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| APTlogogreen3 | ASIA-PACIFIC TELECOMMUNITY | **Document:** |
| **The 2nd Meeting of the APT Conference Preparatory Group for WRC-19 (APG19-2)** | **APG19-2/OUT-32** |
| 17 – 21 July 2017, Bali, Republic of Indonesia | **21 July 2017** |

Working Party 1

**PRELIMINARY VIEWs 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*

**1. Background**

**Resolution 160 (WRC-15)** “Facilitating access to broadband applications delivered by high-altitude platform stations”

resolves to invite ITU‑R

1. to study additional spectrum needs for gateway and fixed terminal links for HAPS to provide broadband connectivity in the fixed service taking into account:

* the existing identifications and deployments of HAPS systems;
* the deployment scenarios envisioned for HAPS broadband systems and related requirements such as in remote areas;
* the technical and operational characteristics of HAPS systems, including the evolution of HAPS through advances in technology and spectrally-efficient techniques, and their deployment;

1. to study the suitability of using the existing identifications in recognizing c), on a global or regional level, taking into account the regulatory provisions, such as geographical and technical restrictions associated with existing HAPS identifications based on the study performed in resolves to invite ITU‑R 1;
2. to study appropriate modifications to the existing footnotes and associated resolutions in the identifications in recognizing c) in order to facilitate the use of HAPS links on a global or regional level, limited to the currently identified frequency bands and, where the use of an identification is not technically feasible for HAPS use, the possible removal of the unsuitable identification;
3. to study, in order to meet any spectrum needs which could not be satisfied under resolves to invite ITU‑R 1 and 2, for the use of gateway and fixed terminal links for HAPS, the following frequency bands already allocated to the fixed service on a primary basis, not subject to Appendices 30, 30A, and 30B in any region:

* on a global level: 38-39.5 GHz, and
* on a regional level: in Region 2, 21.4-22 GHz and 24.25-27.5 GHz,

further resolves

1. that the studies referred to in *resolves toinvite ITU‑R* 3 and 4 include sharing and compatibility studies to ensure protection of existing services allocated in the frequency ranges identified and, as appropriate, adjacent band studies, taking into account studies already performed in ITU‑R;
2. that modifications studied under *resolves toinvite ITU‑R* 3 shall not consider the use of HAPS links in the frequency bands subject to Appendix **30B**;
3. to develop ITU‑R Recommendations and Reports, as appropriate, on the basis of the studies called for in *resolves toinvite ITU‑R*1, 2, 3, and 4 above,

…

resolves to invite the 2019 World Radiocommunication Conference

to consider the results of the above studies and take necessary regulatory actions, as appropriate, provided that the results referred to in *resolves to invite ITU‑R* are complete and agreed by ITU-R study groups.

Relevant ITU-R on going studies are as follows,

* WD toward draft CPM text on WRC-19 agenda item 1.14 (5C/292-E Annex 15)
* WD towards a PDN Report ITU-R F.[HAPS-SPECTRUM-NEEDS] (5C/292-E Annex 12)
* WD towards a PDN Recommendation ITU-R F.[BROADBAND HAPS CHARACTERISTICS] (5C/292-E Annex 14)
* WD on Sharing and compatibility studies of HAPS systems. (5C/292-E Annex 20, 21, 22, 23, 24, and 25)
* WD on the methodologies of sharing and compatibility studies for HAPS in the bands considered under Resolution 160, Agenda Item 1.14 (WRC-19) (5C/292-E Annex 26)

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)

**2. Documents**

* Input Documents:

APG19-2/INP-08 (KOR), INP-18 (SNG), INP-20 (NZL), INP-28 (AUS), INP-34 (IRN), INP-39 (INS), INP-49 (CHN), INP-55 (J).

* Information Documents: APG19-2/INF-01 (Chairman, APG-19), APG19-2/INF-02 (ICAO), APG19-2/INF-04(CITEL), APG19-2/INF-05 (RCC),APG19-2/INF-07 (ATU), APG19-2/INF-14 (CEPT)

**3. Summary of Discussions**

**3.1 Summary of Members’ view**

**3.1.1 Korea**

The Republic of Korea supports the relevant ITU-R studies with regard to spectrum needs and regulatory provisions for gateway station and fixed terminal links for HAPS to provide broadband connectivity in the fixed service taking into account frequency bands which have been already identified or designated for HAPS. The Republic of Korea also supports the ITU-R studies on sharing and compatibility between HAPS and the other services, in order to ensure protection of current and future development of existing services.

**3.1.2 Singapore**

Singapore recognises the potential of HAPS as a technology for delivering broadband connectivity and better communications integration throughout Southeast Asia and to all unserved and underserved communities. Singapore believes that HAPS can serve as an effective complement to terrestrial and satellite services. Since current allocations have geographical and technical constraints, Singapore supports studies addressing potential spectrum needs, in accordance with Resolution 160 (WRC-15).

**3.1.3 New Zealand**

New Zealand supports the ITU-R studies undertaken in accordance with Resolution 160 (WRC-15) in order to justify spectrum needs for High Altitude Platform Stations (HAPS), taking into account existing frequency bands that have already been identified for HAPS in the Radio Regulations.

If spectrum needs could not be satisfied within those existing HAPS identifications, any consideration for possible new HAPS identification should not restrict the consideration of the overlapping frequency bands for possible IMT identification with respect to WRC-19 Agenda item 1.13.

**3.1.4 Australia**

Australia supports ITU-R studies of appropriate regulatory actions for high-altitude platform stations (HAPS), including sharing and compatibility studies with existing services allocated in the frequency ranges identified in Resolution 160 (WRC-15), and as appropriate, adjacent band studies.

**3.1.5 Iran**

This Administration is in the opinion that any additional identification for the HAPS links should be based on sufficient ITU-R studies on feasibility of implementations for such kind of application and taking into account the suitability of existing identifications for new spectrum accommodation. Furthermore, the studies shall ensure the protection of the existing services and their future developments without any constraint.

Based on the ongoing activities in the ITU-R and studies being carried out, the above preliminary views may be updated, modified as well as amended.

**3.1.6 Indonesia**

Indonesia is of the view that any frequency band identified for the HAPS links should include sufficient ITU-R studies on the status of the technical and regulatory implementations and shall ensure the protection of the existing services and their future developments.

**3.1.7 China**

China is of the preliminary view that:

1. The spectrum requirements study is very important and determines whether it is necessary to identify new bands for HAPS gateway and fixed terminal links. The spectrum requirements study should take full account of the development of population density and user capacity foreseen in the future and the features and capabilities of both lighter-than-air and heavier-than-air HAPS platforms.
2. If it is necessary to identify new bands for HAPS, the related regulatory actions should be studied, to ensure the protection of existing services allocated in these and adjacent frequency bands.

**3.1.8 Japan**

Japan is of the view that the adequate protection of the existing services is important. Japan supports the studies being conducted in ITU-R in accordance with Resolution 160 (WRC-15).

**3.2 Key points raised during the meeting**

* Consideration of issues relating to overlapping frequency bands with Agenda Item 1.6 and 1.13.
* The modification of existing footnotes may lead to consequential compatibility studies.

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

* APT Members support the ITU-R studies undertaken in accordance with Resolution 160 (WRC-15) to study spectrum needs for High Altitude Platform Stations (HAPS), taking into account existing frequency bands that have already been identified for HAPS in the Radio Regulations and appropriate regulatory actions.
* APT Members also support sharing and compatibility studies between HAPS and other services to ensure protection of services to which frequency bands are allocated without any constraint to these services in accordance with Resolution 160 (WRC-15).

**5. Other Views**

None.

**6. Views from Other Organisations**

* **CITEL**

**Brazil:** Brazil supports studies in accordance to Resolution 160 (WRC-15). Provided that these studies demonstrate sharing and compatibility with existing services and candidate applications are feasible, and future development of existing services is considered, Brazil supports appropriate regulatory actions, including addressing additional spectrum needs for HAPS.

**United State**: In order to facilitate the use of HAPS links on a global or regional level, the United States supports studies, in accordance with Resolution 160 (WRC-15), and appropriate WRC-19 action based on the results of these studies, including possible modifications to the existing provisions on HAPS identifications in the Radio Regulations and possible new HAPS identifications in the fixed service bands at 21.4-22 GHz and 24.25-27.5 GHz in Region 2, and 38-39.5 GHz globally.

* **RCC**
* The RCC Administrations support the need to justify spectrum requirements for gateway station and fixed terminal links for HAPS to provide broadband connectivity in the fixed service taking into account frequency bands which have been already identified for HAPS.
* The RCC Administrations support necessary modifications to existing RR Article 5 footnotes and related WRC Resolutions to facilitate HAPS development at global or regional level.
* The RCC Administrations consider that in the case of modification to conditions for use of frequency bands authorized for HAPS or identification of new frequency bands for gateway station and fixed terminal links for HAPS, the protection and the possibility of further development shall be ensured for existing services, including other applications of fixed service, having allocations in these and adjacent frequency bands.
* **ATU**

APM19-1 considered that there is need to consider the utilization of frequency bands already identified for HAPS in Article 5 of RR. Also studies should consider protection of incumbent services and systems of fixed and mobile services, this protection has been implemented in previous bands identified for HAPS.

* **ASMG**

ASMG doesn’t support any additional identifications to applications of HAPS irrespective of results of ongoing studies under AI 1.6 and AI 1.13.

* **CEPT**
* CEPT support consideration of this Agenda Item in accordance with Resolution 160 (WRC-15) while taking into account in particular:
  + The developments and requirements in HAPS in the fixed service and the associated spectrum sharing aspects
  + The need to ensure there is protection in place in order not to limit the possibility to use and develop existing services including other applications of the fixed service in the frequency bands identified and, as appropriate, in the adjacent bands.
* CEPT has initiate studies on spectrum needs for broadband connectivity HAPS applications.
* CEPT is of the view that any consideration of the frequency band 24.25-27.5 GHz under this Agenda Item should not limit the possibility to identify the band for IMT on global level under Agenda Item 1.13.
* **ICAO**

If agreed ITU-R studies demonstrate there is no adverse impact on aeronautical systems including those used for the safe operation of the platform on which the HAPS resides, then support the use of fixed service allocations for HAPS provided that any regulatory actions taken within the existing allocations to the fixed service noted in Resolution 160 (WRC-15) do not constrain the potential future use of those HAPS fixed links as part of aeronautical communication systems (e.g. VSAT enhancement).

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

APT Members are encouraged to contribute on this agenda item to APG19-3.

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