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| A close up of a sign  Description automatically generated | **World Radiocommunication Conference (WRC-23) Dubai, 20 November - 15 December 2023** | |  |
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| PLENARY MEETING | | **Addendum 16 to Document 44(Add.27)-E** | |
|  | | **13 October 2023** | |
|  | | **Original: English** | |
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| Member States of the Inter-American Telecommunication Commission (CITEL) | | | |
| PROPOSALS FOR THE WORK OF THE CONFERENCE | | | |
|  | | | |
| Agenda item 10 | | | |

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

Part 16

Background

Agenda item 10 is aimed at recommending items to the Council for inclusion in the agenda for the next WRC and items for the preliminary agenda of future conferences, in accordance with Article 7 of the Convention and Resolution **804 (Rev.WRC‑19)**.

As for the World Radiocommunication Conference (Sharm el-Sheikh, 2019), on the basis of Resolution **812 (WRC‑19)** “Preliminary agenda for the 2027 World Radiocommunication Conference,” in its *resolves to give the view* clause, it indicates *“*that the following items should be included in the preliminary agenda for WRC‑27:”*.* Regarding this, subparagraph 2.2 reads “to study and develop technical, operational and regulatory measures, as appropriate, to facilitate the use of the frequency bands 37.5-39.5 GHz (space-to-Earth), 40.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) by aeronautical and maritime earth stations in motion communicating with geostationary space stations in the fixed-satellite service, in accordance with Resolution **176 (WRC‑19)**;”

Regarding the above, today there is a growing demand for broadband services that can provide high data rates to users on mobile platforms such as vessels or aircraft. Because of this, the use of frequencies in the bands Ku and Ka for providing connectivity to ESIM services shall be under pressure because of the exponential demand of users and the need to benefit from spectrum resources.

ITU‑R has tackled the issue of aeronautical and maritime earth stations in motion (ESIM) operating with GSO FSS networks in previous WRCs, which have adopted technical and regulatory systems to allow such operations. In the Radio Regulations (RR), Resolution **902 (WRC‑03)** and the relevant parts of Resolution **156 (WRC‑15)** and Resolution **169 (WRC‑19)** develop technical and regulatory rules to allow GSO FSS to communicate with ESIMs to provide broadband communications.

At present, breakthroughs in manufacturing satellites and earth station technology have led to more widespread and practicable use of ESIM. Furthermore, the rapidly increasing use of non-geostationary-satellite orbits, such as medium Earth orbits (MEO) and low Earth orbits (LEO), represents an important innovation in satellite technology boosted by enhanced satellite design, manufacturing capacities, and launching services.

Furthermore, WRC‑23 agenda item 1.16 is aimed at studying and developing technical, operational, and regulatory measures, as appropriate, to facilitate the use of some of the frequency bands between 17.7 and 30 GHz by earth stations in motion operating with non-GSO FSS networks, guaranteeing at the same time due protection to existing services in those frequency bands, in accordance with Resolution **173 (WRC‑19)**. Studies conducted in the framework of WRC‑23 agenda item 1.16 indicated that GSO and non-GSO systems can use the same frequency band to provide connectivity for ESIM.

Resolution **176 (WRC‑19)** requests studies on the use of the frequency bands 37.5-39.5 GHz (space-to-Earth), 40.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) by aeronautical and maritime earth stations in motion communicating with geostationary space stations in the fixed-satellite service.

Although Resolution **176 (WRC‑19)** was drawn up in order to study sharing and compatibility with services allocated and identified in these frequency bands for GSO FSS systems, improvements in antenna and terminal technologies have made it possible to use the frequency bands of 50/40 GHz for both GSO FSS networks and non-GSO FSS networks. Non-GSO satellite constellations in these frequency bands make it possible to provide broadband connectivity to a variety of applications and with greater flexibility and safety and lower latency. It is expected that more of these non-GSO systems shall be rolled out to meet consumers’ growing demand for access to broadband connectivity, regardless of location. One service area of notable growth for non-GSO systems is the provision of broadband connectivity to users on vessels and aircraft.

The technical and operational issues and regulatory provisions for the operation of non-GSO FSS satellite systems in these frequency bands in order to guarantee protection of GSO satellite networks have been addressed at WRC‑19 by Resolution **156 (WRC‑15)**, which has led, as a result, to a stable regulatory framework developed through the new Resolution **769 (WRC‑19)** and Resolution **770 (WRC‑19)**, as well as provisions Nos. **22.5L** and **22.5M** of the Radio Regulations.

In Resolution **811 (WRC‑19)**, the 2019 World Radiocommunication Conference (Sharm el-Sheikh, 2019) recommended the agenda for the 2023 World Radiocommunication Council (WRC‑23) to the ITU Council. Regarding this, the positions that were adopted by the various regional radiocommunication organizations with respect to the agenda will have a substantial impact on the decisions of WRC‑23. In the case of CITEL, as part of the preparatory process, the preliminary proposals (PP) shall be providing relevant information that will help to determine CITEL’s inter-American proposals (IAP), which shall broadly impact the outcomes of WRC‑23 and, as a result, will exert a substantial impact on global radiocommunications.

Proposals

CITEL Administrations support including item 2.2 (Resolution **812 (WRC‑19)**) in the agenda of WRC‑27 and broadening the scope of Resolution **176 (WRC‑19)** to facilitate the rollout of ubiquitous broadband connection of the earth stations in motion (ESIMs) in the frequency bands 37.5-39.5 GHz (space-to-Earth), 40.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space), and 50.4-51.4 GHz (Earth-to-space) for the purpose of verifying the feasibility of operating GSO and non-GSO satellites to allow and facilitate the rollout of critical services to be shared with the other services allocated and identified in said frequency bands. CITEL Administrations also support studying and developing the technical and operational measures to ensure that other services allocated in the band shall be protected.

ADD IAP/44A27A16/1

Draft New Resolution [IAP‑AI WRC‑27] (WRC‑23)

Agenda for the 2027 World Radiocommunication Conference

The World Radiocommunication Conference (Dubai, 2023)

considering

*a)* that, according to No. 118 of the ITU Convention, the general scope of the agenda of a world radiocommunication conference (WRC) should be established four to six years in advance;

*b)* Article 13 of the ITU Constitution on the competence and calendar of world radiocommunication conferences (WRCs) and Article 7 of the ITU Convention on their agendas;

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

recognizing

that the following items be included in the preliminary agenda of WRC‑27:

*a)* that this Conference has identified various subjects that require continued study at WRC‑27;

*b)* that, when drawing up the present agenda, many of the items proposed by the administrations could not be included and had to be deferred to the agendas of future conferences,

resolves

…

1.xx to study and develop technical, operational and regulatory measures, as appropriate, to facilitate the use of the frequency bands 37.5-39.5 GHz (space-to-Earth), 40.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) by aeronautical and maritime earth stations in motion communicating with geostationary and non-geostationary space stations in the fixed satellite service, while ensuring due protection of existing services in those frequency bands, in accordance with Resolution **176 (Rev.WRC‑23)**;

…

invites the ITU Council

to finalize the agenda and take the measures needed to convene WRC‑27 and to begin as quickly as possible the necessary consultations with Member States,

instructs the Director of the Radiocommunication Bureau

1 to take the necessary measures to convene the sessions of the Conference Preparatory Meeting (CPM) and draw up a report to WRC‑27;

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

instructs the Secretary-General

to forward the present Resolution to interested international and regional organizations.

**Reasons:** To study the viability of the use of the frequency bands 37.5-39.5 GHz (space-to-Earth), 40.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) by aeronautical and maritime earth stations in motion communicating with geostationary or non-geostationary space stations in the fixed-satellite service, and in any case, define the regulatory and technical considerations to promote its use.

MOD IAP/44A27A16/2

RESOLUTION 176 (REV.WRC‑23)

Use of the frequency bands 37.5-39.5 GHz (space-to-Earth), 40.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz   
(Earth-to-space) by aeronautical and maritime earth stations in motion communicating with geostationary and non-geostationary space stations in the fixed-satellite service

The World Radiocommunication Conference (Dubai, 2023),

considering

*a)* that the frequency bands 37.5-39.5 GHz (space-to-Earth), 39.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) are globally allocated on a primary basis to the fixed-satellite service (FSS) and that existing regulatory and technical procedures between geostationary-satellite (GSO) FSS networks and non-geostationary (non-GSO) FSS system are applicable in those frequency bands;

*b)* that there is an increasing need for mobile communications, including global broadband satellite services, and that some of this need can be met by allowing aeronautical and maritime earth stations in motion (ESIMs) to communicate with FSS space stations operating in the frequency bands 37.5-40.5 GHz (space-to-Earth), 40.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space);

*c)* that in the FSS, there are GSO networks and non-GSO systems operating and/or planned for near-term operation in the frequency bands allocated to the FSS in the frequency range 37.5‑51.4 GHz;

*d)* that some administrations have already deployed, and plan to expand their use of, ESIMs with operational and future GSO FSS networks;

*e)* that GSO FSS networks and non-GSO FSS systems in the frequency bands 37.5-39.5 GHz (space-to-Earth), 40.5‑42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) are required to be coordinated and notified in accordance with the provisions of Articles **9** and **11**;

*f)* that the frequency bands 37.5-39.5 GHz, 40.5-42.5 GHz, 47.2-50.2 GHz and 50.4‑51.4 GHz are also allocated to several other services on a primary basis, the allocated services are used by a variety of different systems in many administrations, and these existing services and their future development should be protected without undue constraints;

*g)* the need to encourage the development and implementation of new technologies in the FSS at frequencies above 30 GHz,

recognizing

*a)* that Article **21** contains power flux-density (pfd) limits for GSO and non-GSO FSS;

*b)* that Nos. **22.5L** and **22.5M** of Article **22** specify the limits applicable to a non-GSO system in the FSS in the frequency bands 37.5-39.5 GHz (space-to-Earth), 39.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) to protect the orbit of the geostationary satellites and that Resolution **769 (WRC‑19)** and Resolution **770 (WRC‑19)** are also applicable;

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

*d)* that WRC‑15 adopted No. **5.527A** and Resolution **156 (WRC‑15)** related to ESIMs;

*e)* that WRC‑19 adopted No. **5.517A** and Resolution **169 (WRC‑19)** with respect to the ESIMs communicating with GSO FSS networks in the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz;

*f)* that Resolution **173 (WRC‑19)** requests studies for the use of the frequency bands 17.7-18.6 GHz, 18.8-19.3 GHz and 19.7-20.2 GHz (space-to-Earth) and 27.5-29.1 GHz and 29.5-30 GHz (Earth-to-space) by earth stations in motion communicating with non-GSO space stations in the FSS;

*g)* that ESIMs addressed by this Resolution are not to be used for safety-of-life applications;

*h)* that the frequency bands 40.5-42 GHz (space-to-Earth) in Region 2, 47.5-47.9 GHz (space-to-Earth) in Region 1, 48.2-48.54 GHz (space-to-Earth) in Region 1, 49.44-50.2 GHz (space-to-Earth) in Region 1 and 48.2-50.2 GHz (Earth-to-space) in Region 2 are identified for use by high-density applications in the FSS (No. **5.516B**);

*i)* that the provisions of No. **5.550B** are applicable;

*j)* that the use of the frequency bands 37.5-39.5 GHz (space-to-Earth), 39.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth to space) by a non-geostationary satellite system in the FSS is subject to the application of the provisions of No. **9.12** for coordination with other GSO satellites;

*k)* that the frequency bands 37-40 GHz, 40.5-43.5 GHz are available for high-density applications in the fixed service (No. **5.547**);

*l)* that the pfd in the frequency band 42.5-43.5 GHz produced by any GSO space station in the FSS (space-to-Earth) or the broadcasting-satellite service (BSS) operating in the frequency band 42-42.5 GHz shall not exceed, at the site of any radio astronomy station, the values listed in No. **5.551I**;

*m)*that the allocation of the spectrum for the FSS in the frequency bands 42.5‑43.5 GHz and 47.2-50.2 GHz for Earth-to-space transmission is greater than that in the frequency band 37.5‑39.5 GHz for space-to-Earth transmission in order to accommodate feeder links to broadcasting satellites, and administrations are urged to take all practicable steps to reserve the frequency band 47.2-49.2 GHz for feeder links for the BSS operating in the frequency band 40.5‑42.5 GHz (No. **5.552**);

*n)*that the allocation to the fixed service in the frequency bands 47.2-47.5 GHz and 47.9‑48.2 GHz is designated for use by high-altitude platform stations, and the use of the frequency bands 47.2-47.5 GHz and 47.9‑48.2 GHz is subject to the provisions of Resolution **122 (Rev.WRC‑19)** (No. **5.552A**);

*o)*that the use of the frequency bands 47.5-47.9 GHz, 48.2-48.54 GHz and 49.44-50.2 GHz by the FSS (space-to-Earth) is limited to GSO satellites (No. **5.554A**);

*p)*that the pfd in the frequency band 48.94-49.04 GHz produced by any GSO space station in the FSS (space-to-Earth) operating in the frequency bands 48.2-48.54 GHz and 49.44-50.2 GHz shall not exceed −151.8 dB(W/m2) in any 500 kHz band at the site of any radio astronomy station (No. **5.555B**);

*q)*that, in the frequency bands 49.7-50.2 GHz, 50.4-50.9 GHz and 51.4-52.6 GHz, Resolution **750** **(Rev.WRC‑19)** applies, and Nos. **5.338A**, **5.340** and**5.340.1** apply among other provisions of the Radio Regulations;

*r)* that the fixed and mobile services are allocated on a primary basis in the frequency bands 37.5-42.5 GHz and 47.2-50.2 GHz on a global basis;

*s)* that the frequency band 37.5-38 GHz is allocated to the space research service (SRS) (deep space) in the space-to-Earth direction and the frequency band 40.0-40.5 GHz is allocated to the SRS and the Earth exploration-satellite service (EESS) in the Earth-to-space direction on a primary basis;

*t)* that the frequency bands 37.5-40.5 GHz and 38-39.5 GHz are also allocated to the EESS in the space-to-Earth direction on a secondary basis;

*u)* that the frequency band 50.2-50.4 GHz is allocated on a primary basis to the EESS (passive) and SRS (passive), which need to be adequately protected;

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

resolves to invite the ITU Radiocommunication Sector

1 to study the technical and operational characteristics of aeronautical and maritime ESIMs communicating with GSO and non-GSO space stations that plan to operate within FSS allocations in the frequency bands 37.5-39.5 GHz, 40.5‑42.5 GHz, 47.2-50.2 GHz and 50.4‑51.4 GHz;

2 to study sharing and compatibility between aeronautical and maritime ESIMs communicating with GSO and non-GSO space stations in the FSS in the frequency bands 37.5-39.5 GHz, 40.5‑42.5 GHz, 47.2‑50.2 GHz[[1]](#footnote-2)\* and 50.4-51.4 GHz\* and the stations of existing services allocated in these frequency bands and, where appropriate, in adjacent frequency bands, in order to ensure protection of, and not impose undue constraints on, those services;

3 to develop, for different types of ESIM, technical conditions and regulatory provisions for their operation, taking into account the results of the studies above;

4 to guarantee that the technical and operational measures and possible regulatory changes established in conformity with the present Resolution will not affect the relevant provisions relative to the protection of GSO networks with respect to non-GSO FSS systems,

invites the 2027 World Radiocommunication Conference

to consider the results of the above studies and take necessary actions, as appropriate, provided that the results of the studies referred to in *resolves to invite the ITU Radiocommunication Sector* are complete and agreed by the radiocommunication study groups.

**Reasons:** This Resolution will include the proposed modifications to be taking in to account for the development of the studies required during the study cycle.

SUP IAP/44A27A16/3

RESOLUTION 812 (WRC-19)

Preliminary agenda for the 2027 World Radiocommunication Conference[[2]](#footnote-3)\*

**Reasons:** This Resolution should be deleted, as WRC-23 will establish a new Resolution for the agenda items for WRC-27.

ATTACHMENT

Proposal for an additional agenda item for the use of the frequency bands 37.5-39.5 GHz (space-to-Earth), 40.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space), and 50.4-51.4 GHz (Earth-to-space) by aeronautical and maritime earth stations in motion communicating with geostationary and non-geostationary space stations in the fixed-satellite service

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| **Subject:** Proposed future WRC‑‑2027 agenda item to facilitate the use of frequency bands 37.5-39.5 GHz (space-to-Earth), 40.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space), and 50.4-51.4 GHz (Earth-to-space) by aeronautical and maritime earth stations in motion communicating with geostationary and non-geostationary space stations in the fixed-satellite service | |
| **Origin:** CITEL | |
| ***Proposal*:**  to study and develop technical, operational and regulatory measures, as appropriate, to facilitate the use of the frequency bands 37.5-39.5 GHz (space-to-Earth), 40.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) by aeronautical and maritime earth stations in motion communicating with geostationary and non-geostationary space stations in the fixed-satellite service, while ensuring due protection of existing services in those frequency bands. | |
| ***Background/reason*:**  Resolution **176 (WRC‑19)** requests studies on the use of the frequency bands 37.5-39.5 GHz (space-to-Earth), 40.5-42.5 GHz (space-to-Earth), 47.2-50.2 GHz (Earth-to-space) and 50.4-51.4 GHz (Earth-to-space) by aeronautical and maritime earth stations in motion communicating with geostationary space stations in the fixed-satellite service (FSS).  Although Resolution **176 (WRC-19)** was drawn up in order to study sharing and compatibility with services allocated and identified in these frequency bands for GSO FSS systems, improvements in antenna and terminal technologies have made it possible to use the frequency bands of 50/40 GHZ for both GSO FSS networks and non-GSO FSS networks. Non-GSO satellite constellations in these frequency bands make it possible to provide broadband connectivity to a variety of applications and with greater flexibility and safety and lower latency. It is expected that more of these non-GSO systems shall be rolled out to meet consumers’ growing demand for access to broadband connectivity, regardless of location. One service area of notable growth for non-GSO systems is the provision of broadband connectivity to users on vessels and aircraft. | |
| ***Radiocommunication services concerned*:**  Fixed, fixed-satellite service, mobile, mobile-satellite service, BSS, EESS, radio astronomy and other services | |
| ***Indication of possible difficulties*:**  [ ] | |
| ***Previous/ongoing studies on the issue*:**  [ ] | |
| ***Studies to be carried out by*:**  Working Party 4A | ***with the participation of*:** Administrations and Sector members of the ITU-R |
| ***ITU‑R study groups concerned*:**  Study Group 4 | |
| ***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/No | ***Multicountry proposal*:** Yes/No  ***Number of countries*:** |
| ***Remarks*** | |

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1. \* For the frequency bands 47.2-50.2 GHz and 50.4-51.4 GHz, sharing and compatibility studies for aeronautical ESIM should take into account all necessary steps to protect the terrestrial services to which the frequency band is allocated to. [↑](#footnote-ref-2)
2. \* The appearance of square brackets around certain frequency bands in this Resolution is understood to mean that WRC‑23 will consider and review the inclusion of these frequency bands with square brackets and decide, as appropriate. [↑](#footnote-ref-3)