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|  | ASIA-PACIFIC TELECOMMUNITY | Document No: |
| **The 6th Meeting of the APT Conference Preparatory**  **Group for WRC-23 (APG23-6)** | **APG23-6/OUT-19** |
| 14 – 19 August 2023, Brisbane, Australia | 19 August 2023 |

Working Party 2

**APT VIEW and Preliminary APT Common Proposal**

**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 recent WP5B meeting held in July 2023, the Working Document towards PDN Report ITU-R M.[NON-SAFETY AMS CHARACTERISTICS AND SHARING STUDIES] was revised with updated sharing studies with radiolocation, radio astronomy, EESS (passive) and fixed services. Finally, the meeting agreed elevating this Working Document to PDN Report.

Regarding the CPM Report, the following methods were proposed to satisfy this agenda item:

**Method A: No change (NOC)**

This method proposes no changes to the Radio Regulations.

**Method B: New primary AM(OR)S allocation in the frequency band 15.4-15.7 GHz**

This method proposes to add an AM(OR)S allocation in the frequency band 15.4-15.7 GHz with an associated footnote.

**Method C: Remove the exception of AM(OR)S in the frequency band 22-22.21 GHz**

This method proposes to remove the exception of aeronautical mobile service of the mobile service allocation in the frequency band 22-22.21 GHz, and to add associated footnotes.

**Method D: Combination of Methods B and C**

This method proposes to add an AM(OR)S allocation in the frequency band 15.4-15.7 GHz with an associated footnote, and to remove the exception to aeronautical mobile (off-route) service of the MOBILE allocation in the frequency band 22-22.21 GHz, and to add associated footnotes.

**Method E: Combination of Methods B and C with 10 MHz guard bands**

This method proposes to add an AM(OR)S allocation in the frequency band 15.41-15.7 GHz with associated footnotes, and to remove the exception to aeronautical mobile (off-route) service of the MOBILE allocation in the frequency band 22-22.2 GHz, and to add associated footnotes.

All the methods propose the suppression of Resolution **430 (WRC-19)**.

The relevant ITU-R Recommendations are:

Characteristics and protection criteria: [F.758-7](https://www.itu.int/rec/R-REC-F.758-7-201911-I/en), [F.1495-2](https://www.itu.int/rec/R-REC-F.1495/en), [F.1565-1](https://www.itu.int/rec/R-REC-F.1565/en), [M.1461-2](https://www.itu.int/rec/R-REC-M.1461/en), [M.1730-1](https://www.itu.int/rec/R-REC-M.1730/en), [M.1825‑0](https://www.itu.int/rec/R-REC-M.1825/en), [M.2089-0](https://www.itu.int/rec/R-REC-M.2089/_page.print), [M.2114-0](https://www.itu.int/rec/R-REC-M.2114/en), [M.2115-0](https://www.itu.int/rec/R-REC-M.2115/en), [M.2116-0](https://www.itu.int/rec/R-REC-M.2116/en), [M.2120-0](https://www.itu.int/rec/R-REC-M.2120/en), [RA.769-2](https://www.itu.int/rec/R-REC-RA.769/en), [RA.1513-2](https://www.itu.int/rec/R-REC-RA.1513/en), [RS.1861‑1](https://www.itu.int/rec/R-REC-RS.1861/en), [RS.2017‑0](https://www.itu.int/rec/R-REC-RS.2017/en), and WDPDN Recommendation ITU-R M.[15.4-15.7\_GHz\_ARNS].

Antenna patterns: [F.699-8](https://www.itu.int/rec/R-REC-F.699/en), [F.1245-3](https://www.itu.int/rec/R-REC-F.1245/en), [F.1336-5](https://www.itu.int/rec/R-REC-F.1336/en), [M.1851-1](https://www.itu.int/rec/R-REC-M.1851/en), [RA.1631-0](https://www.itu.int/rec/R-REC-RA.1631/en), [RS.1813-1](https://www.itu.int/rec/R-REC-RS.1813/en), [S.465-6](https://www.itu.int/rec/R-REC-S.465/_page.print), [S.580‑6](https://www.itu.int/rec/R-REC-S.580/en), [S.672-4](https://www.itu.int/rec/R-REC-S.672/en), and [SA.509-3](https://www.itu.int/rec/R-REC-SA.509/en).

Propagation models and others: [P.452-17](https://www.itu.int/rec/R-REC-P.452/en), [P.453-7](https://www.itu.int/rec/R-REC-P.453/en), [P.528-5](https://www.itu.int/rec/R-REC-P.528/en), [P.619-5](https://www.itu.int/rec/R-REC-P.619/en), [P.676-12](https://www.itu.int/rec/R-REC-P.676/en), [P.835-6](https://www.itu.int/rec/R-REC-P.835/en), [P.1409-2](https://www.itu.int/rec/R-REC-P.1409/en), [RA.1513-2](https://www.itu.int/rec/R-REC-RA.1513/en), [S.1340-0](https://www.itu.int/rec/R-REC-S.1340/en), [SM.337-6](https://www.itu.int/rec/R-REC-SM.337/en), and [SM.1541-6](https://www.itu.int/rec/R-REC-SM.1541).

The relevant sharing studies ITU-R Reports are: [M.2230-0](https://www.itu.int/pub/R-REP-M.2230/en), and [RA.2188-0](https://www.itu.int/pub/R-REP-RA.2188), [M.2170-0](https://www.itu.int/pub/R-REP-M.2170), [M.2229-0](https://www.itu.int/pub/R-REP-M.2229).

PDN Report ITU-R M.[NON-SAFETY AM(OR)S CHARACTERISTICS AND SHARING STUDIES].

**2. Documents**

* Input Documents: APG23-6/INP-18(IND), APG23-6/INP-24(BGD), APG23-6/INP-31(J), APG23-6/INP-48(INS), APG23-6/INP-59(THA), APG23-6/INP-66R1(IRN), APG23-6/INP-81(AUS), APG23-6/INP-88(KOR), APG23-6/INP-93(PHI), APG23-6/INP-104(CHN), APG23-6/INP-110(MLA), APG23-6/INP-119(VTN).
* Information Documents: APG23-6/INF-02(WMO), APG23-6/INF-25(ICAO), APG23-6/INF-26(ICAO), APG23-6/INF-45(RCC), APG23-6/INF-46(CEPT), APG23-6/INF-52(CITEL).

**3. Summary of discussions**

**3.1 Summary of APT Members’ views**

**3.1.1 India** - **Document APG23-6/INP-18**

India supports NOC for this Agenda Item.

**3.1.2 Bangladesh - Document APG23-6/INP-24**

To satisfy this agenda item, Bangladesh administration supports method B of the draft CPM report to WRC-2023. However, method D could be supported if fixed service is protected from aeronautical mobile service (AMS).

**3.1.3 Japan - Document APG23-6/INP-31**

For the new allocation of AM(OR)S to 15.4-15.7 GHz, Japan is of the view that an agreed condition to ensure the protection of current/future systems under incumbent services operated in the same frequency band (ARNS (Aeronautical Radio Navigation Service), RLS (Radiolocation Service)) and in the adjacent frequency band (RA (Radio Astronomy)) is necessary.

For the new allocation of AM(OR)S to 22-22.21 GHz, Japan is also of the view that an agreed condition to ensure the protection of current/future systems under incumbent services operated in the same frequency band (MS (Mobile Service)) and in adjacent frequency band (EESS (Earth Exploration Satellite Service) (passive), RA(Radio Astronomy)) is necessary.

Reason: Japan considers that the protection of current/future systems under incumbent services should be the top priority.

**3.1.4 Indonesia - Document APG23-6/INP-48**

Indonesia supports the possible new allocations, taking into account to ensure that it does not adversely affect the existing, and plan status or provision of aeronautical safety services as well as other services.

**3.1.5 Thailand (Kingdom of) - Document APG23-6/INP-59**

Thailand supports Method A which proposes no change to the Radio Regulations due to concerns on the practicality of sharing conditions.

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**3.1.6 Iran - Document APG23-6/INP-66R1**

The Administration of Iran (Islamic Republic of) supports Method C which proposes to remove the exception of aeronautical mobile service of the mobile service allocation in the frequency band 22-22.21 GHz, and to add associated footnotes. However, there is a need that the protection of primary services are allocated in the 15.4-15.7 GHz and 22-22.21 GHz frequency bands and in adjacent frequency bands should be ensured. Also, AM(OR)S shall not cause unacceptable interference to nor claim protection from these services.

**3.1.7 Australia - Document APG23-6/INP-81**

Australia does not oppose new allocations to the aeronautical mobile service for use by non-safety aeronautical mobile applications on a primary basis in the frequency bands 15.4- 15.7 GHz and 22-22.21 GHz.

Any such modification shall not adversely affect the status or provision of aeronautical safety services.

Australia does not propose a Preliminary APT Common Proposal on this agenda item.

**3.1.8 Korea (Republic of) - Document APG23-6/INP-88**

Based on the study results conducted by ITU-R on WRC-23 agenda item 1.10 in accordance with Resolution **430 (WRC-19)**, the Republic of Korea does not oppose new allocations to the aeronautical mobile service for use by non-safety aeronautical mobile applications on primary basis in the frequency bands 15.4-15.7 GHz and 22-22.21 GHz, provided that the protection of other primary services in the same and the adjacent bands is ensured.

**3.1.9 Philippines - Document APG23-6/INP-93**

Philippines is of the view that the protection of incumbent services in the frequency bands 15.4-15.7 GHz, 22-22.21 GHz and the adjacent frequency bands should be ensured. Our administration supports Method A which proposes no change to the Radio Regulations.

**3.1.10 China - Document APG23-6/INP-104**

China is of the view that the protection of incumbent services in the frequency bands 15.4-15.7GHz and 22-22.21GHz and the adjacent frequency bands should be ensured, and supports Method A.

**3.1.11 Malaysia - Document APG23-6/INP-110**

Malaysia supports new allocation to the AM(OR)S in the 15.4-15.7 GHz frequency band or part thereof, and/or remove the exception to AM(OR)S of the mobile allocation in the 22-22.21 GHz frequency band or part thereof.

Malaysia also 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 in the adjacent frequency bands shall be ensured.

As such, Malaysia is considering Method B and/or C or Method E to address this agenda item.

**3.1.12 Viet Nam - Document APG23-6/INP-119**

Viet Nam supports Method A in the CPM report.

*Reasons: The frequency band 15.4-15.7 GHz is allocated to the aeronautical radionavigation service used for automatic landing systems (ALS) and unmanned aircraft detect and avoid (DAA) systems. This related to safety of life and the Recommendation for providing characteristics and protection requirements for these ARNS systems has not been published. The 22-22.21 GHz band, some studies has been summarized in CPM report that the short-term interference threshold of fixed stations may be exceeded in some situations with single-entry part and with the multiple-entry part, the long-term protection criterion of the fixed station is exceeded when high densities of such omnidirectional aircraft stations are operated within the visibility area of a sector of the fixed station.*

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

* Due to the divergence of the Methods or views proposed by APT Members to satisfy this agenda item, it was not possible to develop a Preliminary APT Common Proposal (PACP) for this agenda item at the APG23-6 meeting.
* APT Members are encouraged to actively participate in the discussion at WRC-23 with the views to implement their views on this agenda item.

**4. APT View(s)**

The APT has considered agenda item 1.10 but has not developed a Preliminary APT Common Proposal on the matter. The APT has however agreed the following view(s) on the agenda item 1.10.

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, in adjacent frequency bands shall be ensured. APT Members also are of the view that any potential new allocations of AM(OR)S shall not cause unacceptable interference to, nor claim protection from services to which the bands are allocated together with a firm objective, actionable evidence, measurable and enforceable commitment at the time of submission to that agenda item to undertake compliance with non-interference and non-protection conditions.

**5. Preliminary APT Common Proposal**

* None.

**6. Issues for Consideration at APG Coordination Meeting at WRC-23 (if any)**

* The following table shows the views of APT Members on this agenda item in the APG23-6 meeting:

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| Method A (NOC) | IND, THA, PHI, CHN, VTN |
| Method B/D | BGD |
| Method C | IRN |
| Supports/Not opposes new allocations (Method B/C/D/E) | INS, KOR |
| Not opposes new allocations (Method B/C/D/E) and not proposes a PACP | AUS |
| Considering Method B/C/E | MLA |
| An agreed condition to ensure the protection of current/future systems under incumbent services operated in the same frequency band and in the adjacent frequency band is necessary. | J |

* APT Members are encouraged to actively participate in the APG Coordination Meetings at WRC-23.

**7. Views from Other Organisations**

**7.1 Regional Groups**

**7.1.1 ASMG** - **Document APG23-4/INF-21**

* Follow on-going studies with the need to provide the necessary protection for incumbent services in the frequency bands under study and adjacent bands, and consider the possibility of adding a new allocation to the aeronautical mobile service for non-safety aeronautical mobile applications in the frequency bands under study.

**7.1.2 ATU - Document APG23-6/INF-55**

1. **Support** **Method E**, that is the Combination of Methods B and C with 10 MHz guard bands.
2. **In order to** provide a new allocation in the band 15.41-15.7 GHz to the aeronautical mobile (off‑route) service for introduction of new non-safety aeronautical mobile applications (off-route).
3. **In order to** provide a new allocation in the band 22-22.2 GHz to the aeronautical mobile (off‑route) service for introduction of new non-safety aeronautical mobile (off-route) applications.

**7.1.3 CEPT - Document APG23-6/INF-46**

CEPT acknowledges the need for additional spectrum to fulfil the increasing demand for non-safety aeronautical mobile applications. Therefore, CEPT supports new allocations to AM(OR)S 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:

* ensuring protection of the EESS/SRS (passive), and the RAS from unwanted emissions of the AM(OR)S;
* not claiming protection nor create harmful interference to radiolocation and aeronautical navigation services in the 15.4-15.7 GHz frequency band;
* ensuring protection of the primary allocations to fixed-satellite (Earth-to-space) service in the frequency band 15.43-15.63 GHz;
* ensuring protection of the primary allocations to the fixed and mobile services in the frequency band 22-22.21 GHz noting that the frequency range 21.2-23.6 GHz is allocated to the fixed service;
* considering that RR No. 5.149 applies, also recognizing that some CEPT administrations operate RAS under their National regulation with a primary or secondary status in the frequency band 22.00-22.21 GHz.

Noting that some CEPT Administrations operate water vapour radiometers in the frequency range 22-22.5 GHz utilized by some radio astronomy stations and in a variety of environmental applications, including weather forecasting and nowcasting, as well as climate monitoring for meteorology, CEPT will also ensure their necessary protection.

**7.1.4 CITEL - Document APG23-6/INF-52**

**Draft Inter-American Proposal:**

A number of Administrations provided Preliminary Proposal at recent CITEL meeting. This proposal is based on the sharing and compatibility studies carried out in line with Resolution **430 (WRC-19)** in the frequency bands 15.4-15.7 GHz and 22 -22.21 GHz in consideration of new allocation for aeronautical mobile service for non-safety applications.

* **NOC** in relation to frequency band 15.4-15.7 GHz
* **NOC** in relation to frequency band 22.0-22.21 GHz
* SUP RESOLUTION **430 (WRC-19)** – Consequential to the results of studies at ITU-R in relation to this Resolution.

**7.1.5 RCC - Document APG23-6/INF-45**

The RCC Telecommunication Administrations do not object to the new allocations to the Aeronautical Mobile Service in the frequency band 15.4 - 15.7 GHz, as well as to removal of restrictions for the use of the frequency band 22–22.21 GHz by the Aeronautical Mobile Service, providing the protection conditions for the following services:

* Radiolocation and Aeronautical Radionavigation Service in the frequency band 15.4-15.7 GHz, Fixed-Satellite Service in the frequency band 15.43-15.63 GHz and Fixed Service in the frequency band 22-22.21 GHz;
* Radio Astronomy Service in the frequency bands 15.35-15.4 GHz and 22.21-22.5 by limiting unwanted emissions from stations in the Aeronautical Mobile Service in these frequency bands.

The stations in the Aeronautical Mobile Service in the frequency bands 15.4-15.7 GHz and 22- 22.21 GHz, when operating outside the national territory, cannot claim protection from interference caused by stations of other primary services.

Method D from the CPM Report is preferable.

**7.2 International Organisations**

**7.2.1 ICAO - Document APG23-6/INF-25**

* Based upon the agreed results of studies, not to oppose new allocations to the aeronautical mobile service for use by non-safety aeronautical mobile applications on a primary basis in the frequency bands 15.4-15.7 GHz and 22-22.21 GHz.
* To ensure that any such modification does not adversely affect the status or provision of aeronautical safety services.

**7.2.2 WMO - Document APG23-6/INF-02**

* WMO is not opposed to new allocations for the aeronautical mobile service for the use of non-safety aeronautical mobile applications, if an appropriate unwanted emission limit (-23 dBW per 100 MHz) applies in the band 22.21-22.5 GHz to ensure that EESS (passive) is protected from the AM(OR)S. Option 2 of Methods C, D and E, of the CPM Report aligns with WMO objectives.

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