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|  | ASIA-PACIFIC TELECOMMUNITY | **Document No:** |
| **The 5th Meeting of the APT Conference Preparatory****Group for WRC-19 (APG19-5)** | **APG19-5/OUT-35****(Rev.1)** |
| 31 July – 6 August 2019, Tokyo, Japan | 5 August 2019 |

Working Party 2

**APT VIEW AND PRELIMINARY APT COMMON PROPOSAL**

**on WRC-19 agenda item 1.16**

**Agenda Item 1.16:**

*to consider issues related to wireless access systems, including radio local area networks (WAS/RLAN), in the frequency bands between 5 150 MHz and 5 925 MHz, and take the appropriate regulatory actions, including additional spectrum allocations to the mobile service, in accordance with Resolution* ***239 (WRC-15)****.*

**1. Background**

Resolution **239 (WRC-15)** calls for ITU-R to study WAS/RLAN technical characteristics and operational requirements in the 5 GHz frequency range. It also calls for ITU-R to perform sharing and compatibility studies between WAS/RLAN applications and incumbent services in the frequency bands 5 150-5 350 MHz, 5 350-5 470 MHz, 5 725-5 850 MHz and 5 850-5 925 MHz while ensuring the protection of incumbent services including their current and planned use, to consider enabling outdoor WAS/RLAN operations in the frequency band 5 150-5 350 MHz, and potential mobile service allocations to accommodate WAS/RLAN operations in the 5 350-5 470 MHz and 5 725-5 850 MHz frequency ranges, and identify potential WAS/RLAN use in 5 850-5 925 MHz frequency range.

In the CPM Report, several methods have been developed to satisfy this agenda item. For the 5 150-5 250 MHz frequency band, six methods (including NOC) are proposed (**A1**, **A2**, **A3**, **A4**, **A5 and A6**); for the 5 250-5 350 MHz and for the 5 350-5 470 MHz frequency bands, only one method (NOC) is proposed (**B** and **C** respectively); for the 5 725-5 850 MHz frequency band, three methods (including NOC) are proposed (**D1**, **D2** and **D3**); and for the 5 850-5 925 MHz frequency band only one method (NOC) is proposed (**E**).

At the 22nd ITU-R Working Party (WP) 5A meeting held from 29 April to 9 May 2019, three Preliminary Draft New Reports on sharing studies for the 5 150-5 250 MHz, 5 350-5 470 MHz and 5 725-5 850 MHz frequency bands were developed (see Annexes 10, 11, 12 to ITU-R WP5A Chairman’s Report 5A/1065).

Among all the sharing study documents, the most complicated one is the document addressing the 5 150-5 250 MHz band. Discussions are mainly focused on whether sharing between WAS/RLANs and the MSS feeder links, ARNS and AMT is possible or not if outdoor operations of WAS/RLANs in this band is allowed. Some studies show that sharing is possible depending on the conditions of mitigation measures; some other studies show that sharing is not possible if WAS/RLANs are allowed outdoor use.

Relevant ITU-R Reports/Recommendations and ongoing studies are as follows,

* Recommendation ITU-R M.1450 - Characteristics of broadband radio local area networks
* Recommendation ITU-R M.1739 - Protection criteria for wireless access systems, including radio local area networks, operating in the mobile service in accordance with Resolution **229 (WRC-03)** in the bands 5 150-5 250 MHz, 5 250-5 350 MHz and 5 470-5 725 MHz
* Recommendation ITU-R M.1652 - Dynamic frequency selection in wireless access systems including radio local area networks for the purpose of protecting the radiodetermination service in the 5 GHz band
* Annex 9 to Working Party 5A Chairman’s Report (Doc. 5A/1065) - PDN Report ITU-R M.[RLAN REQ-PAR] - Technical characteristics and operational requirements of WAS/RLAN in the 5 GHz frequency range
* Annex 10 to Working Party 5A Chairman’s Report (Doc. 5A/1065) – PDN Report ITU-R M.[RLAN SHARING 5 350-5 470 MHz] - Sharing and compatibility studies of WAS/RLAN in the 5 350-5 470 MHz frequency range
* Annex 11 to Working Party 5A Chairman’s Report (Doc. 5A/1065) – PDN Report ITU-R M.[RLAN SHARING 5 150-5 250 MHz] - Sharing and compatibility studies of WAS/RLAN in the 5 150-5 250 MHz frequency range
* Annex 12 to Working Party 5A Chairman’s Report (Doc. 5A/1065) - PDN Report ITU-R M.[RLAN SHARING 5 725-5 850 MHz] - Sharing and compatibility studies of WAS/RLAN in the 5 725-5 850 MHz frequency range

**2. Documents**

* Input Documents: APG19-5/INP-17 (NZL), INP-25 (BGD), INP-37 (IRN), INP-43(Rev.1) (AUS), INP-50 (INS), INP-66 (CHN), INP-78 (J, SNG, BRU), INP-106 (MLA, THA), INP-118 (VTN), INP-128 (KOR)
* Information Documents: APG19-5/INF-01 (WMO), INF-02 (ICAO), INF-03(Rev.1) (IARU), 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 New Zealand** - **Document APG19-5/INP-17**

New Zealand is of the view that the existing regulatory framework applicable to the band 5 150-5 250 MHz, as contained in Resolution **229 (Rev. WRC-12)**, could be reviewed by enabling outdoor WAS/RLAN operation. New Zealand supports Method A3 as outlined in the CPM Report.

In the band 5 725-5 850 MHz, New Zealand already permitted WAS/RLAN operation to share with other ISM applications. Therefore, New Zealand supports a primary Mobile Allocation in this band as proposed in Method D3 by adding New Zealand to a new footnote or to the existing footnote RR No. **5.453**.

In the bands 5 250-5 350 MHz, 5 350-5 470 MHz and 5 850-5 925 MHz, New Zealand supports no change to the Radio Regulations (i.e. Methods B, C and E, respectively).

**3.1.2 Bangladesh -** **Document APG19-5/INP-25**

**Frequency band A, 5 150-5 250 MHz**

Bangladesh supports Method A2 or A3 as outlined in the CPM Report to WRC-19 Agenda item 1.16.

**Frequency band B, 5 250-5 350 MHz**

Method B: No change to the RR

**Frequency band C, 5 350-5 470 MHz**

Method C: No change to the RR

**Frequency band D, 5 725-5 850 MHz**

In the band 5 725-5 850 MHz, Bangladesh already allowed WAS/RLAN operation to share with other ISM applications. Therefore, Bangladesh supports a primary Mobile Allocation in this band as proposed in Method D3 by adding Bangladesh to footnote RR No. **5.453**.

**Frequency band E, 5 850-5 925 MHz**

Method E: No change to the RR

**3.1.3 Iran** - **Document APG19-5/INP-37**

* This administration has following positions in different frequency bands:
	+ Frequency bands 5 250-5 350 MHz, 5 350-5 470 MHz and 5 850-5 925 MHz:

	Position: Endorse NOC method (Methods B, C and E respectively) which is identical to APT preliminary views in APG19-4 meeting.
	+ Frequency band A (5 150-5 250 MHz)

	Position: NOC
	Alternatively and as a compromise solution, instead on NOC Method, this administration could supports MethodsA2 and A3 (Reasons: These methods provide the essential elements for RLAN outdoor operation in the band 5 150-5 250 MHz which are identical with those of in the band 5 250-5 350 MHz)
	Against Method A4 and A5 (Reason: Due to presence of non-vehicular indoor application within the band 5 150-5 250 MHz, this administration believes that restriction of usage to cars and trains is not implementable).
	For the Method A6, this administration has a view that out-of-band emissions can be treated by administrations themselves and there is no need to complicate Resolution.
	+ Frequency band D (5 725-5 850 MHz):

	Position: Supports Method D2 (A new Regional primary MS allocation) (Reason: The RR No. **5.453** applies to this administration. Therefore, addition of new primary MS allocation, as proposed in the CPM Report, would not change regulatory environment for this administration)
	Against Method D3 (Reason: Due to large number of countries seeking primary MS allocation, this method would not be useful and administrations that are not entered to the footnote, would face huge number of inconsistent devices, most likely).

**3.1.4 Australia -** **Document APG19-5/INP-43 (Rev.1)**

Australia supports Methods A1, B, C, D1 and E, no change, in the respective frequency bands 5 150-5 250 MHz, 5 250-5 350 MHz, 5 350-5 470 MHz, 5 725-5 850 MHz and 5 850-5 925 MHz. ITU-R sharing and compatibility studies have failed to confirm that incumbent services would be adequately protected and hence no regulatory actions are required in these frequency ranges.

Australia notes that, in the lower 5 150-5 250 MHz band, Working Party 5A’s final meeting in May, 2019 could not agree on how incumbent services would be protected if the regulatory conditions of Resolution **229 (Rev.WRC-12)** were relaxed, as required by *invites ITU-R b)* of Resolution **239 (WRC-15)**, with sharing and compatibility studies not completed for this frequency band.

**3.1.5 Indonesia -** **Document APG19-5/INP-50**

Indonesia is of the view that:

1. **Method A1** is supported to satisfy Agenda Item 1.16 of WRC-19 for the frequency band 5 150-5 250 MHz;
2. **Method B** is supported to satisfy Agenda Item 1.16 of WRC-19 for the frequency band 5 250-5 350 MHz;
3. **Method C** is supported to satisfy Agenda Item 1.16 of WRC-19 for the frequency band 5 350-5 470 MHz;
4. **Method D2** is supported to satisfy Agenda Item 1.16 of WRC-19 for the frequency band 5 725-5 850 MHz;
5. **Method E** is supported to satisfy Agenda Item 1.16 of WRC-19 for the frequency band 5 850-5 925 MHz.

Those methods are supported considering the impending conditions and stage of networks development in many developing countries, particularly with vast geographical areas, could not be compromised and has to consider other services.

**3.1.6 China -** **Document APG19-5/INP-66**

In Asia-Pacific Region, there are several non-GSO MSS systems which use or plan to use the 5 150- 5 250 MHz band for their feeder uplinks. During WRC-19 study cycle, China has conducted a study which analyzed the interference from the potential outdoor WAS/RLAN operations to one MSS feeder uplink system in the frequency band 5 150-5 250 MHz. The results show that the WAS/RLAN stations will severely interfere with the MSS feeder uplink when the maximum e.i.r.p. of outdoor WAS/RLAN is 1 or 4 Watts.

An additional parametric analysis concludes that if the percentage of outdoor usage of WAS/RLAN is 5.3%, the sharing of WAS/RLAN with the MSS feeder uplink could be feasible when the maximum e.i.r.p. of WAS/RLAN is limited to 80mW, and if the percentage of outdoor usage of WAS/RLAN is limited to 3%, the sharing could be feasible when the maximum e.i.r.p. of WAS/RLAN is limited to 200mW. However, there exist many difficulties on how to limit the percentage or amount of outdoor WAS/RLAN devices. For example, the regulation and control to the WAS/RLAN stations are almost impracticable due to the ease of purchasing and deploying WAS/RLAN devices by individuals or companies. Moreover, considering the large footprints of satellites which normally cover multiple countries, the limitation of the total WAS/RLAN stations in the relevant countries needs numerous coordination work among these countries.

Taking into account the difficulties mentioned above, China supports NOC to the Radio Regulations in the frequency bands 5 150-5 250 MHz.

For the frequency bands 5 250-5 350 MHz, 5 350- 5 470 MHz and 5 850-5 925 MHz, China supports the single NOC method proposed in the CPM Report.

**3.1.7 Japan, Singapore and Brunei Darussalam -** **Document APG19-5/INP-78**

Japan, Singapore and Brunei Darussalam are of the view that existing services should be protected adequately in all the frequency ranges to be considered in this agenda item.

On the other hand, in the light of rapid growth in the demand for WAS/RLANs, additional spectrum for outdoor use is required in order to provide flexible and large coverage for outdoor WAS/RLAN operations, and accordingly relaxing conditions for outdoor use in the 5 150-5 250 MHz band is indispensable to meet these requirements.

Therefore, Japan, Singapore and Brunei Darussalam support enabling outdoor WAS/RLANs operations in the frequency band 5 150- 5 250 MHz with associated conditions to protect the existing services and modifying the Radio Regulations in this regard.

With regard to the Methods for the 5 150-5 250 MHz band, Japan, Singapore and Brunei Darussalam are of the following views:

* The total interference level from WAS/RLANs should be limited to protect existing services, and the conditions should be the same as specified for the adjacent 5 250-5 350 MHz band since these sub-bands may be used at the same time (for example, 160 MHz channel mode in IEEE 802.11ac/ax). Method A3 satisfies these requirements. In addition, some studies show that sharing between outdoor WAS/RLAN operations and the existing services is feasible under certain conditions of Method A3.
* Method A2 and Method A6 may be acceptable since some studies show that sharing between outdoor WAS/RLAN operations with the associated conditions and the existing services is feasible. However, it should be noted that these Methods contain limits of unwanted emissions (the e.i.r.p. threshold of -27 dBm/MHz for Method A2 and Method A6, and the attenuation of 26 dB below the channel power for Method A6) and some WAS/RLAN devices already deployed may not meet these limits since they are not contained in the current Radio Regulations.

Japan, Singapore and Brunei Darussalam support enabling outdoor WAS/RLAN operations in the 5 150-5 250 MHz band provided that existing services are properly protected.

Japan, Singapore and Brunei Darussalam support Method A3 for the 5 150-5 250 MHz band in the CPM Report as described below.

Japan, Singapore and Brunei Darussalam may also support Method A2 or Method A6, if the conditions of unwanted emissions are removed or relaxed based on the results of further studies.

Japan, Singapore and Brunei Darussalam do not support Method A1, Method A4 or Method A5.

Japan, Singapore and Brunei Darussalam also propose to develop a Preliminary APT Common Proposal with support for Method A3 accompanied by the proposed revisions to Resolution **229 (Rev. WRC-12)** as indicated in the CPM Report.

**3.1.8 Malaysia, Thailand -** **Document APG19-5/INP-106**

In the frequency bands 5 250-5 350 MHz, 5 350-5 470 MHz and 5 850-5 925 MHz, Thailand and Malaysia support No Changes to the Radio Regulations (i.e. Methods B, C and E of the CPM Report) for the use of WAS/RLAN to protect the incumbent services.

In the frequency band 5150 – 5250 MHz, Thailand and Malaysia support revision to Resolution **229 (Rev.WRC-12)** to enable outdoor WAS/RLAN operations while having conditions to protect the incumbent services, without unacceptable constraints on these services. In this regard, Thailand and Malaysia prefer Method A3 of the CPM Report.

In the frequency band 5 725-5 850 MHz, some Administrations including Thailand and Malaysia already have a mobile primary allocation in accordance with RR No.**5.453**. Therefore, Thailand and Malaysia invite other Administrations to consider allocation to the mobile service in the band without technical constraints.

**3.1.9 Viet Nam-** **Document APG19-5/INP-118**

Regarding to frequency band D (5 725-5 850 MHz), Viet Nam supports a new mobile allocation to accommodate WAS/RLANs use, with method D2.

**3.1.10 Korea -** **Document APG19-5/INP-128**

The Republic of Korea supports Methods A3 in the CPM Report in general in order to enable outdoor WAS/RLAN operations in the band 5 150-5 250 MHz through revision to Resolution **229 (Rev.WRC-12)**.

The Republic of Korea also supports Method D2 with modification in the CPM Report to make a new regional primary allocation to the mobile service in the band 5 725-5 850 MHz.

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

During the drafting group sessions, some issues have been raised by APT Members as below:

* Regarding the frequency band 5 150-5 250 MHz, some APT Members support Method A3 and consider this method could provide protection to the incumbent services under some conditions and mitigation measures based on some studies, while some other APT Members support Method A1 and consider that Method A3 could not ensure the protection to MSS feeder uplinks, especially due to the unclear effectiveness of the proposed elevation angle mask, the uncertainty on how to apply the registration procedures to the relevant countries and the difficulty to control the total number of the outdoor RLAN devices in multiple countries based on some studies. After a lot of debate as well as offline discussions, no agreement was reached for this frequency band.
* Regarding the frequency band 5 725-5 850 MHz, there are 4 different views proposed by APT Members. After some discussion, all the APT Members could support Method D2 as the PACP for this band. However, some APT Members emphasise that the radars and other incumbent systems operating in this frequency band should be fully protected.

**4. APT View(s)**

* APT Members are of the view that the protection of incumbent services including their current and planned use in the frequency bands 5 150-5 350 MHz, 5 350-5 470 MHz, 5 725-5 850 MHz and 5 850-5 925 MHz should be ensured, without adversely affecting these services.
* In the frequency bands 5 250-5 350 MHz, 5 350-5 470 MHz and 5 850-5 925 MHz, APT Members support NOC to the Radio Regulations for the use of WAS/RLAN to protect incumbent services.
* In the frequency band 5 725-5 850 MHz, APT Members support to allocate the 5 725-5 850 MHz frequency band to the mobile service on a primary basis in Regions 3.
* In the frequency band 5150-5250 MHz, APT Members do not support Method A2, A4, A5 and A6. Moreover no consensus was reached on either Method A1 or A3. However APT Members support further consideration and investigation on the possibility of outdoor WAS/RLANs operation under the condition that incumbent services including the future development of these services are fully protected.

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

