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| **The 5th Meeting of the APT Conference Preparatory****Group for WRC-19 (APG19-5)** | **APG19-5/OUT-28**  |
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Working Party 1

 **APT VIEW AND PRELIMINARY APT COMMON PROPOSAL**

**on WRC-19 agenda item 1.14**

**Agenda Item 1.14:**

*to consider, on the basis of ITU-R studies in accordance with Resolution* ***160 (WRC‑15),*** *appropriate regulatory actions for high-altitude platform stations (HAPS), within existing fixed-service allocations;*

Resolution **160 (WRC‑15)** – *Facilitating access to broadband applications delivered by high‑altitude platform stations*

**1. Background**

**1.1 Relevant ITU-R studies**

* Draft new Report F.[HAPS-39GHz] on sharing and compatibility studies of HAPS systems in the 38-39.5 GHz frequency range, as contained in Document [5/160](https://www.itu.int/md/R15-SG05-C-0160/en);
* Draft new Report ITU-R F.[HAPS-25GHz] on sharing and compatibility studies of HAPS systems in the fixed service in the 24.25-27.5 GHz frequency range, as contained in Document [5/161](https://www.itu.int/md/R15-SG05-C-0161/en);
* Draft new Report F.[HAPS-47GHz] on sharing and compatibility studies of HAPS systems in the fixed service in the 47.2-47.5 GHz and 47.9-48.2 GHz frequency ranges, as contained in Document [5/162](https://www.itu.int/md/R15-SG05-C-0162/en);
* Draft new Report ITU-R F.[HAPS-21GHz] on sharing and compatibility studies of HAPS systems in the fixed service in the 21.4-22 GHz frequency range for Region 2, as contained in Document [5/163](https://www.itu.int/md/R15-SG05-C-0163/en);
* Draft new Report ITU-R F.[HAPS-31GHz] on sharing and compatibility studies of HAPS systems in the fixed service in the 27.9-28.2 GHz and 31.0-31.3 GHz frequency ranges, as contained in Document [5/164](https://www.itu.int/md/R15-SG05-C-0164/en);

The ITU has published the following Recommendations on HAPS usage in 47.2–47.5 GHz and 47.9‑48.2 GHz bands: [F.1500](http://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.1500), [F.1501](http://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.1501), [F.1608](http://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.1608), [F.1764](http://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.1764), [F.1819](http://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.1819), [F.1820](http://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.1820), [P.1409](http://www.itu.int/rec/R-REC-p/recommendation.asp?lang=en&parent=R-REC-P.1409), [SF.1481](http://www.itu.int/rec/R-REC-SF/recommendation.asp?lang=en&parent=R-REC-SF.1481), [SF.1843](http://www.itu.int/rec/R-REC-SF/recommendation.asp?lang=en&parent=R-REC-SF.1843).

The ITU has published the following Recommendations on HAPS usage in the 27.9-28.2 GHz and 31.0-31.3 GHz band: [F.1569](http://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.1569), [F.1570](http://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.1570), [F.1607](http://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.1607), [F.1609](http://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.1609), [F.1612](http://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.1612), [F.1764](http://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.1764), [P.1409](http://www.itu.int/rec/R-REC-p/recommendation.asp?lang=en&parent=R-REC-P.1409), [SF.1601](http://www.itu.int/rec/R-REC-SF/recommendation.asp?lang=en&parent=R-REC-SF.1601).

The ITU has published the following Reports and Recommendations on HAPS usage in the 6 440‑6 520 MHz (HAPS-ground) and 6 560-6 640 MHz (ground-HAPS) band: [F.2240](http://www.itu.int/pub/R-REP-F/publications.aspx?lang=en&parent=R-REP-F.2240), [F.1764](http://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.1764), [F.1891](http://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.1891), [F.2011](http://www.itu.int/rec/R-REC-F/recommendation.asp?lang=en&parent=R-REC-F.2011), [P.1409](http://www.itu.int/rec/R-REC-p/recommendation.asp?lang=en&parent=R-REC-P.1409), F.2437.

The ITU has publish the following Reports on HAPS usage in sharing and compatibility studies: F.2438, F.2439.

**1.2 Methods to satisfy the Agenda Item**

The following methods are outlined in the draft CPM Report to satisfy WRC-19 agenda item 1.14 for the nine corresponding frequency bands under study:

**Method A** The existing provisions in the Radio Regulations remain unchanged in the corresponding frequency band.

**Method B** Identification of bands or parts thereof in accordance with Resolution **160 (WRC-15)** with options:

**Method B1** Revision of the regulatory provisions for HAPS in the fixed service with a primary status in bands already designated for HAPS

**Method B2** Add new identification(s) for HAPS in bands already allocated to the fixed service with a primary status

**Method B3** Add a primary allocation to the fixed service and a new identification for HAPS in the band 24.25-25.25 GHz (Region 2) not already allocated to the fixed service

**Method C** Suppress the existing HAPS identification, pursuant to *resolves* 3 of Resolution **160 (WRC-15)**

**Summary of methods to satisfy the agenda item and associated frequency bands**

| **No.** | **Frequency Bands** | **Methods and Options** |
| --- | --- | --- |
| **Method A** | **Method B** | **Method C** |
| 1 | 6 440-6 520 MHz | √ | B1 | √ |
| 2 | 6 560-6 640 MHz | √ | Not proposed | √ |
| 3 | 21.4-22 GHz (R2 only) | √ | B2 | N/A |
| 4 | 24.25-25.25 GHz (R2 only) | √ | B3 | N/A |
| 5 | 25.25-27.5 GHz (R2 only) | √ | B2 | N/A |
| 6 | 27.9-28.2 GHz | √ | B1 | √ |
| 7 | 31.0-31.3 GHz | √ | B1 | √ |
| 8 | 38-39.5 GHz | √ | B2 | N/A |
| 9 | 47.2-47.5 GHz / 47.9-48.2 GHz | √ | B1 | √ |

**2. Documents**

* Input Documents:

APG19-5/INP-11(Rev.1) (SMO, VUT), INP-16 (NZL), INP-28 (IRN), INP-42 (AUS), INP-48 (KOR, SNG); INP-49 (INS); INP-65 (CHN), INP-74 (J), INP-102 (THA); INP-117 (VTN), INP-133 (IND)

* Information Documents:

APG19-5/INF-01 (WMO), INF-02 (ICAO), INF-10 (GSA), INF-18 (CEPT), INF-19 (ATU), INF-20 (CITEL), INF-22 (RCC)

**3. Summary of discussions**

**3.1 Summary of APT Members’ views**

**3.1.1 Samoa and Vanuatu (Rep. of)** - **Document APG19-5/INP-11 (Rev.1)**

Administrations of Samoa and Vanuatu (Rep. of) are supportive of new technologies that seek to provide broadband connectivity in underserved regions and therefore support, the sharing and compatibility studies under Agenda item 1.14 in accordance with Resolution **160 (WRC-15)** while ensuring the protection of existing services.

Administrations of Samoa and Vanuatu (Rep. of) recommend that any identification of additional HAPS spectrum in FS bands in the 27.9-28.2 GHz band under Agenda Item 1.14 should be made with regulatory conditions that HAPS ground stations cannot claim protection from FSS earth stations. This will ensure the avoidance of undue constrains to the future deployment of FSS. This position can be executed through method No Change or method 6B1 Option 2 in the CPM Report, or a potential modification of method 6B1 Option 1 acknowledging that HAPS grounds cannot claim protection from FSS earth stations.

**3.1.2 New Zealand** - **Document APG19-5/INP-16**

New Zealand supports the need to review existing High Altitude Platform Stations (HAPS) identifications that have not been fully utilised before identifying any possible new HAPS frequency bands.

For frequency bands 6 440-6 520 MHz and 6 560-6 640 MHz, New Zealand has no intention to add its name to RR No. **5.457** but does not oppose the identification of the band for HAPS for other countries or on a regional basis.

For frequency bands 21.4-22 GHz and 24.25-27.25 GHz, New Zealand being a Region 3 country does not have a view on identifying these bands for HAPS in Region 2.

For frequency bands 27.9-28.2 GHz and 31.0-31.3 GHz, New Zealand has no intention to add its name to RR Nos. **5.537A** and **5.543A**, respectively, but does not oppose the identification of the band for HAPS by other countries or on a regional basis.

For frequency band 38-39.5 GHz, New Zealand does not oppose the use of this band for HAPS, as the studies demonstrate that possible new HAPS identification would not restrict the consideration of the overlapping frequency band for possible IMT identification with respect to WRC-19 Agenda item 1.13.

For frequency bands 47.2-47.5 GHz and 47.9-48.2 GHz, New Zealand is exploring possible uses of these bands and could support Method B1 (possible modifications to Resolution **122** **(Rev. WRC-07)**).

**3.1.3 Iran (Islamic Republic of)** - **Document APG19-5/INP-28**

This Administration believes that the current identification of frequency band for HAPS is sufficient to satisfy the demands of Administrations considering the economic and regulatory aspects of these systems. Therefore, this Administration prefers No change of radio regulations with regard to the frequency band identified for the HAPS.

However, it is to be emphasized that the band(s) already allocated to fixed service on primary basis or to be allocated by WRC-19 for fixed service on primary, if identified/designated for HAPS, such identification/designation should be on primary basis due to the fact that apart from huge investment on the HAPS itself; it is very improbable that any user invest for a service, which is on secondary basis.

**3.1.4 Australia** - **Document APG19-5/INP-28**

Australia supports consideration of use of gateway and fixed terminal links for HAPS in the frequency band 38-39.5 GHz on a global basis noting this band is already allocated to the fixed service on a primary basis and is not subject to RR Appendices **30**, **30A**, and **30B** in any region. This is addressed by Method B Option B2.

**3.1.5 Korea (Rep. of) and Singapore** - **Document APG19-5/INP-48**

The Republic of Korea and Singapore supports Method A for no changes to the Radio Regulations in the frequency bands 27.9-28.2 GHz and 38-39.5 GHz in order to ensure protection of the mobile service and its future development in these frequency bands.

In addition, these APT members are also of the view that any consideration of the frequency band 24.25-27.5 GHz in Region 2 under this agenda item should not limit the possibility to identify the band for IMT on a global basis under Agenda item 1.13.

**3.1.6 Indonesia (Rep. of)** - **Document APG19-5/INP-49**

Indonesia is of the view that:

(1) Method A (no change) is supported to satisfy Agenda Item 1.14 of WRC-19 for the frequency bands 6 440-6 520 MHz, 6 560–6 640 MHz, 27.9–28.2 GHz, 31.0–31.3 GHz, and 38–39.5 GHz.

(2) Method 9B1 is supported for the frequency band 47.2–47.5 GHz / 47.9–48.2 GHz.

(3) There is a need to review the existing High-Altitude Platform Stations (HAPS) designations in Radio Regulations that have not been fully utilised before designating any possible new frequency bands for HAPS.

**3.1.7 China (People’s Rep. of)** - **Document APG19-5/INP-65**

According to Resolution **160 (WRC-15)**, the primary purpose of HAPS application is to provide broadband services in rural and remote areas lacking of terrestrial telecommunication infrastructures. Also, HAPS can provide emergency communications services to the public while other communications infrastructure were broken. For these purposes, the spectrum requirements for such HAPS applications could be satisfied by identifying 300 MHz bandwidth for downlink and uplink direction respectively (i.e. 600 MHz in total), as showed in Report ITU-R F.2438.

Noticing that the existing HAPS identifications have not been fully utilized, China considers that the HAPS requirement should be primarily satisfied by existing identifications. Since the rain attenuation in low latitude region is a severe problem, the frequency band 27.9-28.2GHz and 31-31.3GHz is a better choice than the bands 47.2-47.5GHz and 47.9-48.2GHz.

According to the studies conducted by ITU-R WP 5C, China proposes the following proposals to be included in the PACP:

- Support Method 1A for the frequency bands 6 440-6 520 MHz and 6 560-6 640 MHz, i.e. no change for existing identification.

- Support Method 6B1 Opiton2 for frequency band 27.9-28.2 GHz. Support Method 7B1 Option1b for frequency band 31-31.3GHz. Worldwide identification for transmission from HAPS (downlink direction) in the band 27.9-28.2 GHz and to HAPS (uplink direction) in the band31-31.3 GHz. Such use of the fixed-service allocation by HAPS is subject to the provisions of Resolution **[APT-A114] (WRC-19)**.

- For frequency band 38-39.5 GHz, no consensus was achieved due to the significant divergence between sharing and compatibility study results from different administrations. Besides, no sharing study was conducted so far to address the overlap issue between HAPS and potential IMT identification under Agenda Item 1.13. Thus, China opposes to identify the 38-39.5 GHz band for HAPS, i.e. choosing Method 8A (NOC).

**3.1.8 Japan** - **Document APG19-5/INP-74**

Japan is of the view that existing services are properly protected and are not imposed any additional constrains.

The frequency bands 27.9-28.2 GHz, 31-31.3 GHz and 47.2-47.5 GHz / 47.9-48.2 GHz are already allocated to HAPS in Japan based on RR. Regarding 6440-6520 MHz and 38-39.5 GHz which have not been allocated to HAPS yet in Japan, coexistence between HAPS and existing services may be feasible taking into account the above-mentioned new ITU-R Reports on sharing and compatibility study and the condition that HAPS is used only in the ground-to-HAPS direction in 38-39.5 GHz.

Japan supports the following Method in each frequency band related to Region 3 given that existing services are properly protected and are not imposed any additional constrains.

* 6440-6520 MHz : Method B1
* 27.9-28.2 GHz : Method B1
* 31-31.3 GHz : Method B1
* 38-39.5 GHz : Method B2 (except Option 1a)
* 47.2-47.5 GHz / 47.9-48.2 GHz: Method B1

**3.1.9 Thailand** - **Document APG19-5/INP-102**

For the bands that are designated for use by HAPS globally (47.2-47.5/47.9-48.2 GHz) and those that may be used by HAPS in some administrations including Thailand (27.9-28.2 GHz and 31-31.3 GHz), Thailand does not support Method C.

**3.1.10 Viet Nam (Socialist Rep. of)** - **Document APG19-5/INP-117**

The frequency bands 27.9-28.2 GHz and 38-39.5 GHz are in use or planned for mobile system in some countries, including Viet Nam. The band 38-39.5 GHz is a candidate band to identify for IMT under agenda item 1.13.

Viet Nam strongly support Method C, could support Method B1 for the band 27.9-28.2 GHz. Regarding to the band 6440-6520 MHz, 6560-6640 MHz and 39-39.5 GHz, Method A is supported.

**3.1.11 India (Rep. of)** - **Document APG19-5/INP-133**

Method/Option Remark

 A No change in the RR. Frequency bands 6 440-6 520 MHz

 A No change in the RR. Frequency bands 6 560-6 640 MHz

 A No change in the RR. Frequency bands 27.9-28.2 GHz

 A No change in the RR. Frequency bands 31-31.3 GHz

 A No change in the RR. Frequency bands 38-39.5 GHz

 A No change in the RR. Frequency bands 47.2-47.5 GHz / 47.9-48.2 GHz

Reasons: For utilization of HAPS application India has already identified 27.9-28.2 GHz and 31.0-31.3 GHz bands through footnote **5.537A** and **5.543A**.

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

Some APT Members support Method A in the frequency band 27.9-28.2 GHz.

Some other APT Members support Method B in the frequency band 27.9-28.2 GHz.

In addition to the above, some APT Members are of the views that if Method B is considered in frequency band 27.9-28.2 GHz for the use of fixed service allocation by HAPS, should not cause harmful interference to nor claim protection from other type of fixed service or co-primary services.

**4. APT View(s)**

APT Members support no changes to the Radio Regulations (Method A as contained in the CPM Report) to ensure protection of all existing services to which frequency bands are allocated and their future development in the frequency bands 6 440-6 520 MHz and 6 560-6 640 MHz.

In addition, APT Members are of the view that any consideration of the frequency band 24.25-27.5 GHz in Region 2 under this agenda item should not limit the possibility to identify the band for IMT on a global basis under WRC-19 Agenda item 1.13.

APT Members consider that protection of all existing services to which frequency bands are allocated and their future development should be ensured.

No consensus was reached on any Method to address this agenda item in the frequency bands 27.9-28.2 GHz, 31-31.3 GHz, 38-39.5 GHz, 47.2-47.5 GHz and 47.9-48.2 GHz, thus no PACP was agreed in these frequency bands.

**5. Preliminary APT Common Proposal(s)**

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