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|  | ASIA-PACIFIC TELECOMMUNITY | Document No: |
| **The 2nd Meeting of the APT Conference Preparatory Group for WRC-23 (APG23-2)** | **APG23-2/INF-04** |
| 19 – 23 April 2021, Virtual/Online Meeting | 14 March 2021 |

Chairman, DG on AI 9.1 topic a

**brief on wrc-23 agenda item 9.1 topic a**

**Agenda Item 9.1 topic a:**

*9.1 on the activities of the ITU Radiocommunication Sector since WRC 19:*

*– 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;*

**Relevant Resolutions and Responsible/Contributing ITU-R Groups**

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| Resolution **657** **(Rev.WRC-19)**Protection of radio spectrum-reliant space weather sensors used for global prediction and warnings | *resolves to invite ITU-R*1 to identify, in time for WRC-23, and based on existing and possible further ITU R studies on the technical and operational characteristics, specific space weather sensors which need to be protected by appropriate regulation, including:– to determine if receive-only space weather sensors shall be designated as applications of the Metaids service;– to determine the appropriate radiocommunication service, if any, for cases where it is determined that receive-only space weather sensors do not fall under the Metaids service;2 to conduct, in time for WRC-23, any necessary sharing studies with incumbent systems operating in frequency bands used by space weather sensors with the objective of determining potential regulatory provisions that can be provided to receive-only operational space weather sensors for their appropriate recognition in the Radio Regulations, while not placing additional constraints on incumbent services;3 to develop potential solutions to describe in the Radio Regulations in Articles **1** and **4**, and/or as a WRC resolution, if deemed appropriate, for consideration by WRC-23, space weather sensor systems and their corresponding usage, as well as protection requirements for receive-only space weather sensors;4 to conduct studies, in time for WRC 23, on the technical and operational characteristics of active space weather sensors and conduct necessary sharing studies with incumbent systems operating in frequency bands used by active space weather sensors, with the objective of determining the appropriate radiocommunication service for those sensors,*instructs the Director of the Radiocommunication Bureau*to report on the results of the ITU-R studies to WRC-23,*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. |

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| **Responsible group** | **Contributing group** |
| **WP 7C** | **WP 1B, WP 3J, WP 3K, WP 3L, WP 3M, WP4A, WP4C, WP 5A, WP 5B, WP 5C, WP5D, WP 6A, WP 7D** |

**1. Background Information**

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 X-ray, Ultraviolet (UV), high energic particles and strong solar wind generated by Coronal Mass Ejection (CME). Space weather observations are important for detecting and forecasting solar activity events that impact services critical to the economy, safety and security of administrations and their population. These observations are made from ground-based and space-based systems. 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. However, no frequency bands have been documented in any manner in the Radio Regulations for space weather sensor applications.

Agenda item 9.1 topic a was therefore established with a view to describing appropriate recognition and protection of space weather sensors in the Radio Regulations without placing additional constraints on incumbent services.

WRC-15 decided to include the issue of space weather sensor as one of the preliminary agenda items for WRC-23 (AI 2.3), which was based on a proposal from [CITEL](https://www.itu.int/dms_pub/itu-r/md/15/wrc15/c/R15-WRC15-C-0007%21A24-A10%21MSW-E.docx). At WRC-19, [CEPT](https://www.itu.int/dms_pub/itu-r/md/16/wrc19/c/R16-WRC19-C-0016%21A24%21MSW-E.docx) proposed to maintain it in the agenda for WRC-23, with some modification, while [CITEL](https://www.itu.int/dms_pub/itu-r/md/16/wrc19/c/R16-WRC19-C-0011%21A24-A3%21MSW-E.docx) proposed to postpone it to WRC-27. As a compromise, it was decided that space weather issue would appear both on the agenda for WRC-23 and on the preliminary agenda for WRC-27. WRC-23 would address mainly receive-only space weather sensors as in *resolves to invite ITU-R* 1 to 3 but also covers active space weather sensors as in *resolves to invite ITU-R* 4.

**2. Information on on-going ITU-R Study**

The responsible group in ITU-R is WP 7C.

In the previous study cycle, Report ITU-R [RS.2456-0](https://www.itu.int/pub/R-REP-RS.2456-2019) was developed, which summarizes the current status of operational space weather sensor systems. At the WP 7C meeting in September/October 2020, revisions to Report ITU-R RS.2456 was proposed and converted to [Annex 7](https://www.itu.int/dms_ties/itu-r/md/19/wp7c/c/R19-WP7C-C-0105%21N07%21MSW-E.docx) to the Chairman’s Report (Doc. [7C/105](https://www.itu.int/md/R19-WP7C-C-0105/en)).

Working documents towards ITU-R Reports on space weather sensor spectrum requirements and on space weather sensor interference criteria, respectively, are being developed. The goal of the studies on spectrum requirements is to reduce the wide ranging, inconsistent use of spectrum and concentrate operations into most important frequency bands and where compatibility with incumbent services is most likely. The purpose of interference criteria is to allow for studies to determine frequency bands where space weather sensors may operate compatibly with incumbent services, not impose restrictions on incumbent services. Their latest versions are attached to the Chairman’s Report as [Annexes 8](https://www.itu.int/dms_ties/itu-r/md/19/wp7c/c/R19-WP7C-C-0105%21N08%21MSW-E.docx) and [9](https://www.itu.int/dms_ties/itu-r/md/19/wp7c/c/R19-WP7C-C-0105%21N09%21MSW-E.docx), respectively.

A work plan for completing the work necessary for WRC-23 was developed as an attachment to the Chairman’s Report as [Annex 6](https://www.itu.int/dms_ties/itu-r/md/19/wp7c/c/R19-WP7C-C-0105%21N06%21MSW-E.docx).

**3. Position of the Regional Group**

* ASMG

Inviting ASMG administrations to follow up and support studies and make observations and proposals on the technical and operational characteristics of space weather sensors and their spectrum requirements. (as of July 2020)

* RCC

The RCC Administrations support studies to protect space weather sensors without placing additional constraints on incumbent services. (as of September 2020)

**4. Position of International Organizations**

* WMO

WMO supports ensuring the protection of space weather sensors that use radio spectrum and will contribute to the corresponding studies. (as of April 2020)

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