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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 6 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 6

Background

Space weather observations are becoming more and more important, in particular for the detection of solar activity events that can adversely affect national economies, human welfare and national security. Currently, space weather systems are deployed in a limited number of locations for observation on a worldwide basis with significant involvement by a large number of countries and institutions, and they operate relatively free of harmful interference. However, the environment in which these systems are operating is changing rapidly as more radio services are introduced in the Radio Regulations (RR) for various frequency bands as technology progresses. Since some of the sensors operate by receiving signals of opportunity at low level, in particular the natural emissions from the sun or Earth’s atmosphere, they can be very sensitive to harmful interference. Considering the importance of space weather systems to national economies and the safety of the world population, they should have some level of international recognition and protection in the RR.

During the WRC‑23 study cycle, administrations participating in Working Party (WP) 7C realized that space weather is not defined anywhere in the RR and that there is no link between space weather and a radiocommunication service. CITEL is of the view that there is a need to provide recognition in the RR by identifying space weather under a radiocommunication service. Otherwise, any attempt to start doing sharing studies would not be fruitful since ITU‑R sharing studies are performed between radiocommunication services. As such, CITEL considered a contribution proposing that Article **1,** Section VIIIand Article **4** of the RR be modified at WRC‑23 to provide the needed recognition to space weather system and to lay out the foundation for future compatibility and sharing studies.

A WRC‑27 agenda item is required since some decisions may require identification of new allocations to the MetAids (space weather) for space weather sensors in frequency bands currently not allocated to the MetAids. If such action were to be taken, that would require modification to the RR, which could only be done at a Conference. It would not be possible to make such changes to the RR through the existing ITU‑R framework.

Based on the results of the CPM23‑2 meeting, CITEL proposes a new agenda item and a new Resolution under WRC‑23 agenda item 10 (based on 2.6 of the preliminary agenda item for WRC‑27 as per Resolution**812** (**WRC‑19**)) to continue the work that has already been initiated during this study cycle on the issue of space weather. The Resolution supports further work on sharing and compatibility studies between space weather systems (active and receive-only) and incumbent services operating in a small set of certain frequency bands, as well as in the adjacent frequency bands. The results of these studies will be used to develop regulatory provisions to allow coexistence and to provide some level of protection for space weather systems, in particular those that are receive‑only. Resolution **657 (Rev.WRC-19)** was used as the basis in the drafting of this new Resolution.

Proposals

ADD IAP/44A27A6/1

Draft New Resolution [A10‑2027] (WRC‑23)

Agenda for the 2027 World Radiocommunication Conference

The World Radiocommunication Conference (Dubai, 2023),

…

1.x to consider regulatory provisions for appropriate recognition of space weather sensors and their protection in the Radio Regulations, taking into account the results of ITU‑R studies in accordance with Resolution **[AI‑10‑SPACE WEATHER] (WRC‑23)**;

…

**Reasons:** Proposal for a new WRC‑27 agenda item.

ADD IAP/44A27A6/2

Draft New Resolution [AI‑10‑SPACE WEATHER] (WRC‑23)

Protection of radio spectrum-reliant receive-only space weather sensors used for global prediction and warnings in certain frequency bands

The World Radiocommunication Conference (Dubai, 2023),

considering

*a)* that space weather data is important to understand the physical process to provide prediction models for space weather events and their impacts;

*b)* that the collection and exchange of space weather data are important for detecting solar activity events including solar flare, high energetic particles and its relevant consequences to the Earth’s geomagnetic and ionospheric conditions that impact services critical to the economy, safety and security of administrations and their population;

*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 spectrum-reliant 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;

*e)* that a wide variety of spectrum-reliant space weather sensors currently operate relatively free of harmful interference; however, the radio interference environment could change as a result of changes made to the Radio Regulations;

*f)* that spectrum-reliant space weather sensors may be vulnerable to interference from both terrestrial and spaceborne systems;

*g)* that, while all spectrum-reliant space weather observation systems are important, the most critical need for radio regulatory protection is for those systems that are used operationally in forecasting and warnings of space weather events that can cause harm to important sectors of national economies, human welfare and national security;

*h)* that frequency use is not consistent across the limited number of operational systems;

*i**)* that the importance of space weather radiocommunication applications has been stressed by a number of international bodies, such as the World Meteorological Organization (WMO), the Intergovernmental Panel on Climate Change (IPCC), United Nations Office for Disaster Risk Reduction (UNDRR), International Civil Aviation Organization (ICAO), United Nations Committee on the Peaceful Uses of Outer Space (UN/COPUOS), and that ITU‑R collaboration with these bodies is essential,

recalling

*a)* the Plan of Action of the World Summit on the Information Society (Geneva, 2003), on e‑environment, calling for the establishment of monitoring systems, using information and communication technologies (ICT), to forecast and monitor the impact of natural and man-made disasters, particularly in developing countries, least developed countries and small economies;

*b)* Resolution 136 (Rev. Bucharest, 2022) of the Plenipotentiary Conference, on the use of telecommunications/information and communication technologies for monitoring and management in emergency and disaster situations for early warning, prevention, mitigation and relief;

*c)* Resolution 182 (Rev. Bucharest, 2022) of the Plenipotentiary Conference, on the role of telecommunications/information and communication technologies on climate change and the protection of the environment for monitoring and management in emergency and disaster situations for early warning, prevention, mitigation and relief;

*d)* the Global Framework for Climate Services (GFCS) as identified at the Eighteenth World Meteorological Congress (Geneva, June 2019), which provides information to help society adapt to climate variability and change;

*e)* that the UNDRR and the International Science Council (ISC) identified hazards related to space weather in the initial list of the hazards for disaster risk management in 2021 under the Sendai Framework for Disaster Risk Reduction 2015-2030;

*f)* the United Nations General Assembly Resolution 76/3 of 25 October 2021, “The ‘Space2030’ Agenda: space as a driver of sustainable development”, under objective 3: Increase awareness of the risks of adverse space weather and mitigate those risks, in order to ensure increased global resilience against space weather effects, and improve the international coordination of space weather-related activities, including outreach, communication and capacity-building, as well as the establishment of an international mechanism to promote increased high-level coordination in relation to space weather and increased global resilience against space weather effects;

*g)* Amendment 78 to Annex 3 to the Convention on International Civil Aviation (the International Standards and Recommended Practices, Meteorological Service for International Air Navigation) adopted on 7 March 2018 at the 213th Session of its Council, which has introduced space weather advisory information services on space weather phenomena expected to affect aeronautical radiocommunication and radio navigation systems,

recognizing

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

*b)* 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

– the documentation of the systems used for operational space weather monitoring, prediction and warnings deployed globally;

*c)* that, while the number of systems is currently limited, the interest in and the importance of data from space weather monitoring systems is growing with time;

*d)* that a description of an active space weather sensor is provided in Resolution **[XXX SW importance] (WRC‑23)**;

*e)* that a description of a receive-only space weather sensor is provided in Resolution **[XXX SW importance] (WRC‑23)**;

*f)* that the ITU Radiocommunication Sector (ITU‑R) has a study Question ITU‑R 256/7 to study the technical and operational characteristics and the frequency requirements of space weather sensors;

*g)* that the definition of space weather is provided in No.**1.XXX** in Article **1** of the Radio Regulations;

*h)* that space weather may operate under the meteorological aids service (MetAids) as its subset in accordance with No. **4.XXX** of the Radio Regulations,

noting

*a)* 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;

*b)* that, while data products are used for forecast and warnings related to public safety, among other purposes, the provisions of Nos. **1.59** and **4.10** do not apply to spectrum-reliant space weather sensors;

*c)* that according to the United Nations Office for Outer Space Affairs (UNOOSA) society is becoming increasingly dependent on space-based systems and it is vital to understand how space weather could affect space systems and human space flight, electric power transmission, high-frequency radiocommunications, and global navigation satellite system (GNSS) signals;

*d)* that certain frequency bands used by space weather applications have unique physical characteristics, so that migration to alternative frequency bands is not possible,

resolves

that no notification of frequency assignments to a station used for space weather observation be made by administrations under the MetAids (space weather) until WRC‑27 introduces MetAids (space weather) in Article **5** of the Radio Regulations,

invites the ITU Radiocommunication Sector

1 to conduct and complete, in time for WRC‑27, sharing and compatibility studies between receive-only space weather sensor systems and incumbent systems operating in the following frequency bands, as well as in adjacent frequency bands, while not adversely impacting incumbent services:

• 29.8‑30.2 MHz and 32.2‑32.6 MHz, 38.1‑38.3 MHz;

• 608‑614 MHz; and

• 2 750‑2 850 MHz;

2 to determine appropriate technical and regulatory conditions according to the results of the studies in *invites the ITU Radiocommunication Sector* 1,

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 and other international and regional organizations concerned,

invites the 2027 World Radiocommunication Conference

to review the results of the studies under *invites the ITU Radiocommunication Sector* and to take appropriate actions, including potential allocations to the MetAids (space weather).

ANNEX

Proposal for future agenda item to consider regulatory provisions for appropriate recognition of space weather sensors and their protection in the Radio Regulations

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| **Subject:** Proposal for future agenda itemfor WRC‑27 to consider regulatory provisions for appropriate recognition of space weather sensors and their protection in the Radio Regulations. | |
| **Source:** CITEL | |
| ***Proposal*:**  To study and update, the regulatory provisions for appropriate recognition of space weather sensors and their protection in the Radio Regulations for a small set of frequencies. | |
| ***Background/reason*:**  Space weather observations are becoming more and more important, in particular for the detection of solar activity events that can adversely affect national economies, human welfare and national security. Considering the importance of space weather systems to national economies and the safety of the world population, they should have some level of international recognition and protection in the Radio Regulations.  Based on the results of the CPM23‑2 meeting, a new agenda item and a new Resolution under WRC‑23 agenda item 10 are being proposed (based on item 2.6 of the preliminary agenda for WRC‑27 as per Resolution **812** (**WRC-19**)) to continue the work that has already been initiated during this study cycle on the issue of space weather. The Resolution supports further work on sharing and compatibility studies between space weather systems (active and receive-only) and incumbent services operating in a small set of certain frequency bands, as well as in the adjacent frequency bands. The results of these studies will be used to develop regulatory provisions to allow coexistence and to provide some level of protection for space weather systems, in particular those that are receive-only. | |
| ***Radiocommunication services concerned*:**  Meteorological aids service, radio astronomy service and other services in the band and in adjacent bands. | |
| ***Indication of possible difficulties*:** | |
| ***Previous/ongoing studies on the issue*:**  Related studies have already commenced in ITU‑R WP7C. | |
| ***Studies to be carried out by*:** | ***with the participation of*:**  Administrations and Sector Members of the ITU‑R |
| ***ITU‑R study groups concerned*:**  SG 7, and SG 5 | |
| ***ITU resource implications, including financial implications (refer to CV126)*:**  Minimal, since the proposed agenda item will be studied by ITU‑R WP7C within the normal ITU‑R procedures and planned budget. | |
| ***Common regional proposal*:** Yes | ***Multicountry proposal*:** No  ***Number of countries*:** 9 |
| ***Remarks*** | |

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