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| **World Radiocommunication Conference (WRC-19)Sharm el-Sheikh, Egypt, 28 October – 22 November 2019** |  |
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| PLENARY MEETING | **Addendum 4 toDocument 24(Add.24)-E** |
|  | **20 September 2019** |
|  | **Original: English** |
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| Asia-Pacific Telecommunity Common Proposals |
| Proposals for the work of the conference |
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| Agenda item 10 |

10 to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, in accordance with Article 7 of the Convention.

Introduction

APT Members support the inclusion of the following item in the agenda of WRC-23:

– to consider identification of certain frequency bands below 2.7 GHz identified for IMT for use by high altitude platform station as IMT base stations (HIBS), and whether changes are needed to the set of existing bands identified for use by HIBS.

Proposals

ADD ACP/24A24A4/1

Draft New Resolution [ACP-A10-WRC23] (WRC-19)

Agenda for the 2023 World Radiocommunication Conference

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

…

1.x to consider identification of certain frequency bands below 2.7 GHz identified for IMT for use by high altitude platform station as IMT base stations (HIBS), and whether changes are needed to the set of existing bands identified for use by HIBS in accordance with Resolution **[ASP-D10-HIBS]** **(WRC-19)**;

**Reasons:** Proposal for a new WRC-23 agenda item to consider identification of certain frequency bands below 2.7 GHz identified for IMT for use by HIBS.

ADD ACP/24A24A4/2

Draft New Resolution [ACP-D10-HIBS] (WRC-19)

Facilitating mobile connectivity using high altitude platform stations
as IMT base stations (HIBS)

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

considering

*a)* that studies on how to facilitate access to global broadband applications delivered by high altitude platform stations in the fixed service were conducted under WRC-19 agenda item 1.14 based on Resolution **160 (WRC-15)** in the frequency bands above 6 GHz;

*b)* that high altitude platform station may also be used as IMT base stations (HIBS) within the mobile service in the frequency bands below 2.7 GHz to expand mobile connectivity utilizing its capability to provide service to a large footprint at low latency;

*c)* that with recent technological advances (such as battery and solar-panel technologies) HIBS have become feasible;

*d)* that HIBS may be used as a part of terrestrial IMT networks to provide mobile connectivity to underserved communities and in rural and remote areas where it is difficult to be covered by ground-based IMT base stations at a reasonable cost;

*e)* that user terminals can be connected to HIBS or ground-based IMT base stations using the same frequency bands with spectrum sharing between HIBS and ground-based IMT base stations;

*f)* that many terrestrial IMT networks use multiple frequency bands and thus many user terminals support multiple bands;

*g)* that since the technical and operational characteristics of HIBS in the mobile service have not been specified, studies on the characteristics are required;

*h)* that cross-border interferences may occur when HIBS are deployed using same and adjacent frequency bands;

*i*) that harmful interferences may occur to MSS (Earth-to-space) from HIBS deployed in countries other than immediate neighboring countries as well using same and adjacent frequency bands;

*j)* that some administrations in Region 3 use the certain frequency bands, which globally or regionally identified for IMT below 2.7 GHz, for the mission critical systems, e.g. public safety and disaster relief, and such incumbent services and their planned development require appropriate protection,

recognizing

*a)* that high altitude platform station is defined in No. **1.66A** of the Radio Regulations as a station located on an object at an altitude of 20 to 50 km and at a specified, nominal, fixed point relative to the Earth;

*b)* that transmissions to or from high altitude platform stations shall be limited to bands specifically identified in Article **5** in accordance with No. **4.23**;

*c)* that 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 are identified in RR No. **5.388A** for HIBS and may be used in accordance with Resolution **221 (Rev.WRC-07)**;

*d)* that the use of the frequency bands indicated in *recognizing c)* by IMT applications using high altitude platform stations as base stations does not preclude the use of these bands by any station in the services to which they are allocated and does not establish priority in the Radio Regulations in accordance with No. **5.388A**;

*e)* that Resolution **221 (Rev.WRC-07)** stipulates technical conditions for HIBS for the protection of ground-based IMT stations in neighboring countries and other services based on the sharing and compatibility studies with IMT-2000;

*f)* that some frequency bands below 2.7 GHz are identified for IMT in accordance with Nos. **5.286AA**, **5.295**, **5.296A**, **5.308A**, **5.313A**, **5.317A**, **5.341A**, **5.341B**, **5.341C**, **5.346**, **5.346A**, **5.384A** and **5.388** of the Radio Regulations,

resolves to invite ITU-R

1 to study spectrum needs, as appropriate, for HIBS to provide mobile connectivity in the mobile service taking into account:

– the existing identification in *recognizing b);*

– the usage and deployment scenario envisioned for HIBS as a complementary for terrestrial IMT networks;

– the technical and operational characteristics and requirements of HIBS

2 to conduct study on the technical and operational characteristics and requirements of HIBS;

3 to conduct and complete in time for WRC-23, taking into account the results of studies already performed and in progress in ITU-R, sharing and compatibility studies to ensure protection, and not imposing constraints on, of existing systems and their planned development of allocated services and, as appropriate, adjacent band, for the following frequency bands, or portions thereof, specified in Nos. **5.286AA**, **5.313A**, **5.317A** and **5.384A** of the Radio Regulations;

– 450-470 MHz, 703-960 MHz, 1 710-1 885 MHz (1 710-1 815 MHz is only used for uplink in Region 3) and 2 500-2 690 MHz (2 500-2 515 MHz is only used for uplink in Region 3, 2 655-2 690 MHz is not to be identified for HIBS operations in Regions 1 and 3 and hence shall not be studied for Regions 1 and 3);

4 to study appropriate modifications to the existing footnote and associated resolution in the identification in *recognizing b)* in order to facilitate the use of HIBS with the latest radio interface technologies of IMT;

5 to study the definition of HIBS including possible modifications to the provisions of Radio Regulations;

6 to develop ITU-R Recommendations and Reports, as appropriate, taking into account resolves to invite ITU-R 1, 2, 3, 4 and 5 above,

further resolves to invite WRC-23

to consider the results of the above studies and take necessary regulatory actions, as appropriate, taking into account that changes to the footnotes in the *recognizing f)* are outside of scope.

**Reasons:** The proposed Resolution on the new agenda item to study high altitude platform station as IMT base stations in existing IMT bands below 2.7 GHz aims to provide more flexibility on the use of these bands, in order to address the need to expand coverage and capacity in mobile broadband networks. The study results and potential RR changes would then be discussed at WRC‑23. Please refer to the table below.

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| ***Subject:***Proposal for WRC-23 agenda item to consider identification of certain frequency bands below 2.7 GHz identified for IMT for use by high altitude platform station as IMT base stations (HIBS), and whether changes are needed to the set of existing bands identified for use by HIBS |
| ***Origin:*** Asia-Pacific Telecommunity (APT) |
| ***Proposal:***To study IMT applications using high altitude platform station as base stations. |
| ***Background/reason:***In light of growing demand for broadband, there is a need for a solution to provide broadband access to underserved areas with minimal ground-level infrastructure and maintenance. At WRC-15, Resolution **160 (WRC-15)** was adopted to study how to facilitate access to global broadband applications delivered by high altitude platform station in the fixed service and there is ongoing study under WRC-19 agenda item 1.14 on high altitude platform station using frequency bands above 6 GHz for broadband delivery.At the same time, to utilize its capability to provide service to a large footprint (wider than 30,000 km2) at low latency (1/30 of LEO and 1/1800 of GEO), high altitude platform station may also be used as IMT base stations (HIBS) in the frequency bands below 2.7 GHz to provide mobile connectivity to underserved areas. Especially in providing connectivity for IoT, which is expected to become widespread in 2020 and beyond, mobile network operators (MNOs) are expected to meet the requirement for wider area coverage using their spectrum and at a reasonable cost. Indeed, satellite systems could also achieve wider area coverage, but it is difficult to achieve low latency similar to ground-based IMT network compared to HIBS.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 HIBS in RR No. **5.388A** and Resolution **221 (Rev.WRC-07)** stipulates technical conditions for HIBS necessary for the protection of ground-based IMT stations in neighboring countries and other services based on the sharing and compatibility studies with IMT-2000. Since 2000, there has been tremendous growth in the deployment of IMT systems and significant improvement in its radio access technology (i.e. IMT-Advanced and IMT-2020). Based on this situation, ITU-R WP 5D has initiated co-channel sharing analysis involving IMT-Advanced systems using HIBS in accordance with RR No. **5.388A**. However, this study does not intend to review the existing identification in RR, and therefore focuses on technical analysis of pfd values which can be exceeded if explicit agreement of the affected administration is provided as stipulated in the existing Resolution **221** **(Rev.WRC-07)**. In view of these advancements, it should be studied whether any changes are necessary to the existing identification for HIBS.Moreover, HIBS is expected to be used as a part of terrestrial IMT networks and may use the same frequency bands with ground-based IMT base stations. Currently many terrestrial IMT networks are using multiple frequency bands and thus many user terminals support multiple bands. Therefore, to allow flexible use of frequency bands for HIBS, additional identification for HIBS may be required within existing bands in the frequency ranges below 2.7 GHz identified for IMT.Meanwhile, this proposed new agenda item is to propose consideration of additional identification of frequency bands for use by IMT base stations under the existing definition of HAPS (HIBS). However, the definition in the RR needs to be clarified for the use by HAPS in the mobile service considering the following points:* Under WRC-19 agenda item 1.14 (Consideration of HAPS within fixed service allocations), the term ‘high altitude platform station’ itself is recognized as a station in the fixed service and is also used in the CPM Report. Although the term ‘HIBS’ is used in this proposal to distinguish from HAPS in the fixed service, it is still under the current definition of ‘high altitude platform station’ and may be misunderstood as a station in the fixed service.
* According to RR No. **1.66A**, high altitude platform station is located at an altitude of 20 to 50 km. However, some stratospheric platform stations that carry HIBS, which is a station for mobile service, maintain their position by flying in circles and may sometimes operate at lower altitudes.
* In the case of HIBS, which is a station for the mobile service, not only fixed links between HIBS and the ground stations but also inter-HIBS links and satellite links are expected to be used for feeder link and how these should be treated under the RR needs to be clarified appropriately.

The appropriate definition of HIBS, which is a station for the mobile service, needs to be considered based on its actual operation in order to clarify these points. As an example, following methods may be considered: * modification of the existing definition in RR No. **1.66A**
* addition of a new definition for a station in the mobile service using stratospheric platform (which may include reference of RR No. **1.66A**)

It is also to be noted that the consideration of definition under this proposed new agenda item is for HIBS, which is a station for the mobile service, and does not directly relate with studies concerning HAPS in Fixed Service under WRC-19 agenda item 1.14, which does not address the review of the existing definition of HAPS. |
| ***Radiocommunication Services concerned:*** Mobile service, fixed service, broadcasting service, mobile-satellite service, and other services |
| ***Indication of possible difficulties:***The proposed bands are widely used for terrestrial and space services on a co-primary basis. |
| ***Previous/ongoing studies on the issue:***Recommendations ITU-R M.1456 and M.1641 provide requirements and studies on the provision of mobile services from high altitude platform station using certain bands around 1.9/2.1 GHz.ITU-R WP 5D is conducting co-channel sharing analysis involving IMT-Advanced systems using HIBS. |
| ***Studies to be carried out by:***ITU-R WP 5D | ***with participation of:***Administrations and Sector members of the ITU-R |
| ***ITU-R Study Groups concerned:***SG5 and other groups |
| ***ITU resource implications, including financial implications (refer to CV 126):***This proposed agenda item will be studied within the normal ITU-R procedures and planned budget. As the responsible group on IMT studies, ITU-R WP 5D usually has meetings three times a year which last 6 days each. |
| ***Common regional proposal:***Yes | ***Multicountry Proposal:*** No***Number of countries:*** |
| ***Remarks*** |

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