|  |  |  |  |
| --- | --- | --- | --- |
| **41 MEETING OF PERMANENT**  **CONSULTATIVE COMMITTEE II:**  **RADIOCOMMUNICATIONS**  **May 22 to 26, 2023**  **Mexico City, Mexico** | | **OEA/Ser.L/XVII.4.2.41**  **CCP.II-RADIO /doc. /23**  **01 May 2023**  **Original: English** | |
|  | | | |
|  | **PROPOSALS FOR THE WORK OF THE CONFERENCE**  **AGENDA ITEM 9.1 Topic A** | |  |
|  | **(Item on the Agenda: 3.1 (SGT-3))** | |  |
|  | **(Document submitted by the administration of the United States of America)** | |  |

**Impact on the sector:**

This document supports the work of CITEL’s PCC.II Working Group for WRC under 3.1 of the agenda.

**Executive Summary:**

This contribution is a preliminary proposal in relation to WRC-23 agenda item 9.1 Topic A. The United States proposes that a No Change to the Radio Regulations should be made under Agenda item 9.1 topic A and a consequential suppression of Resolution 657 (**WRC-19**). The current Resolution 657 (**WRC-19**) lacks specificity on the application radio service, candidate frequency bands, and regulatory provisions for continued studies. Action here is consistent with action being taken under the preliminary agenda item 2.6 for WRC-27.

**UNITED STATES OF AMERICA**

**PROPOSALS FOR THE WORK OF THE CONFERENCE**

**Agenda Item 9, Topic 9.1 a)**

**Agenda Item 9, topic 9.1 a):** *In accordance with Resolution* ***657*** *(****Rev.WRC-19****), review the results of studies relating to the technical and operational characteristics, spectrum requirements and appropriate radio service designations for space weather sensors with a view to describing appropriate recognition and protection in the Radio Regulations without placing additional constraints on incumbent services;*

**Background:**

Space weather refers to the physical processes occurring in the space environment that ultimately affects human activities on Earth and in space. Space weather is influenced by the solar wind and the interplanetary magnetic field (IMF) carried by the solar wind plasma. These disturbances can result in a hazardous radiation environment for satellites and humans at high altitudes, ionospheric disturbances, geomagnetic field variations, and the aurora. These effects can in turn impact a number of services and infrastructure located on the Earth’s surface, airborne, or in Earth orbit. These disturbances are measured by sensors at various frequencies. Further, disturbances in the ionosphere and atmosphere have important impacts on radio communication, satellite navigation systems and heat the atmosphere which increases the atmospheric drag experienced by LEO satellites, including the International Space Station and earth exploration satellite service systems. Radionavigation-satellite service (RNSS) signals, which are used for a growing number of precision positioning, navigation, and timing applications, as well as for sounding the atmosphere using radio-occultation, are affected by space weather as they propagate through the ionosphere.

In response to Resolution **657 (Rev.WRC-19)**, the ITU-R has undertaken the study of the technical and operational characteristics and spectrum requirements of active and receive-only spectrum-reliant space weather sensor systems. Resolution **657 (Rev.WRC-19)** also invited the ITU-R to conduct studies with the objective of determining the appropriate radio service or services that would apply to space weather sensors. The ITU-R conducted a review of existing radiocommunications services as potential candidates under which space weather sensors can operate.

Receive-only space weather sensors enable observations through the detection of signals from natural origin as well as receiving signals of opportunity from other radiocommunication services (e.g. radionavigation-satellite service (RNSS)). All receive-only space weather observations should be operated in the same radiocommunication service, in order to allow for a consistent framework for the protection of these applications. Thus, the appropriate radiocommunication service for the receive-only usage of space weather sensors needs to have a suitable definition which can cover all of these different types of sensors and observation methodologies. While the radio astronomy service (RAS) could be an appropriate radiocommunication service for sensors observing signals from cosmic origin, its definition does not cover the observations of signals of opportunity. On the other hand, the definition of the meteorological aids service (MetAids) may be able to accommodate all space weather sensors.

Active space sensors generally emit radio pulses which are then mainly reflected by the ionosphere back to the same sensor system. The reflection in the high atmospheric layers depends on the applied frequency of the radio pulse, where the reflected signal provides information on the physical characteristics of these layers which are important for characterising impacts on RNSS and HF signals in general. Active sensor systems could also be included under the MetAids.

It should be noted that frequency selection for the sensor systems is dependent upon the scientific parameters being measured and their associated physics and includes frequency bands from 0.01 MHz to 80 GHz (see latest version of Report ITU-R RS.2456).

Resolution **657 (Rev.WRC-19)** asks for necessary sharing studies with incumbent systems operating in frequency bands used by space weather sensors. No sharing or compatibility studies were undertaken by the ITU-R.

**Proposal**:

**NOC** USA/9.1A/1

ARTICLES

**Reason**: Changes to the Radio Regulations are outside the scope of Agenda Item 9.1.

**NOC** USA/9.1A/2

APPENDICES

**Reason**: Changes to the Radio Regulations are outside the scope of Agenda Item 9.1.

**SUP** USA/9.1A/3

RESOLUTION 657 (REV.WRC-19)

Protection of radio spectrum-reliant space weather sensors used for global prediction and warnings

**Reason**: While the current version of Resolution 657 lacks specificity on the application radio service, candidate frequency bands, and regulatory provisions for continued studies, it is also associated with a preliminary agenda item for WRC-27. Action here is consistent with action being taken under the preliminary agenda item.

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