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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-01** |
| 19 – 23 April 2021, Virtual/Online Meeting | 14 March 2021 |

Chairman, DG on AI 1.12

**brief on wrc-23 agenda item 1.12**

(Note: *This brief was developed for information purpose only. It does not necessarily express the view of APG-23*)

**Agenda Item 1.12:**

*to conduct, and complete in time for WRC 23, studies for a possible new secondary allocation to the Earth exploration-satellite (active) service for spaceborne radar sounders within the range of frequencies around 45 MHz, taking into account the protection of incumbent services, including in adjacent bands, in accordance with Resolution* ***656 (Rev.WRC-19)****;*

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

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| Resolution**656 (Rev.WRC‑19)**  Possible secondary allocation to the Earth exploration-satellite service (active) for spaceborne radar sounders in the range of frequencies around 45 MHz | resolves to invite the 2023 World Radiocommunication Conference  to consider the results of studies on spectrum needs for a possible new secondary allocation to the Earth exploration-satellite (active) service for spaceborne radar sounders within the range of frequencies around 45 MHz, taking into account the protection of incumbent services, and take appropriate action,  invites ITU-R  to conduct studies on spectrum needs and sharing studies between the Earth exploration-satellite (active) service and the radiolocation, fixed, mobile, broadcasting, amateur and space research services in the 40-50 MHz frequency range and in adjacent bands,  invites administrations  to participate actively in the studies by submitting contributions to the ITU Radiocommunication Sector,  instructs the Secretary-General  to bring this Resolution to the attention of international and regional organizations concerned. |

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| **Responsible group** | **Contributing group** |
| **WP 7C** | **WP 3K, WP 3L, WP 3M, WP 5A,  WP 5B, WP5C, WP 6A** |

**1. Background Information**

This agenda item originated from the Member States of the Inter-American Telecommunication Commission (CITEL) who proposed to WRC-15 a new Resolution to study this issue (refer [WRC-15 Document 7 Addendum 24 Addendum 7](https://www.itu.int/dms_pub/itu-r/md/15/wrc15/c/R15-WRC15-C-0007!A24-A7!MSW-E.docx)) in time for a possible new allocation in time for WRC-23.

There is an interest among climate researchers in remote sensing in the vicinity of 40-50 MHz for remote measurements of the Earth’s subsurface providing radar maps of subsurface scattering layers with the intent of locating water/ice/deposits and examining sub-ice glacial bed surfaces using active spaceborne sensors. This information can help to understand the global thickness, inner structure, and the thermal stability of the Earth’s ice sheets as an observable parameter of Earth climate evolution. The 40-50 MHz frequency range is preferable to satisfy all requirements for spaceborne radar sounders and a bandwidth of 10 MHz is sufficient for use.

Recommendation ITU-R RS.2042 titled “Typical technical and operating characteristics for spaceborne radar sounder systems using the 40-50 MHz band” was completed during the WRC-19 study cycle. This recommendation indicates that:

* operations of spaceborne radar sounder with other primary and secondary services would be under RR No. 4.4, non-interference basis and shall not cause harmful interference to, and shall not claim protection;
* that operational limitations have been identified to allow operation under RR No. 4.4 on a non-interference basis such as operating only in either uninhabited or sparsely populated areas of the ice sheets of Greenland and Antarctica and deserts of northern Africa and the Arabian peninsula and operating the radar at night-time only from 3 a.m. to 6 a.m. locally

The Recommendation also gives the characteristics that should be employed in the spaceborne radar sounder and be used for compatibility studies. The spaceborne active sensor is expected to be carried on a low-Earth orbiting satellite at an altitude of 400 km, an inclination optimized for a sun synchronous orbit. The number of spaceborne radar sounder missions operating simultaneously is expected to remain very low; perhaps only one, or two, based on the high investment cost required.

Relevant ITU-R documents:

1. ITU-R Recommendation RS.2042-1 - “Typical technical and operating characteristics for spaceborne radar sounder systems using the 40-50 MHz band”.
2. ITU-R Report RS.2455-0 – “Preliminary results of sharing studies between a 45 MHz radar sounder and incumbent fixed, mobile, broadcasting and space research services operating in the 40-50 MHz frequency range”.
3. ITU-R Document [7C/105](https://www.itu.int/md/R19-WP7C-C-0105/en) Annex 5 – “Working document towards a preliminary draft revised Report ITU-R RS.2455-1 - Preliminary results of sharing studies between a 45 MHz radar sounder and incumbent fixed, mobile, broadcasting and space research services operating in the 40-50 MHz frequency range”

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

ITU-R Working Party (WP) 7C has responsibility for progressing this issue under agenda item 1.12.

At the September/October 2020 meeting of WP 7C several reply liaison statements were received from contributing groups containing relevant technical and operating characteristics and protection criteria for other services. A contribution proposing revisions to ITU-R Report RS.2455 was received from the United States primarily adding results from dynamic simulations of interference from spaceborne radars. WP 7C is expected to continue drafting a revision to this report based on this contribution (and any further contributions received) at the next WP 7C meeting in April 2021.

Currently there are no contentious issues in the ITU-R meetings related to this agenda item.

Link to relevant ITU-R Preparatory Studies for [WRC-23 Agenda Item 1.12](https://www.itu.int/en/ITU-R/study-groups/rcpm/Pages/wrc-23-studies.aspx).

**3. Position of the Regional Group (if available)**

* ASMG (Sep. 2020) – Inviting ASG administrations to follow and support the studies to ensure protection of existing services and not impose additional restrictions on existing services. Consider the possibility of new secondary allocation to the Earth exploration-satellite (active) service for spaceborne radar sounders.
* RCC (as of Sep. 2020) – The RCC Administrations support studies for a possible new secondary allocation to the Earth exploration-satellite (active) service within the range of frequencies around 45 MHz.

**4. Position of International Organizations (if available)**

* WMO (as of Sep. 2020) – supports completion of studies to ensure compatibility of incumbent radio services with a view of creating secondary allocation to the EESS (active) at WRC-23.
* SFCG (as of Aug. 2020) – supports the development of studies in ITU-R in order to assess the compatibility between spaceborne radar sounders and incumbent services around 45 MHz with a view of creating a secondary allocation to the EESS (active) at WRC-23.