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| **The 3rd Meeting of the APT Conference Preparatory Group for WRC-23 (APG23-3)** | **APG23-3/OUT-08** |
| 8 – 13 November 2021, Virtual/Online Meeting | 13 November 2021 |

Working Party 1

**PRELIMINARY VIEWs on WRC-23 agenda item 1.4**

**Agenda Item 1.4:**

*to consider, in accordance with Resolution* ***247 (WRC-19)****, the use of high-altitude platform stations as IMT base stations (HIBS) in the mobile service in certain frequency bands below 2.7 GHz already identified for IMT, on a global or regional level;*

**1. Background**

* This Agenda Item was initiated by APT ([24A24-A4](https://www.itu.int/dms_pub/itu-r/md/16/wrc19/c/R16-WRC19-C-0024%21A24-A4%21MSW-E.docx)), ATU ([46A24-A8](https://www.itu.int/dms_ties/itu-r/md/16/wrc19/c/R16-WRC19-C-0046%21A24-A8%21MSW-E.docx)), CITEL ([11A24-A2)](https://www.itu.int/dms_pub/itu-r/md/16/wrc19/c/R16-WRC19-C-0011%21A24-A2%21MSW-E.docx) and PNG ([67A24](https://www.itu.int/dms_pub/itu-r/md/16/wrc19/c/R16-WRC19-C-0067%21A24%21MSW-E.docx)) in WRC-19.
* At WRC-2000, the bands 1 885-1 980 MHz, 2 010-2 025 MHz and 2 110-2 170 MHz in Regions 1 and 3 and the bands 1 885-1 980 MHz and 2 110-2 160 MHz in Region 2 were identified in the mobile service for high altitude platform stations as IMT base station (HIBS) as in RR No. **5.388A** and Resolution **221** **(Rev.WRC-07)** stipulates to develop an ITU-R Recommendation providing technical guidance to facilitate consultations with neighboring administrations for HIBS. Since 2000, IMT systems have evolved significantly in terms of spectrum identification, network deployment and radio access technology, with the standardization of IMT-Advanced and IMT-2020. It is now timely to review the existing provisions of the Radio Regulations (RR) in order to provide the same flexibility granted in RR No. **5.388A** to other bands below 2.7 GHz globally or regionally harmonized for IMT.
* In addition, HIBS would be used as part of terrestrial IMT networks and may use the same frequency bands as ground-based IMT base stations. In this sense, the user equipment to be served, whether by the high-altitude or the ground-based IMT base stations, are the same. Currently user equipment already supports a variety of frequency bands identified for IMT, which is another reason to expand the use of HIBS to other globally or regionally harmonized IMT bands below 2.7 GHz.
* List of relevant documents:
* [Recommendation ITU-R M.1456](https://www.itu.int/rec/R-REC-M.1456/recommendation.asp?lang=en&parent=R-REC-M.1456-0-200005-I) “Minimum performance characteristics and operational conditions for high altitude platform stations providing IMT-2000 in the bands 1 885-1 980 MHz, 2 010-2 025 MHz and 2 110-2 170 MHz in Regions 1 and 3 and 1 885-1 980 MHz and 2 110-2 160 MHz in Region 2”
* [Recommendation ITU-R M.1641](https://www.itu.int/rec/R-REC-M.1641/recommendation.asp?lang=en&parent=R-REC-M.1641-1-200603-I) “A methodology for co-channel interference evaluation to determine separation distance from a system using high-altitude platform stations to a cellular system to provide IMT-2000 service”
* [APT/AWG/REP-92](https://www.apt.int/sites/default/files/2019/07/APT-AWG-REP-92_-_Report_on_HIBS.docx) ”APT Report on Technical and Operational Analysis for Using High Altitude Platform Station as IMT Base Stations (HIBS) in the Frequency Bands below 2.7 GHz identified for IMT”

**2. Documents**

* Input Documents
APG23-2/[INP-10 (Rev.1)](https://www.apt.int/sites/default/files/2021/04/APG23-2-INP-10Rev.1.docx) (J), [INP-24](https://www.apt.int/sites/default/files/2021/04/APG23-2-INP-24_AUS_contribution_for_WP1_Preliminary_Views_on_WRC-23_Agenda_Items_1.1_1.2_1.3_1.4_1.5_9.1Topic_c_and_No._21.5.docx) (AUS), [INP-30](https://www.apt.int/sites/default/files/2021/04/APG23-2-INP-30_WP1_kor.docx) (KOR), [INP-39](https://www.apt.int/sites/default/files/2021/04/APG23-2-INP-39_Indonesia_WP1.docx) (INS), [INP-50](https://www.apt.int/sites/default/files/2021/04/APG23-2-INP-50_VTN_WP1_PV_1.1_1.2_1.3_1.4_1.5.docx) (VTN)
APG23-3/[INP-07](https://www.apt.int/sites/default/files/2021/10/APG23-3-INP-07_AUS_contribution_for_WP1_Preliminary_Views_on_WRC-23_Agenda_Items_1.1_1.2_1.3_1.4_1.5_9.1Topic_c_and_No._21.5_v2.docx) (AUS), [INP-12](https://www.apt.int/sites/default/files/2021/10/APG23-3-INP-12_Thailand_PV_WP1_AI_1.1_1.4_9.1c.docx) (THA), [INP-15](https://www.apt.int/sites/default/files/2021/10/APG23-3-INP-15_Indonesia-Preliminary_Views_on_WRC-23_Agenda_Item_1.4.docx) (INS), [INP-24](https://www.apt.int/sites/default/files/2021/11/APG23-3-INP-24_WP1_Kor_1.1_1.2_1.4_9.1Topic_C_21.5.docx) (KOR), [INP-28](https://www.apt.int/sites/default/files/2021/11/APG23-3-INP-28_J-1_WP1_PRELIMINARY_VIEWS_ON_WRC-23_AGENDA_ITEMS_1.1_1.2_1.3_1.4_AND_RR_NO._21.5.docx) (J), [INP-41](https://www.apt.int/sites/default/files/2021/11/APG23-3-INP-41_China_WP1.docx) (CHN), [INP-46](https://www.apt.int/sites/default/files/2021/11/APG23-3-INP-46_Iran-AI1.2_1.3_1.4_1.5_9.1c.docx) (IRN), [INP-51](https://www.apt.int/sites/default/files/2021/11/APG23-3-INP-51_VTN_WP1_PV_1.1_1.2_1.3_1.4_1.5.docx) (VTN)
* Information Documents
APG23-2/[INF-11](https://www.apt.int/sites/default/files/2021/03/APG23-2-INF-11_Briefing_on_AI1.4.docx) (DG Chair), [INF-25](https://www.apt.int/sites/default/files/2021/04/APG23-2-INF-25_ASMG_Preparation_for_WRC-23.pdf) (ASMG), [INF-26](https://www.apt.int/sites/default/files/2021/04/APG23-2-INF-26_State_of_ATU_WRC-23_Preparations.docx) (ATU), [INF-34](https://www.apt.int/sites/default/files/2021/04/APG23-2-INF-34_CITEL_Preparation_for_WRC-23.pdf) (CITEL), [INF-35](https://www.apt.int/sites/default/files/2021/04/APG23-2-INF-35_Status_of_CEPT_Preparation_for_WRC-23_and_RA-23.pdf) (CEPT), [INF-36](https://www.apt.int/sites/default/files/2021/04/APG23-2-INF-36_RCC_Preparation_to_the_World_Radio_Conference_and_Radio_Assembly_2023.pdf) (RCC)
APG23-3/ [INF-01](https://www.apt.int/sites/default/files/2021/10/APG23-3-INF-01_Preliminary_WMO_Position_on_WRC-23_Agenda.docx) (WMO), [INF-03](https://www.apt.int/sites/default/files/2021/11/APG23-3-INF-03Rev.1_Briefing_on_AI1.4.docx) (Rev.1) (DG Chair), [INF-15](https://www.apt.int/sites/default/files/2021/10/APG23-3-INF-15_ICAO-Position_for_ITU_WRC-23.docx) (ICAO), [INF-20](https://www.apt.int/sites/default/files/2021/11/APG23-3-INF-20_Status_of_CEPT_Preparation_for_WRC-23_and_RA-23.pdf) (CEPT), [INF-37](https://www.apt.int/sites/default/files/2021/11/APG23-3-INF-37_ASMG_Preparation_for_WRC-23.pdf) (ASMG) , [INF-39](https://www.apt.int/sites/default/files/2021/11/APG23-3-INF-39_Report_of_APM23-2.docx) (ATU)

**3. Summary of discussions**

**3.1 Summary of APT Members’ views**

**3.1.1 Australia** - **Document APG23-3/**[**INP-07**](https://www.apt.int/sites/default/files/2021/10/APG23-3-INP-07_AUS_contribution_for_WP1_Preliminary_Views_on_WRC-23_Agenda_Items_1.1_1.2_1.3_1.4_1.5_9.1Topic_c_and_No._21.5_v2.docx)

* Australia supports establishing a new globally or regionally harmonised regulatory framework that responds to changing technology and improves the efficient use of frequency bands below 2.7GHz already identified for IMT, by facilitating the use of HIBS. Australia notes that any change must ensure the protection of services to which the bands are allocated and should not give priority to HIBS over existing IMT identifications.

**3.1.2 Thailand (Kingdom of)** - **Document APG23-3/**[**INP-12**](https://www.apt.int/sites/default/files/2021/10/APG23-3-INP-12_Thailand_PV_WP1_AI_1.1_1.4_9.1c.docx)

* Thailand supports the ongoing ITU-R studies for establishing a new globally or regionally harmonised regulatory framework for HIBS with a view to providing flexibility of spectrum usage for HIBS in certain frequency bands below 2.7 GHz already identified for IMT referred to in Resolution **247 (WRC-19)**, while ensuring protection of the existing primary services, to which the frequency band is allocated and in the adjacent frequency bands, without imposing any additional technical or regulatory constraints in their deployment including other IMT uses, existing systems and the planned development of primary services.

**3.1.3 Indonesia (Republic of)** - **Document APG23-3/**[**INP-15**](https://www.apt.int/sites/default/files/2021/10/APG23-3-INP-15_Indonesia-Preliminary_Views_on_WRC-23_Agenda_Item_1.4.docx)

* Indonesia is of the view to support the sharing and compatibility studies by ITU-R on certain frequency bands below 2.7 GHz already identified for IMT to be used by HIBS as provisioned by Resolution **247 (WRC-19)** by ensuring the protection to the incumbent services, to which the frequency band is allocated on the primary basis.

**3.1.4 Korea (Republic of)** - **Document APG23-3/**[**INP-24**](https://www.apt.int/sites/default/files/2021/11/APG23-3-INP-24_WP1_Kor_1.1_1.2_1.4_9.1Topic_C_21.5.docx)

* The Republic of Korea is of the preliminary view that considering the growing demand for access to mobile broadband, HIBS has been considered as an approach for providing broadband connectivity and telecommunication services with minimal network infrastructure.
* However, existing and future uses of the relevant frequency bands under this agenda item including ground-based IMT systems should be protected based on the results of sharing and compatibility studies without imposing any additional technical or regulatory constraints in their deployment.

**3.1.5 Japan** - **Document APG23-3/**[**INP-28**](https://www.apt.int/sites/default/files/2021/11/APG23-3-INP-28_J-1_WP1_PRELIMINARY_VIEWS_ON_WRC-23_AGENDA_ITEMS_1.1_1.2_1.3_1.4_AND_RR_NO._21.5.docx)

* Japan supports the ongoing ITU-R studies for establishing a new globally or regionally harmonized regulatory framework for HIBS with a view to providing flexibility of spectrum usage for HIBS in certain frequency bands below 2.7 GHz already identified for IMT referred to in Resolution **247 (WRC-19)**, while ensuring protection of the existing services, to which the frequency band is allocated on a primary basis, without imposing any additional technical or regulatory constraints in their deployment including other IMT uses, existing systems and the planned development of primary services.
* Japan is also of the view that, the current AWG study on “Technical and regulatory analysis of the usage of HAPS gateway links not specified in Radio Regulations” would contribute to the consideration of APT administrations for this agenda item, as it may also provide the possibility of HIBS gateway links by various methods.

**3.1.6 China (People’s Republic of)** - **Document APG23-3/**[**INP-41**](https://www.apt.int/sites/default/files/2021/11/APG23-3-INP-41_China_WP1.docx)

* China supports ITU-R studies being conducted in accordance with Resolution **247 (WRC-19)**.
* China supports the consideration of the identification to HIBS, provided that the protection of the existing services are ensured, to which the frequency band is allocated on a primary basis, without imposing any additional technical or regulatory constraints in their deployment.

**3.1.7 Iran (Islamic Republic of)** - **Document APG23-3/**[**INP-46**](https://www.apt.int/sites/default/files/2021/11/APG23-3-INP-46_Iran-AI1.2_1.3_1.4_1.5_9.1c.docx)

* The Islamic Republic of Iran is of the view that existing services allocated in the frequency bands considered under this agenda item and the adjacent bands, particularly, when neighboring countries use terrestrial IMT base stations and mobile stations, shall be protected based on sharing and compatibility studies, with no additional technical or regulatory constraints on those existing uses and planned development.

**3.1.8 Viet Nam (Socialist Republic of)** - **Document APG23-3/**[**INP-51**](https://www.apt.int/sites/default/files/2021/11/APG23-3-INP-51_VTN_WP1_PV_1.1_1.2_1.3_1.4_1.5.docx)

* Viet Nam supports the ITU-R studies on the use of HIBS with the view that ensuring the protection of primary services, including IMT ground system, in the same and in adjacent frequency bands as appropriate and without imposing any technical or regulatory constraints on these services, in accordance with Resolution **247 (WRC-19)**.
	1. **Summary of issues raised during the meeting**
* In APG23-3 meeting, it was proposed to discuss the following issues among the ongoing ITU-R studies:
	1. The sensitive analysis of HIBS in altitudes lower than 20 km, and their possible regulatory consequences as per the invites 4 of the Resolution **247** **(WRC-19)**;
	2. Some studies considered the scenario of HIBS UEs as interferers, but as the UEs for HIBS and ground-based IMT are the same, views were expressed that no additional studies are required as those bands are already identified for IMT;
	3. Different opinions were expressed regarding the applicability of the information in the Appendix, and thus further discussion is required at the following WP 5D meetings. It should be highlighted that WRC-23 agenda item 1.4, as per Resolution **247 (WRC-19)**, strictly limits the sharing and compatibility studies of frequency bands for HIBS and not for ground-based IMT. Thus, the results of the studies should not impose any constraints in any existing service, including IMT systems. As the current version of text of the Appendix in Annex 4.21 to [5D/886](https://www.itu.int/md/R19-WP5D-C-0886en) may raise concerns regarding the use of ground-based IMT in these bands, the proponents are invited to review the relevance of the information contained herein, noting that currently it should be considered for informational purposes only and not intended to be included as part of the summary of studies for this agenda item.;
	4. How to treat *resolves* 4 in Resolution **247 (WRC-19)** in terms of definition of HIBS.
* As a result of discussion, it was decided not to discuss the above issues related to WRC-23 agenda item 1.4 at the Intersessional Working Party (IWP) meeting between APG23-3 and APG23-4, and APT members are encouraged to participate in ITU-R studies.

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

* APT Members support the ongoing ITU-R studies for establishing a new globally or regionally harmonised regulatory framework for HIBS with a view to providing flexibility of spectrum usage for HIBS in certain frequency bands below 2.7 GHz already identified for IMT referred to in Resolution **247 (WRC-19)**, while ensuring protection of the existing services, to which the frequency band is allocated on a primary basis, and adjacent bands, as appropriate, without adversely affecting in their deployment including other IMT uses, existing systems and the planned development of primary services.

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

* None

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

* APT Members are encouraged to submit their contributions to the next APG23-4 meeting taking into account progress of ITU-R studies;
* APT Members are also encouraged to submit their contributions on specific frequency bands and interference scenarios in the neighbouring countries and regions to the next APG23-4;
* APT Members are also encouraged to discuss how to address the overlapping frequency bands between AIs 1.4 and 1.18 under the circumstances where the NB-MSS characteristics for AI 1.18 have not been provided from WP 4C to WP 5D. This matter could also be discussed at the IWP meeting between APG23-3 and APG23-4, provided that there would be further information developed on the matter by ITU-R.

**7. Views from Other Organisations** (as provided in the information documents to

APG23-3)

**7.1 Regional Groups**

**7.1.1 ASMG** - **Document APG23-3/**[**INF-37**](https://www.apt.int/sites/default/files/2021/11/APG23-3-INF-37_ASMG_Preparation_for_WRC-23.pdf)

* To follow-up studies of the possibility of using high-altitude platforms as base stations for IMT (HIBS) in the frequency bands referred to in Resolution **247 (WRC-19)** with follow-up studies of sharing and sharing in order to ensure the protection of existing services to which the frequency band is allocated on a primary basis and services operating in adjacent bands as appropriate, in addition to the measures required for coordination with neighboring countries regarding exceeded coverage.
* To protect existing systems and the future development of services to which bands are allocated on a primary basis and services operating in neighboring bands as necessary.
* To continue studying the spectrum requirements of high-altitude platform stations as base stations for IMT (HIBS), while not imposing additional regulatory or technical restrictions on mobile communications systems and determining the position on the possibility of using these applications in the bands mentioned in Resolution **247 (WRC-19)** in the upcoming ASMG meetings.

**7.1.2 ATU** - **Document APG23-3/**[**INF-39**](https://www.apt.int/sites/default/files/2021/11/APG23-3-INF-39_Report_of_APM23-2.docx)

* Support studies to enable the use of HIBS in bands below 2700 MHz, already identified for IMT.
* Support the ITU-R sharing and compatibility studies for HIBS usage and protection of existing co-primary and primary services in adjacent bands without adversely affecting these services,
* Support, based on the result of studies, the global/regional harmonization on the use of the frequency bands for HIBS, which may include addition of African countries names in the existing footnotes in the RR.

**7.1.3 CEPT** - **Document APG23-3/**[**INF-20**](https://www.apt.int/sites/default/files/2021/11/APG23-3-INF-20_Status_of_CEPT_Preparation_for_WRC-23_and_RA-23.pdf)

* To be developed.

**7.1.4 CITEL** - **Document APG23-3/**[**INF-03**](https://www.apt.int/sites/default/files/2021/11/APG23-3-INF-03Rev.1_Briefing_on_AI1.4.docx) **(Rev.1)**

* Some administrations support studies on WRC-23 agenda item 1.4, in accordance with Resolution **247 (WRC-19)**.
* Some administrations consider that modifications to the identifications to IMT (RR Nos. **5.286AA**, **5.317A**, **5.341A**, **5.341B**, **5.341C**, **5.346**, **5.346A**, **5.384A** and **5.388**) in the Radio Regulations are outside the scope of WRC-23 Agenda Item 1.4; there should be no additional regulatory or technical constraints imposed on the deployment of terrestrial IMT in the frequency bands referred to in those footnotes.

**7.1.5 RCC** - **Document APG23-3/**[**INF-03**](https://www.apt.int/sites/default/files/2021/11/APG23-3-INF-03Rev.1_Briefing_on_AI1.4.docx) **(Rev.1)**

* The RCC Administrations consider it necessary to identify the possibility of using HIBS in the frequency bands referred to in Resolution **247 (WRC-19)**, taking into account the protection requirements for incumbent services, in these and adjacent frequency bands, based on the result of compatibility studies carried out by ITU-R.

**7.2 International Organisations**

**7.2.1 ICAO** - **Document APG23-3/**[**INF-15**](https://www.apt.int/sites/default/files/2021/10/APG23-3-INF-15_ICAO-Position_for_ITU_WRC-23.docx)

* To ensure that high‑altitude platform stations as IMT‑base stations (HIBs) sharing and compatibility studies performed under Resolution **247 (WRC-19)** address the protection of aeronautical systems operating in the frequency bands 960-1 164 MHz and 2 700-2 900 MHz.
* In particular, to oppose the use of HIBS within the frequency band 2 500-2 690 MHz or parts thereof where agreed studies have not demonstrated that the signal levels from the HIBS will be below the predicted levels from the ground based IMT studies.

**7.2.2 WMO** - **Document APG23-3/**[**INF-01**](https://www.apt.int/sites/default/files/2021/10/APG23-3-INF-01_Preliminary_WMO_Position_on_WRC-23_Agenda.docx)

* WMO is of the opinion that studies must be conducted to specify the HIBS out-of-band unwanted emissions to prevent interference:
	+ - to meteorological radars in the 2700-2900 MHz band from HIBS operated in the 2500-2690 MHz band,
		- to MetSat service in the 1675-1710 MHz from HIBS operated in the 1710-1885 MHz band. This is important to ensure the protection of the downlink of the measured data as well as the global dissemination of the data directly to the users,
		- to the EESS/SOS in the 2025-2110 MHz band.