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| **The 3rd Meeting of the APT Conference Preparatory Group for WRC-23 (APG23-3)** | **APG23-3/OUT-17** |
| 8 – 13 November 2021, Virtual/Online Meeting | 13 November 2021 |

Working Party 2

**PRELIMINARY VIEWs on WRC-23 agenda item 1.10**

**Agenda Item 1.10:**

*to conduct studies on spectrum needs, coexistence with radiocommunication services and regulatory measures for possible new allocations for the aeronautical mobile service for the use of non-safety aeronautical mobile applications, in accordance with Resolution* ***430 (WRC 19)****;*

**1. Background**

Resolution **430 (WRC-19)** resolves to invite ITU-R to conduct, and complete in time for WRC-23:

* studies on spectrum needs for new non-safety aeronautical mobile applications for air-to-air, ground-to-air and air-to-ground communications of aircraft systems;
* sharing and compatibility studies in the frequency band 22-22.21 GHz, already allocated on a primary basis to the mobile, except aeronautical mobile, service, in order to evaluate the possible revision or deletion of the “except aeronautical mobile” restriction while ensuring the protection of primary services in the considered frequency bands and, as appropriate, in adjacent frequency bands;
* sharing and compatibility studies on possible new primary allocations to the aeronautical mobile service (AMS) for non-safety aeronautical applications in the frequency band 15.4-15.7 GHz, while ensuring the protection of primary services in the considered frequency bands and, as appropriate, adjacent frequency bands;
* definition of appropriate protection for passive services and radio astronomy allocated in adjacent bands from unwanted emission of AMS.

In accordance with the results of CPM23-1, ITU-R Working Party 5B (WP 5B) was assigned to be the responsible group for the Agenda Item 1.10.

During the past three WP 5B meetings, the Working Document towards a Preliminary Draft New Report ITU-R M.[NON-SAFETY AMS CHARACTERISTICS AND SHARING STUDIES] was generated. The working document provides various characteristics from ITU-R Recommendations of systems in the incumbent services, recommended propagation models as well as preliminary characteristics and operational concept of systems in the possible new AMS allocation for non-safety application. In addition, preliminary sharing studies were incorporated into this working document. The draft CPM text is still in a skeleton status due to a lack of contributions. WP 5B has also exchanged information with the contributing groups.

Relevant ITU-R Reports/Recommendations and ongoing studies are as follows,

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| *Recommendations* | |
| [ITU-R F.758](https://www.itu.int/rec/R-REC-F.758/en) | System parameters and considerations in the development of criteria for sharing or compatibility between digital fixed wireless systems in the fixed service and systems in other services and other sources of interference |
| [ITU-R M.1730](https://www.itu.int/rec/R-REC-M.1730-1-200910-I/en) | Characteristics of and protection criteria for the radiolocation service in the frequency band 15.4-17.3 GHz |
| [ITU-R RA.517](https://www.itu.int/rec/R-REC-RA.517-4-200605-I/en) | Protection of the radio astronomy service from transmitters operating in adjacent bands. |
| [ITU-R RA.769](https://www.itu.int/rec/R-REC-RA.769-2-200305-I/en) | Protection criteria used for radio astronomical measurements |
| [ITU-R RA.1513](https://www.itu.int/rec/R-REC-RA.1513-2-201503-I/en) | Levels of data loss to radio astronomy observations and percentage-of-time criteria resulting from degradation by interference for frequency bands allocated to the radio astronomy service on a primary basis |
| [ITU-R RA.1631](https://www.itu.int/rec/R-REC-RA.1631-0-200305-I/en) | Reference radio astronomy antenna pattern to be used for compatibility analyses between non-GSO systems and radio astronomy service stations based on the epfd concept |
| [ITU-R RS.1028](https://www.itu.int/rec/R-REC-RS.1028-2-200305-W/en) | Performance criteria for satellite passive remote sensing |
| [ITU-R RS.1029](https://www.itu.int/rec/R-REC-RS.1029-2-200305-W/en) | Interference criteria for satellite passive remote sensing |
| [ITU-R RS.1813](https://www.itu.int/rec/R-REC-RS.1813-1-201102-I/en) | Reference antenna pattern for passive sensors operating in the Earth exploration-satellite service (passive) to be used in compatibility analyses in the frequency range 1.4-100 GHz |
| [ITU-R RS.1861](https://www.itu.int/rec/R-REC-RS.1861/en) | Typical technical and operational characteristics of Earth exploration-satellite service (passive) systems using allocations between 1.4 and 275 GHz |
| [ITU-R RS.2017](https://www.itu.int/rec/R-REC-RS.2017/en) | Performance and interference criteria for satellite passive remote sensing |
| [ITU-R S.1340](https://www.itu.int/rec/R-REC-S.1340-0-199710-I/en) | Sharing between feeder links for the mobile-satellite service and the aeronautical radionavigation service in the Earth-to-space direction in the band 15.4-‑15.7 GHz |
| [ITU-R S.1341](https://www.itu.int/rec/R-REC-S.1341-0-199710-I/en) | Sharing between feeder links for the mobile-satellite service and the aeronautical radionavigation service in the space-to-Earth direction in the band 15.4‑15.7 GHz and the protection of the radio astronomy service in the band 15.35-15.4 GHz |
| [ITU-R SA.509](https://www.itu.int/rec/R-REC-SA.509-3-201312-I/en) | Space research earth station and radio astronomy reference antenna radiation pattern for use in interference calculations, including coordination procedures, for frequencies less than 30 GHz |
| [ITU-R SA.510](https://www.itu.int/rec/R-REC-SA.510-3-201707-I/en) | Feasibility of frequency sharing between the space research service and other services in bands near 14 and 15 GHz - Potential interference from data relay satellite systems |
| *Reports* |  |
| [ITU-R M.2170](https://www.itu.int/pub/R-REP-M.2170-2009) | Compatibility analysis and results for radiolocation systems planned to operate in the 15.4 to 17.3 GHz band and aircraft landing system operating in the 15.4‑15.7 GHz band as well as the radio astronomy service operating in the adjacent band 15.35-15.40 GHz, FSS systems and aeronautical radionavigation systems |
| [ITU-R M.2229](https://www.itu.int/pub/R-REP-M.2229-2011) | Compatibility study to support line-of-sight control and non-payload communications links for unmanned aircraft systems proposed in the frequency band 15.4-15.5 GHz |
| [ITU-R M.2230](https://www.itu.int/pub/R-REP-M.2230-2011) | Frequency sharing between unmanned aircraft systems for beyond line of sight control and non-payload communications links and other existing and planned services in the frequency bands 13.25-13.40 GHz, 15.4-15.7 GHz, 22.5‑22.55 GHz and 23.55-23.60 GHz |
| [ITU-R RA.2131](https://www.itu.int/pub/R-REP-RA.2131-2009) | Supplementary information on the detrimental threshold levels of interference to radio astronomy observations in Recommendation ITU-R RA.769 |

WDPDN Recommendation ITU-R M.[15.4-15.7 GHz ARNS] Characteristics of and protection criteria for radars operating in the aeronautical radionavigation service in the frequency band 15.4‑15.7 GHz.

**2. Documents**

* Input Documents: APG23-3/INP-08(AUS), APG23-3/INP-25(KOR), APG23-3/INP-29(J), APG23-3/INP-42(CHN), APG23-3/INP-52(VTN).
* Information Documents: APG23-3/INF-01(WMO), APG23-3/INF-15(ICAO), APG23-3/INF-20(CEPT), APG23-3/INF-37(ASMG), APG23-3/INF-39(ATU).

**3. Summary of discussions**

**3.1 Summary of APT Members’ views**

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

Australia supports studies on spectrum needs for new non-safety aeronautical mobile applications as well as sharing and compatibility studies in the 15.4-15.7 GHz and 22-22.21 GHz frequency bands to evaluate possible primary allocations to aeronautical mobile services, while ensuring the protection of primary services in these bands and, as appropriate, in adjacent frequency bands.

**3.1.2 Korea** - **Document APG23-3/INP-25**

The Republic of Korea supports ongoing ITU-R studies for possible new allocations for the aeronautical mobile service for the use of non-safety aeronautical mobile applications, in accordance with Resolution 430 (WRC-19). The Republic of Korea is also of the view that the protection of existing primary services in the 15.4-15.7 GHz and 22-22.21 GHz frequency bands and, as appropriate, in adjacent frequency bands should be ensured.

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

Japan supports ongoing ITU-R studies on spectrum needs, coexistence with radiocommunication services and regulatory measures for possible new allocations for the aeronautical mobile service for the use of non-safety aeronautical mobile applications, in accordance with Resolution **430 (WRC-19)**;

Japan is of the view that the protection of existing primary services in the 15.4-15.7 GHz and 22-22.21 GHz frequency bands and, as appropriate, in adjacent frequency bands should be ensured.

**3.1.4 China** - **Document APG23-3/INP-42**

* China supports studies being conducted in ITU-R in accordance with Resolution **430 (WRC-19)**;
* China considers that the protection of incumbent services in the frequency bands 15.4-15.7GHz and 22-22.21GHz and adjacent frequency bands should be ensured.

**3.1.5 Viet Nam** - **Document APG23-3/INP-52**

Viet Nam supports ITU-R studies on spectrum needs, coexistence with radiocommunication services and regulatory measures for possible new allocation to AMS for the use of non-safety aeronautical mobile applications in the frequency bands 15.4-15.7 GHz and 22-22.21 GHz in accordance with Resolution **430 (WRC-19),** while ensuring no adverse effect on the allocation of the existing services and their future development in the same and adjacent frequency bands, in particular the fixed service allocated in the frequency band 21.2-23.6 GHz.

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

* None.

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

APT Members support ongoing ITU-R studies on spectrum needs, coexistence with radiocommunication services and regulatory measures for possible new allocations for the aeronautical mobile service for the use of non-safety aeronautical mobile applications, in accordance with Resolution **430 (WRC-19)**.

APT Members are of the view that the protection of existing primary services in the 15.4-15.7 GHz and 22-22.21 GHz frequency bands and, as appropriate, in adjacent frequency bands should be ensured.

APT Members are also of the view that the frequency band 21.2-23.6 GHz is extensively used by terrestrial services, in particular the fixed service, to support the development of telecommunication infrastructure in many countries and crucial in developing countries, and no adverse effect on the terrestrial services allocated in this band and its future development should be ensured.

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

* None

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

* APT Members are encouraged to contribute to the next APG meeting on the Agenda Item 1.10, taking into account the studies of ITU-R WP5B, in particular the studies relating to protection of terrestrial services.

**7. Views from Other Organisations**

**7.1 Regional Groups**

**7.1.1 ASMG** - **Document APG23-3/INF-37**

* The necessity of providing the necessary protection to the existing in-band and adjacent band services, for the frequency bands under study.

**7.1.2 ATU** - **Document APG23-3/INF-39**

* Support the ITU-R studies (Working Party 5B) to ensure the protection of incumbent services as well as the adjacent services, such as defining unwanted emission limits and appropriate protection measures for station of aeronautical mobile service in the frequency bands 15.35-15.4 GHz and 22.21-22.5 GHz to protect EESS (passive) and radio astronomy service.

**7.1.3 CEPT** - **Document APG23-3/INF-20**

* CEPT acknowledges the need for additional spectrum to fulfil the increasing demand for non-safety aeronautical applications and is considering a new allocation to AMS for non-safety application in the whole range or a part of the frequency bands 15.4-15.7 GHz and 22-22.21 GHz while:
* any modification of the RR should ensure appropriate protection for the EESS/SRS (passive) and the RAS (taking into account RR No. 5.149) allocated in adjacent frequency band from unwanted emissions of the AMS;
* ensuring protection for in‐band radiolocation and aeronautical radionavigation and FSS (Earth to space) services in the relevant part of the frequency band 15.4-15. 7 GHz;
* ensuring protection for in‐band fixed and mobile services in the frequency band 22‐22.21 GHz, noting that the fixed service is allocated in the 21.2‐23.6 GHz frequency range.

**7.1.4 CITEL** - **Document APG23-2/INF-34**

* To be developed.

**7.1.5 RCC** - **Document APG23-2/INF-36**

* To be developed.

**7.2 International Organisations**

**7.2.1 WMO** - **Document APG23-3/INF-01**

* WMO supports studies to ensure protection of the EESS (passive) in the adjacent frequency band 22.21-22.5 GHz. WMO is also concerned that adjacent band interference may limit usability of passive sensing in the 15.35-15.4 GHz band, however ensuring protection may not be possible due to the lack of operational characteristics and sharing criteria.

**7.2.2 ICAO** - **Document APG23-3/INF-15**

* To support ITU-R studies as called for by Resolution **430 (WRC-19)**.
* To support, based on the agreed results of studies, new allocations to the aeronautical mobile service only for use by non-safety aeronautical mobile applications.
* To ensure that any such modification does not adversely affect the status or provision of aeronautical safety services.

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