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| **The 3rd Meeting of the APT Conference Preparatory Group for WRC-23 (APG23-3)** | **APG23-3/OUT-13** |
| 8 – 13 November 2021, Virtual/Online Meeting | 13 November 2021 |

Working Party 2

**PRELIMINARY VIEWs on WRC-23 agenda item 1.6**

**Agenda Item 1.6:**

*to consider, in accordance with Resolution 772 (WRC 19), regulatory provisions to facilitate radiocommunications for sub-orbital vehicles;*

**1. Background**

Resolution 772 (WRC-19), in preparation for WRC-23 agenda item 1.6, invites the ITU-R to study the spectrum needs for stations on board sub-orbital vehicles, any appropriate modification to the Radio Regulations, excluding any new allocations or changes to the existing allocations in RR Article 5, and to identify whether there is a need for access to additional spectrum that should be addressed after WRC-23 by a future competent conference.

WP 5B has generated a Working Document towards a Preliminary Draft New Report ITU-R M.[SUBORBITAL STUDIES] to initiate study in preparation for this agenda item, which include a chapter on spectrum needs for communications between stations on-board sub‑orbital vehicles and terrestrial/space stations. A skeleton for the draft CPM text and a work plan have been generated as well. Based on the contributions ([5B/292](http://www.itu.int/md/R19-WP5B-C-0222/en), [5B/332](http://www.itu.int/md/R19-WP5B-C-0332/en), [5B/339](http://www.itu.int/md/R19-WP5B-C-0339/en)) received during the May 2021 meeting, a merged document WD towards a PDN Report ITU-R M.[SUBORBITAL STUDIES] was developed. The structure and the analysis were agreed to be adjusted to reflect the current and future applications of suborbital vehicle based on the definition defined during the previous study cycle in Report [ITU‑R M.2477](https://www.itu.int/pub/R-REP-M/publications.aspx?lang=en&parent=R-REP-M.2477). WP 5B has also exchanged information with the contributing groups, WP 3M, WP 4A, WP 4C, and WP 7B through liaison statements.

Relevant ITU-R documents:

* ITU-R [M.1787-3](https://www.itu.int/rec/R-REC-M.1787-3-201803-I/en) General characteristics of the systems and networks of radionavigation-satellite services
* ITU-R [M.1903-1](https://www.itu.int/rec/R-REC-M.1903-1-201909-I/en) Characteristics and protection criteria for receiving earth stations in the radionavigation-satellite service (space-to-Earth) and receivers in the aeronautical radionavigation service operating in the band 1 559-1 610 MHz
* ITU-R [M.1905-1](https://www.itu.int/rec/R-REC-M.1905-1-201909-I/en) Characteristics for RNSS receivers in the frequency bands 1 164-1 215 MHz
* ITU-R [M.1038](https://www.itu.int/rec/R-REC-M.1038/en) Efficient use of the geostationary-satellite orbit and spectrum in the 1-3 GHz frequency range by mobile-satellite systems
* ITU-R[M.1184-3](https://www.itu.int/rec/R-REC-M.1184/en) Technical characteristics of mobile satellite systems in the frequency bands below 3 GHz for use in developing criteria for sharing between the mobile-satellite service and other services
* ITU-R [M.1316-1](https://www.itu.int/rec/R-REC-M.1316/en) Principles and a methodology for frequency sharing in the 1 610.6‑1 613.8 MHz and 1 660-1 660.5 MHz bands between the mobile-satellite service (Earth-to-space) and the radio astronomy service
* ITU-R [M.1471-1](https://www.itu.int/rec/R-REC-M.1471/en) Guide to the application of the methodologies to facilitate coordination and use of frequency bands shared between the mobile-satellite service and the fixed service in the frequency range 1-3 GHz

This Recommendation references applicable methodologies to access interference to fixed service receivers contained in ITU-R [M.1472-1](https://www.itu.int/rec/R-REC-M.1472/en) and   
ITU-R [M.1474-1](https://www.itu.int/rec/R-REC-M.1474/en)

* ITU-R [M.1741](https://www.itu.int/rec/R-REC-M.1741/en) Methodology for deriving performance objectives and its optimization for IP packet applications in the mobile-satellite service

Relevant ITU-R Report:

* ITU-R [M.2477-0](https://www.itu.int/pub/R-REP-M.2477-2019) Radiocommunications for suborbital vehicles

**2. Documents**

The input documents and information documents received at APG23-3 are listed as follows:

* Input Documents: APG23-3/ [INP-08(AUS)](https://www.apt.int/sites/default/files/2021/10/APG23-3-INP-08_AUS_contribution_for_WP2_Preliminary_Views_on_WRC-23_Agenda_Items_1.6_1.7_1.8_1.9_1.10_1.11_and_Res.427WRC-19.docx), [INP-25(KOR)](https://www.apt.int/sites/default/files/2021/11/APG23-3-INP-25_WP2_Kor_1.6_1.7_1.8_1.9_1.10_1.11.docx), [INP-29(J)](https://www.apt.int/sites/default/files/2021/11/APG23-3-INP-29_J-2_WP2_PRELIMINARY_VIEWS_ON_WRC-23_AGENDA_ITEMS_1.6_1.7_1.8_1.9_1.10_1.11_AND_RES.427.docx)
* Information Documents: APG23-3/ [INF-01(WMO)](https://www.apt.int/sites/default/files/2021/10/APG23-3-INF-01_Preliminary_WMO_Position_on_WRC-23_Agenda.docx), [INF-15(ICAO)](https://www.apt.int/sites/default/files/2021/10/APG23-3-INF-15_ICAO-Position_for_ITU_WRC-23.docx), [INF-20(CEPT)](https://www.apt.int/sites/default/files/2021/11/APG23-3-INF-20_Status_of_CEPT_Preparation_for_WRC-23_and_RA-23.pdf), [INF-37(ASMG)](https://www.apt.int/sites/default/files/2021/11/APG23-3-INF-37_ASMG_Preparation_for_WRC-23.pdf), [INF-28](https://www.apt.int/sites/default/files/2021/11/APG23-3-INF-28_Briefing_on_AI1.6.docx)

**3. Summary of discussions**

**3.1 Summary of APT Members’ views**

**3.1.1 Australia** - **Document APG23-3/INP-08**

* Australia supports ITU-R studies of spectrum needs for communications between stations on board sub-orbital vehicles and terrestrial/space stations and of appropriate modification, if any, to the Radio Regulations consistent with Resolution **772 (WRC-19)**.Australia notes that new allocations or changes to the existing allocations in Article **5** are excluded under this agenda item at WRC-23.

**3.1.2 Korea (Republic of)** - **Document APG23-3/INP-25**

* The Republic of Korea supports development of appropriate regulatory provisions to the Radio Regulations consistent with Resolution 772(WRC-19), incumbent services must be protected based on sharing and compatibility studies.

**3.1.3 Japan** - **Document APG23-3/INP-29**

* Japan supports ITU-R studies of spectrum needs for communications between stations on board sub-orbital vehicles and terrestrial/space stations and of appropriate modification, if any, to the Radio Regulations consistent with Resolution 772 (WRC-19).
* Japan is of the view that when studying appropriate modification to the Radio Regulations, existing services must be properly protected.

**3.2 Summary of issues raised during the meeting**

None.

**4. APT Preliminary View(s)**

APT Members support ITU-R studies of spectrum needs for communications between stations on board sub-orbital vehicles and terrestrial/space stations and of appropriate modification, if any, to the Radio Regulations consistent with Resolution **772 (WRC-19)**.

APT Members are of the view that when studying appropriate modification to the Radio Regulations, existing services should be properly protected,and new allocations or changes to the existing allocations in Radio Regulations Article **5** are excluded under this agenda item at WRC-23.

**5. Other View(s) from APT Members**

None.

**6. Issues for Consideration at Next APG Meeting**

None.

**7. Views from Other Organisations**

**7.1 Regional Groups**

**7.1.1 ASMG**

* There is no objection in developing regulatory provisions to facilitate the operation of sub-orbital vehicles, while ensuring that the current civil aviation and space launch systems are not affected.
* No change in Article 5 of the Radio Regulations.
* Follow related ITU-R studies.

**7.1.2 ATU**

* Under development.

**7.1.3 CEPT**

* CEPT is of the view that the definition of sub‐orbital flight in Report ITU‐R M.2477 “to be an intentional flight of a vehicle expected to reach the upper atmosphere with a portion of its flight path that may occur in space without completing a full orbit around the Earth before returning back to the surface of the Earth” is sufficient. CEPT supports the categorization of radiocommunication station for suborbital vehicle by the purpose of the mission:
  + Some suborbital vehicles that will have at least one phase of its their flight occurring in airspace shared with other aircraft, should use onboard terrestrial stations or/and Earth stations operated in the same radiocommunication services as the ones for conventional aircraft independently of the maximum altitude reached.
  + Other types of the suborbital vehicles that fly in non-shared airspace, may use onboard terrestrial stations or/and Earth stations operated in relevant radiocommunication service to allow the transmission of location information during all phases of flight and communication of other data for other functions.
* The suborbital vehicles shall ensure the protection and not impose any constraint on other services or applications operated in the same service. The suborbital vehicles shall not impact the radiocommunications of conventional satellite launchers.

**7.1.4 CITEL**

* An Administration considers to pursue studies called for by Resolution 772 (WRC-19) as a basis for possible new regulatory provisions to support the growing radiocommunications needs of sub-orbital vehicles.

**7.1.5 RCC**

* The RCC Administrations consider that, since the stations on board sub-orbital vehicles shall provide voice/data communications, navigation, surveillance, telemetry, tracking and command, they shall operate only within the current frequency allocations in the aeronautical mobile (OR), aeronautical radionavigation, aeronautical mobile-satellite and radionavigation satellite services, as well as space operation service, depending on the information being transmitted.
* The RCC Administrations also consider that stations on board a sub-orbital vehicle shall ensure its safe flight in international airspace and its interoperability with civil aviation systems, moreover, these stations shall not cause unacceptable interference to the operation of stations on board launch vehicles.

**7.2 International Organisations**

**7.2.1 ICAO**

* To support ITU-R studies and the definition of relevant technical characteristics as called for by Resolution 772 (WRC-19) to ensure aviation needs are satisfied.
* To support, if identified as required by the studies called for in Resolution 772 (WRC-19), modifications to the Radio Regulations that help enable the integration of sub-orbital vehicles into the airspace structure.
* To support, if studies show the need for access to additional spectrum, the establishment of a WRC agenda item at a future competent conference.

**7.2.2 SFCG**

* SFCG supports studies in the ITU-R with the objective to develop regulatory provisions for radiocommunications for sub-orbital vehicles in order to facilitate the safe integration of sub-orbital vehicles into the existing air traffic management system.
* Any negative impact on EESS, SOS, SRS and MetSat operations must be avoided. It is also important that any regulatory changes associated with this agenda item will not adversely impact the operation of launch vehicles or sounding rockets.

**7.2.3 WMO**

* WMO supports studies on the development of regulatory provisions to meet the requirements of sub-orbital vehicle operations but would be opposed to provisions that have a negative impact to current and future MetSat and EESS operations.

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