the EUMETSAT Polar System (EPS-SG).  The objective of this new agenda item is to ensure that the allocations to EESS (passive) within this frequency range considered correspond to the observation requirements for satellite passive microwave sensing. For potential adjustments/extension/shifting of the EESS (passive) allocations in this frequency range, the effect on the other primary services would have to be addressed. | |
| **Recommendation**  This agenda item has a dual objective related to two different types of services operating in frequency ranges above 231.5 GHz.  **1) Radiolocation service**: The issue proposed in this agenda item is intended to address and estimate the future requirements for globally harmonized spectrum for the radiolocation service.  The agenda item will have to address the allocation and identification on a co-primary basis of a sufficiently wide frequency band, whilst also investigating regulations to guarantee coexistence with existing services in these frequency bands. It is recommended to allocate a sufficiently large frequency band in the frequency range 231.5-275 GHz to the radiolocation service on a co-primary basis for the active part of millimetre and sub-millimetre wave imagers. For this, compatibility with the existing services would have to be assessed as well as with an adjusted/extended/shifted EESS (passive) service (under issue 2 of this proposed agenda item) in case of frequency overlap.  For the active and passive millimetre and sub-millimetre wave imagers, it is recommended to identify a sufficiently large frequency band in the frequency range 275-700 GHz.  **2) Earth exploration-satellite service (passive):**  The issue proposed in this agenda item is intended to review the existing primary allocations to the EESS(passive) in the frequency range 231.5-252 GHz, to analyse if these allocations are aligned with the spectral needs defined by more recent passive microwave sensors, and to propose necessary adjustments in the Table of Frequency Allocations. An important aspect will be the study of the potential impact that any changes could have on the other primary services. | |
| ***Radiocommunication services concerned*:**  Mobile service, fixed service, amateur service, amateur-satellite service and radionavigation-satellite service | |
| ***Indication of possible difficulties*:**  Currently there is no allocation in the frequency band above 275 GHz.  There are already requests for identification in this frequency band for photonic communication (WRC-19 agenda item 1.15). | |
| ***Previous/ongoing studies on the issue*:**  To date there are no preceding studies for this topic in this frequency band for radiolocation.  Consider the analysis for EESS(passive) compatibility conducted for WRC-2000 | |
| ***Studies to be carried out by*:**  ITU-R WP 1A | ***with the participation of*:**  … |
| ***ITU‑R Study Groups concerned*:**  SG 4, 5 (WP 5C WP 5B), 7 (WP 7C) | |
| ***ITU resource implications, including financial implications (refer to CV126)*:**  This proposed agenda item will be studied within the normal ITU-R procedures and planned budget. | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks***  **Recommendation**  [1] TIPPSI THz Imaging Phenomenology Platforms for Stand-off IED Detection, EDA, 2016  [2] CONSORTIS, Concealed Object Stand-Off Real-Time Imaging for Security, EU FP7, 2017. | |

ADD EUR/16A24/21

Draft New Resolution [EUR-S10-19] (WRC-19)

Review of the amateur service and the amateur-satellite service allocations to ensure the protection of the radionavigation-satellite service (space-to-Earth) in the frequency band 1 240-1 300 MHz

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

considering

*a)* that the frequency band 1 240-1 300 MHz is allocated worldwide to the amateur service on a secondary basis;

*b)* that the amateur-satellite service (Earth-to-space) may operate in the band 1 260‑1 270 MHz under No. **5.282** of the Radio Regulations;

*c)* that the frequency band 1 240-1 300 MHz is important for the amateur community and has been used for many years for a range of applications;

*d)* that the frequency band 1 240‑1 300 MHz is also allocated worldwide to the radionavigation-satellite service (RNSS) in the space-to-Earth direction on a primary basis;

*e)* that RNSS systems using the band 1 240‑1 300 MHz are operational, or becoming operational, in various parts of the world, with the aim of supporting a wide range of new satellite positioning services, for example enhanced accuracy and position authentication,

noting

*a)* that Recommendation ITU-R M.1732 contains the characteristics of systems operating in the amateur and amateur-satellite services for use in sharing studies;

*b)* that Recommendation ITU-R M.1044 should be used as a guide in studies of the compatibility between systems operating in the amateur and amateur-satellite services and systems operating in other services;

*c)* that Recommendation ITU-R M.1787 contains the description of RNSS systems and the technical characteristics of space stations operating in the frequency band 1 240-1 300 MHz;

*d)* that Recommendation ITU-R M.1902 contains the characteristics and protection criteria for RNSS (space-to-Earth) receivers operating in the frequency band 1 240-1 300 MHz,

recognizing

*a)* that some cases of harmful interference caused by emissions in the amateur service into RNSS (space-to-Earth) receivers have occurred, and resulted in investigations and in instructions to the operator of the interfering station to cease transmissions;

*b)* that the number of RNSS receivers in the band 1 240‑1 300 MHz is currently limited in certain regions, but will increase dramatically in the near future with the ubiquitous deployment of receivers used in mass-market applications;

*c)* that according to No. **5.29** of the Radio Regulations, stations of a secondary service shall not cause harmful interference to stations of primary services to which frequencies are already assigned or to which frequencies may be assigned at a later date;

*d)* that administrations will benefit from the availability of studies and guidelines about the protection of the RNSS (space-to-Earth) by the amateur and amateur-satellite services in the frequency band 1 240‑1 300 MHz;

*e)* that some RNSS receivers in the band 1 240‑1 300 MHz may be equipped with pulse-blanking, which may facilitate sharing with certain amateur service applications;

*f)* that the amateur service in the band 1 240-1 300 MHzis currently used for amateur voice, data and image transmission in several countries in Europe and around the globe and may transmit a variety of emission types including wideband, continuous and/or high EIRP transmissions,

invites ITU-R

1 to perform the detailed review of the different systems and applications used in the amateur service and amateur-satellite service allocations within the band 1 240‑1 300 MHz;

2 taking into account the results of the above review, to conduct, in time for WRC-23, the necessary studies leading to technical, regulatory and operational recommendations to the Conference, enabling the Conference to decide on effective measures to ensure the protection of RNSS (space-to-Earth) receivers from the amateur and amateur-satellite services within the band 1 240-1 300 MHz, without considering the removal of these amateur and amateur-satellite services allocations,

resolves to invite the 2023 World Radiocommunication Conference

to consider the results of the studies and take appropriate actions.

Proposals on an agenda item for WRC-23

**Subject: to review the amateur service secondary allocation in the 1 240-1 300 MHz frequency band to ensure the protection of RNSS:**

**Origin:** CEPT

|  |  |
| --- | --- |
| ***Proposal*:**  To review the amateur service secondary allocation in the frequency band 1 240-1 300 MHz to determine if additional measures are required to ensure the protection of the radionavigation-satellite (space-to-Earth) service operating in the same frequency band, in accordance with Resolution **[EUR-S10-19](WRC-19)**. | |
| ***Background/reason*:**  In the Radio Regulations, the amateur service is currently allocated as a secondary user in the band 1 240-1 300 MHz (known as the '23 cm band' by the amateur community) and it is currently used for amateur voice, data and image transmission in several countries in Europe and around the globe. The band is also allocated on a primary basis to the Earth exploration-satellite service, the radiolocation service, the radionavigation-satellite service (RNSS) and the space research service.  RNSS systems using the band 1 240-1 300 MHz are operational, or becoming operational, in various parts of the world with the aim of supporting wide range of new satellite positioning services, for example enhanced accuracy and position authentication. Administrations wishing to support the development of these new services within their territory should consider if additional national measures are required in order to prevent potential harmful interference to specific RNSS systems, and taking into account the ubiquitous nature of the deployment of RNSS receivers. Those measures may also need to be considered between neighbouring administrations.  In addition, the case of the secondary allocation to the amateur service calls for a particular attention since cases of harmful interference have already been met, although RNSS users can claim protection from interference caused by the radio amateur transmissions and individual transmitting stations have been shut down when required. The gradual increase in the use of the 1 240‑1 300 MHz band by RNSS systems, including the E6 signals of the EU's Galileo system, and the fact that RNSS receivers are not, most of the time, in a fixed location, makes the sharing situation very challenging.  RNSS and amateur service allocations are global, and the potential interference from secondary amateur service to primary RNSS can be of an international nature. It is therefore appropriate that a WRC agenda item addresses this issue at global level. For these reasons it is proposed to review the amateur service secondary allocation in the band 1 240-1 300 MHz to ensure the protection of the radionavigation-satellite (space-to-Earth) service. | |
| ***Radiocommunication services concerned*:**  Amateur service, amateur-satellite service, radiolocation service, aeronautical radionavigation service, radionavigation-satellite (Earth-to-space), services adjacent to the band 1 240-1 300 MHz. | |
| ***Indication of possible difficulties*:**  None | |
| ***Previous/ongoing studies on the issue*:**  Study by the Joint Research Centre (JRC) of the European Union, performed in 2015. German study presented to CEPT (CPG PTA meeting) in April 2019. | |
| ***Studies to be carried out by*:**  ITU-R WP 4C | ***with the participation of*:** |
| ***ITU‑R Study Groups concerned*:**  SG4 and 5 | |
| ***ITU resource implications, including financial implications (refer to CV126)*:**  None. | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks*** | |

SUP EUR/16A24/22

RESOLUTION 161 (WRC‑15)

Studies relating to spectrum needs and possible allocation of the   
frequency band 37.5-39.5 GHz to the fixed-satellite service

**Reasons:** CEPT does not support the preliminary agenda item 2.4 as included in Resolution **810 (WRC-15)** for the agenda of WRC-23 and Resolution **161 (WRC-15)** can be suppressed.

MOD EUR/16A24/23

RESOLUTION 804 (Rev.WRC‑19)

Principles for establishing agendas for world radiocommunication conferences

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

…

ANNEX 1 TO RESOLUTION 804 (Rev.WRC‑19)

Principles for establishing agendas for WRCs

1 A conference agenda shall include:

items assigned to it by the ITU Plenipotentiary Conference;

items on which the Director of the Radiocommunication Bureau has been requested to report;

items concerning instructions to the Radio Regulations Board and the Radiocommunication Bureau regarding their activities, and concerning the review of those activities.

2 In general, a conference may include on a future conference agenda an item proposed by a group of administrations or an administration, if all the following conditions are met:

it addresses issues of a worldwide or regional character;

it is expected that changes in the Radio Regulations, including WRC Resolutions and Recommendations, may be necessary;

it is expected that required studies can be completed (e.g. that appropriate ITU‑R Recommendations will be approved) prior to that conference;

resources associated with the subject are kept within a range which is manageable for Member States and Sector Members, the Radiocommunication Bureau and ITU‑R Study Groups and Conference Preparatory Meeting (CPM).

3 Items that meet the requirements specified in section 2 of this Annex shall be included in the future conference agenda as standalone items, and shall not be included as separate issues under agenda item on which the Director of the Radiocommunication Bureau reports on the activities of the Radiocommunication Sector since WRC.

4 To the extent possible, agenda items arising from previous conferences, normally reflected in Resolutions, and which have been considered by two successive conferences, should not be considered, unless justified.

5 In addition, the issues that could be addressed through actions undertaken by a Radiocommunication Assembly, particularly those not involving amendments to the Radio Regulations should not be included in the agenda to the extent possible.

6 In developing the conference agenda, efforts should be made to:

*a)* encourage regional and interregional coordination on the subjects to be considered in the preparatory process for the WRC, in accordance with Resolution **72 (Rev.WRC‑07)** and Resolution 80 (Rev.Marrakesh, 2002) of the Plenipotentiary Conference, with a view to addressing potentially difficult issues well before a WRC;

*b)* include, to the extent possible, agenda items that are prepared within regional groups, taking into account the equal right of individual administrations to submit proposals for agenda items;

*c)* ensure that proposals are submitted with an indication of priority;

*d)* include in proposals an assessment of their financial and other resource implications (with the assistance of the Radiocommunication Bureau) to ensure that they are within the agreed budgetary limits for ITU‑R;

*e)* ensure that the objectives and scope of proposed agenda items are complete and unambiguous;

*f)* take into account the status of the ITU‑R studies related to the potential agenda items before considering them as possible candidates for future agendas;

*g)* distinguish between items intended to result in changes to the Radio Regulations and those dealing solely with the progress of studies;

*h)* arrange items on the agenda by subject to the extent possible.

*…*

**Reasons:** Agenda item 9.1 (to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article **7** of the Convention, on the activities of the Radiocommunication Sector since WRC) exists for considering of issues that do not demand changes in the Radio Regulations.

Nevertheless, this agenda item has also been used as a backdoor for issues which have not been agreed as regular agenda items. Sometimes these new issues of agenda item 9.1 are as difficult as regular agenda items of the WRC and to decide them it is necessary to make modifications to the Radio Regulations.

But according to Annex 6 of ITU-R Administrative Circular CA/226 “Results of the first session of the Conference Preparatory Meeting for WRC-19” (23 December 2015) it is not supposed to put Regulatory and procedural considerations to the CPM Report when describing issues of the agenda item 9.1.

Thus, this situation increases the workload of the Study Groups. The workload of the WRC is also increased because at the WRC it is necessary to consider each issue on a case by case basis.

It is proposed that in the next cycle such issues should be not put in the Director's Report on the activities of the Radiocommunication Sector.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \* This agenda 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. [↑](#footnote-ref-1)