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| **World Radiocommunication Conference (WRC-23) Dubai, 20 November - 15 December 2023** | A close up of a sign  Description automatically generated |
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|  | **19 August 2023** |
|  | **Original: English** |
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| Asia-Pacific Telecommunity Common Proposals | |
| Proposals for the work of the conference | |
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| Agenda item 10 | |

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

Resolution **804 (Rev.WRC-19)** - Principles for establishing agendas for world radiocommunication conferences

**Issue: WRC-27 preliminary agenda item 2.6 contained in Resolution 812 (WRC-19): space weather sensors - Resolution 657 (Rev.WRC-19**)

**Proposals**

ADD ACP/xxA25A14/1

RESOLUTION [Agenda for WRC-27] (WRC-23)

**Agenda for the 2027 world radiocommunication conference**

The World Radiocommunication Conference (Dubai, 2023),

……

*resolves*

to recommend to the Council that a WRC be held in 2027 for a maximum period of four weeks, with the following agenda:

1 on the basis of proposals from administrations, taking account of the results of WRC‑23 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 the following items and take appropriate action:

1.x regulatory provisions for space weather sensors, including a definition of space weather, designating of corresponding radiocommunication service, and possible new allocations to the designated radiocommunication service (e.g., MetAids) in the frequency ranges around 30 MHz and 38.2 MHz, *and other additional frequency bands, to be decided by WRC-23* Note in accordance with Resolution **657 (Rev.WRC‑23)**;

Note: Regarding the possibility to include other frequency bands, further consideration and coordination will be made by APT Members at WRC-23.

**MOD ACP/xxA25A14/2**

RESOLUTION 657 (REV.WRC‑23)

**Studies on possible regulatory provisions for recognition in the Radio Regulations of space weather sensors and new allocations to the corresponding radiocommunication service**

The World Radiocommunication Conference (Dubai, 2023),

*considering*

*a)* that space weather observations are important for detecting natural phenomena, mainly originating from solar activity and occurring beyond the major portion of the Earth’s atmosphere, that impact Earth’s environment and human activities;

*b)* that these observations are made from ground-based and space-based systems;

*c)* that some of the sensors operate by receiving signals of opportunity, including, but not limited to, low-level natural emissions of the Sun, Earth’s atmosphere and other celestial bodies, and therefore may suffer harmful interference at levels which could be tolerated by other radio systems;

*d)* that appropriate radio regulatory protection is needed for space weather observation systems that are used operationally in the production of forecasts and warnings of space weather events that can cause harm to important sectors of national economies, human welfare and national security;

*e)* that one example of the space weather sensors is Relative Ionospheric Opacity Meter (riometer), which is a device that measures the intensity of cosmic radio noise in the tens of MHz band and measures the absorption of radio waves that traverse the ionosphere; a riometer observes ionospheric absorption events that may cause degradation or blackout of HF radiocommunication lasting minutes to several days; this event may result in the disruption of aeronautical communications in HF through the polar region,

*considering further*

*a)* that ITU-R studies have developed possible solutions to describe appropriate recognition in the Radio Regulations, which include:

- an example of space weather definition in RR Article **1**,Sections VIII: “*space weather:* natural phenomena, mainly originating from solar activity and occurring beyond the major portion of the Earth’s atmosphere, that impact Earth’s environment and human activities”;

- designation of a subset of the meteorological aid (MetAids) service, represented as “MetAids service (space weather)”, for both the receive-only and active space weather sensors;

- introduction of a new provision in RR Article **4** to make the connection between space weather and the MetAids service, an example of which provision is “Space weather sensor systems may operate under the meteorological aids service (space weather) allocations.”;

*b)* that the inclusion of space weather sensor systems under the MetAids service should ensure that there will be no negative impact on any space weather observations currently using the radio astronomy service (RAS) allocations,

*recognizing*

*a)* that Report ITU‑R RS.2456‑0, on space weather sensor systems using radio spectrum, contains a summary of spectrum-reliant space weather sensors and identifies the most critical operational systems (hereafter referred to as operational systems);

*b)* that current provisions in RR Article **11** do not allow an administration to notify a frequency assignment to a receive-only terrestrial radio station, except for certain types of stations (see Nos. **11.2**, **11.9** and **11.12**) and that therefore no procedure for notifying receive-only MetAids (space weather) stations is provided;

*c*

*d)* that mitigation measures such as improved out-of-band filters of receive-only space weather sensors may be needed to reduce the reception of possible interference from the existing active services in adjacent frequencies;

*resolves*

that for the purpose of the ITU-R studies in *resolves to invite the ITU-R*, the following definition and designation of radiocommunication service should be used:

- For definition:

*space weather:* natural phenomena, mainly originating from solar activity and occurring beyond the major portion of the Earth’s atmosphere, that impact Earth’s environment and human activities.

- For designation of radiocommunication service:

Space weather sensor systems may operate under the meteorological aids service (*space weather*) allocations.*resolves to invite the ITU-R to conduct and complete in time for WRC‑27*

1 the sharing and compatibility studies with existing services allocated in the frequency bands 29.875 – 30.125 MHz, and 38.075 – 38.325 MHz, *and other additional frequency bands, to be decided by WRC-23* Note and not to impose additional regulatory or technical constraints on those services, and also, as appropriate, on services in adjacent bands, to determine the possibility of new allocations to the MetAids service for use by space weather sensors;

Note: Regarding the possibility to include other frequency bands, further consideration and coordination will be made by APT Members at WRC-23.

2 studies on possible regulatory provisions of the Radio Regulations to accommodate the possibility for an administration that desires to notify a receive-only space weather sensor station to be included in the Master Register,

*resolves to invite* *the first session of the Conference Preparatory Meeting for WRC‑27*

to define the date by which technical and operational characteristics needed for sharing and compatibility studies are to be available to ensure that studies referred to in *resolves to invite the ITU-R* can be completed in time for consideration at WRC‑27;

*resolves to invite* *WRC‑27*

1 to consider and take appropriate actions, based on the results of the ITU-R studies referred to in *resolves to invite the ITU-R,* such as the technical, operational and regulatory provisions for appropriate recognition of space weather sensors, including regulatory provisions indicated in *resolves* above, as well as possible new allocations of frequency bands listed in *resolves to invite the ITU-R* to the corresponding radiocommunication service for use by space weather sensors;

2 to ensure the protection of existing services to which the frequency band is allocated on a primary basis, without imposing additional regulatory or technical constraints on those services, and also, as appropriate, on services in adjacent bands,

*invites administrations*

to participate actively in the ITU-R 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 and other international and regional organizations concerned.

**Reasons:**

The WRC-27 preliminary agenda item 2.6 (space weather sensor) as included in Resolution **812 (WRC-19)** intends to follow up and progress the work under the WRC-23 agenda item 9.1, topic a).

APT Members propose to modify item 2.6 of the preliminary agenda of WRC-27 and its supporting Resolution **657 (Rev. WRC-19)** with a view to be included in the agenda of WRC-27.

APT Members are of the view that should WRC-23 agreed to include this item in the agenda of WRC-27, identification of frequency bands and necessary protection to be provided to the incumbent services need to be well studied in line with the preliminary agenda item 2.6 of Resolution **812 (WRC-19)**.

APT Members are also of the view that the supporting Resolution for this new agenda item includes, inter alia, to ensure the protection of services to which the band is allocated as well as services in adjacent bands.

The result of ITU-R studies with respect to the definition of space weather and designation of the meteorological aids service for space weather sensors are proposed to be included in modified Resolution **657 (Rev. WRC-19)** related to a new space weather agenda item for WRC-27.

See also the following table.

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| **Subject:** Proposed WRC-27 agenda item considering regulatory provisions for space weather sensors, including a definition of space weather, designating of corresponding radiocommunication service, and possible new allocations to the designated radiocommunication service (e.g., MetAids) in the frequency ranges around 30 MHz and 38.2 MHz, *and other additional frequency bands, to be decided by WRC-23* Note in accordance with Resolution **657 (Rev.WRC‑23)**  Note: same as the above Note attached to this agenda item | |
| **Origin:** Asia-Pacific Telecommunity (APT) | |
| ***Proposal*:**  to consider regulatory provisions for space weather sensors, including a definition of space weather, designating of corresponding radiocommunication service, and possible new allocations to the designated radiocommunication service (e.g., MetAids) in the frequency ranges around 30 MHz and 38.2 MHz, *and other additional frequency bands, to be decided by WRC-23* Note in accordance with Resolution **657 (Rev.WRC‑23)**;  Note: same as the above Note | |
| ***Background/reason*:**  Space weather can cause problems with radiocommunications, global navigation satellite systems, power grids, and satellites, and therefore timely detection, prediction and warnings of space weather are important to the economy, safety and security of administrations and their population. However, no frequency bands have been documented in the Radio Regulations for space weather sensor applications. For this reason, WRC-23 agenda item 9.1, topic a) and WRC-27 preliminary agenda item 2.6 were established. Under WRC-23 agenda item 9.1, topic a), ITU-R has conducted studies related to space weather sensors with a view to describing appropriate recognition and protection in the Radio Regulations. As a result, it has provided an example of space weather definition in the RR Article **1** and a possible designation of a subset of the meteorological aid service, represented as the MetAids service (space weather), under which space weather sensor systems may operate through a new provision of RR Article **4**.  This new agenda item aims to provide the regulatory basis for space weather sensors to ensure their operation, including provisions of the RR, in Articles **1** and **4**, on the definition of space weather and designation of corresponding radiocommunication service (e.g., MetAids service (space weather)) mentioned above, and the additions of new allocations to that designated service through modifications of RR Article **5**. This agenda item also considers regulatory provisions of the Radio Regulations to accommodate the possibility for an administration that desires to notify a passive space weather sensor station to be included in the Master Register.  One example of the space weather sensors is Riometer (Relative Ionospheric Opacity Meter), which is a device that measures the intensity of cosmic radio noise in the tens of MHz band and measures the absorption of radio waves that traverse the ionosphere. A riometer observes ionospheric absorption events that may cause degradation or blackout of HF radiocommunication lasting minutes to several days. This event may result in the disruption of aeronautical communications in HF through the polar region. | |
| ***Radiocommunication services concerned*:**  Meteorological aids service | |
| ***Indication of possible difficulties*:**  Sharing and compatibility studies with incumbent services | |
| ***Previous/ongoing studies on the issue*:**  In the previous study cycle of 2015-2019, Report ITU-R RS.2456-0 was developed to document technical and operational characteristics and spectrum aspects. Under WRC-23 agenda item 9.1, topic a) and WRC-27 preliminary agenda item 2.6, the studies have been conducted to respond to Resolution **657 (Rev.WRC-19)**, including:   * revision of Report ITU-R RS.2456-0 * a new ITU-R Report on receive-only space weather sensor spectrum use * a new ITU-R Report on interference criteria of receive-only space weather sensor * a new ITU-R Report on active space weather sensor spectrum requirements | |
| ***Studies to be carried out by*:**  SG7 | ***with the participation of*:**  Administrations and Sector members of the ITU-R |
| ***ITU‑R study groups concerned*:**  SG 5, SG7 | |
| ***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. As the responsible group, ITU-R WP 7C usually has meetings twice a year. | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** |
| ***Remarks*** | |