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| APTlogogreen3 | ASIA-PACIFIC TELECOMMUNITY | **Document No:**  |
| **The 3rd Meeting of the APT Conference Preparatory Group for WRC-19 (APG19-3)** | **APG19-3/OUT-30** |
| 12 – 16 March 2018, Perth, Australia | **16 March 2018** |

Working Party 6

**PRELIMINARY VIEWs on WRC-19 agenda item 9.1, ISSUE 9.1.6**

**Agenda Item 9.1, Issue 9.1.6:**

*9 to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention:*

*9.1 on the activities of the Radiocommunication Sector since WRC-15;*

*9.1.6 Issue 1) in the annex to Resolution 958 (WRC-15)*

*Urgent studies required in preparation for the 2019 World Radiocommunication Conference:*

*1) Studies concerning Wireless Power Transmission (WPT) for electric vehicles:*

*a) to assess the impact of WPT for electric vehicles on radiocommunication services;*

*b) to study suitable harmonized frequency ranges which would minimize the impact on radiocommunication services from WPT for electrical vehicles.*

*These studies should take into account that the International Electrotechnical Commission (IEC), the International Organization for Standardization (ISO) and the Society of Automotive Engineers (SAE) are in the process of approving standards intended for global and regional harmonization of WPT technologies for electric vehicles.*

**1. Background**

Wireless power transmission (WPT) technologies are being developed worldwide to support many applications and WPT for electric vehicles (EVs) is one of the promising applications. However, since the WPT for EVs requires relatively high power, it should be developed not to cause harmful interference to radiocommunication services.

The CPM19-1 identified the studies on WPT for EVs as Issue 9.1.6 under Agenda Item 9.1

Report ITU-R SM.2303-2 ‘Wireless power transmission using technologies other than radio frequency beam’ contains various results of technical studies on the impact of WPT, including WPT for EVs, on radiocommunication services.

Recommendation ITU-R SM.2110-0 ‘Frequency ranges for operation of non-beam Wireless Power Transmission (WPT) systems’ was approved in September 2017 and a working document towards a draft revision of the Recommendation, which includes one frequency range for WPT for EVs, was prepared in November 2017.

As a responsible group for Issue 9.1.6, WP 1B is working for a draft CPM Text on this issue, with a completion target at its meeting in June 2018. A working document was developed indicating some frequency ranges, e.g. 19-25, 55-65, 79/81.38-90 kHz. The draft CPM Report text is at an early stage and has no conclusions to date.

WP 1B is also working on a draft new Report ITU-R SM.[WPT-SPEC-MNGM] “Methodology for spectrum management of wireless power transmission (WPT)”.

The studies conducted by WP 1B are underway driven by contribution from a number of members, in cooperation with concerned Working Parties within ITU-R and external organizations e.g. CISPR, IEC, ISO, EBU, IARU and APT(AWG).

**2. Documents**

* Input Documents APG19-3/INP-26 (KOR), 33 (IRN), 46 (AUS), 54 (J), 58 (J),
64 (THA) and 91 (CHN)
* Information Documents APG19-3/INF-06 (CEPT), 09 (IARU)

**3. Summary of discussions**

**3.1 Summary of APT Members’ views**

**3.1.1 Korea (Rep. of)** - **Document APG19-3/INP-26**

The Republic of Korea proposes modifications to the APT Preliminary View adopted at the APG19-2 as stated below:

APT Members support the studies carried out by ITU-R in accordance with Resolution 958 (WRC‑15) to assess the impacts of WPT for electric vehicles on radiocommunication services and to study suitable harmonized frequency ranges which would minimize the impact on radiocommunication services from WPT for electric vehicles. APT Members are of the view that there is no need to change the Radio Regulations (RR).

**3.1.2 Iran (Islamic Republic of)** - **Document APG19-3/INP-33**

This Administration supports the studies carried out by ITU-R in accordance with Resolution 958 (WRC‑15) to assess the impacts of WPT for electric vehicles on radiocommunication services and to study suitable harmonized frequency ranges which would minimize the impact on radiocommunication services from WPT for electric vehicles.

In case of harmonized frequency ranges for WPT for electric vehicles, this Administration is waiting for the completion of ITU-R studies.

**3.1.3 Australia** - **Document APG19-3/INP-46**

Australia supports the studies being carried out by ITU-R in accordance with Resolution 958 (WRC 15) to assess the impacts of WPT for electric vehicles on radiocommunication services, to study suitable harmonized frequency ranges.

Australia is of the view that all radiocommunication services must be adequately protected from harmful interference that may be generated by WPT systems, both at the fundamental frequency and from spurious and out-of-band emissions.

**3.1.4 Japan** - **Document APG19-3/INP-54**

The frequency range 79-90 kHz should be included as a frequency range for WPT for EVs in an ITU-R Recommendation and the Recommendation should be approved at the latest by RA-19; and

Depending on upcoming progress of ITU-R studies, APT should consider the possibilities to propose establishment of provisions of the Radio Regulations (RR) regarding WPT.

**3.1.5 Thailand** - **Document APG19-3/INP-64**

Thailand supports the studies carried out by ITU-R in accordance with Resolution 958 (WRC-15) to assess the impacts of WPT for electric vehicles (EVs) on radiocommunication services. Thailand also supports studies to identify possible harmonized frequency ranges used by WPT for EVs with a prerequisite that the use of WPT for EVs shall not cause harmful interference to incumbent radiocommunication services in adjacent bands.

**3.1.6 China (People’s Republic of)** - **Document APG19-3/INP-91**

China supports the studies carried out by ITU-R in accordance with Resolution 958 (WRC‑15) to assess the impacts of WPT for electric vehicles on radiocommunication services and to study suitable regionally or globally harmonized frequency ranges which would minimize the impact on radiocommunication services from WPT for electric vehicles.

China is considering and studying the 81.38 kHz - 90 kHz band for harmonization of WPT for electric vehicles.

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

The ITU-R studies on this issue are progressing but have not yet come to conclusions. Therefore, APT members’ views diverge; waiting for completion of ITU-R studies, considering and studying different frequency ranges, proposing consideration of possibilities to propose establishment of provisions of the RR, or proposing no change to the RR.

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

* APT Members support the studies carried out by ITU-R in accordance with Resolution 958 (WRC‑15) to assess the impacts of WPT for electric vehicles on radiocommunication services and to study suitable harmonized frequency ranges which would minimize the impact on radiocommunication services from WPT for electric vehicles (EVs).
* APT Members are of the view that all radiocommunication services must be adequately protected from harmful interference that may be generated by WPT for EVs, both at the fundamental frequency and from spurious and out-of-band emissions.
* APT Members support consideration of the inclusion of one or more frequency ranges for WPT for EVs in an ITU-R Recommendation based on completion of ITU-R studies.

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

* Some APT Members are considering and studying or proposing a 79/81.38-90 kHz range as a harmonized frequency range for WPT for EVs.
* One APT Member is of the view that an ITU-R Recommendation on frequency ranges for WPT for EVs should be approved at the latest by RA-19.
* One APT Member is of the view that, depending on upcoming progress of ITU-R studies, APT should consider the possibilities to propose establishment of provisions of the Radio Regulations (RR) regarding WPT for EV and another APT Member is of the view that there is no need to change the RR.

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

* Assessment of outputs of ITU-R SG 1 block meetings to be held in June 2018

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

APG19-3, etc.)

**7.1 Regional Groups**

**7.1.1 ASMG** - **Document APG19-2/INF-01**

* Follow up and support the current studies to assess the impact of (WPT) for electric vehicles on radiocommunication services; and to study suitable harmonized frequency ranges which would minimize the impact on radiocommunication services from (WPT) for electric vehicles.
* Ensure the protection of the incumbent services and not add any additional constraints on these services.
* Request ASMG administrations to identify their current and future uses in the frequency bands proposed in order to ensure the protection of these services in these bands.

**7.1.2 ATU** - **Document APG19-2/INF-07**

No preliminary position on this agenda item yet.

**7.1.3 CEPT** - **Document APG19-3/INF-06**

* **Preliminary CEPT position:**

CEPT supports studies concerning Wireless Power Transmission (WPT) for electric vehicles (EV) to assess the impact of WPT for EV on radiocommunication services.

CEPT will consider only those potential candidate band(s) as suitable for WPT for EV, which minimise the impact of WPT for EV on radiocommunication services.

CEPT is of the view that no further regulatory action to the RR will be required. An ITU-R Report or Recommendation, as appropriate, is considered sufficient to specify suitable frequency bands for WPT for EV.

* **Preliminary ECP**:

NOC

* **Reasons**: An ITU-R Report or Recommendation, as appropriate, is considered sufficient to harmonise suitable frequency ranges which would minimize the impact on radiocommunication services from WPT for electric vehicles.

**7.1.4 CITEL** - **Document APG19-3/INF-08(Rev.1)**

* **N/A**

**7.1.5 RCC** - **Document APG19-2/INF-05**

**Preliminary Position on Issue 9.1.6**

* The RCC Administrations are in favour of harmonizing frequency bands to be used for Wireless Power Transmission (WPT) for electric vehicles, which could be implemented by the development of relevant Recommendation ITU-R.
* The RCC Administrations support the development of conditions for use of the frequency bands 19‑21 kHz, 59‑61 kHz, 79‑90 kHz and 100‑300 kHz by WPT devices, which would provide protection to stations of radiocommunication services from possible interference, and which have relevant allocations in the Radio Regulations on a primary or secondary basis.
* The RCC Administrations do not oppose harmonizing the frequency band 6 765‑6 795 kHz for WPT devices.

**Proposal on AI 9.1**

* Understanding that studying the issues under agenda item 9.1, which modify the Radio Regulations, has no direct relation to the Report of the Director of the Radiocommunication Bureau, such issues should not be included into agenda item 9.1 related to the Director’s Report and should be considered as individual agenda items of the next WRC.

**Information extracted from a RCC document ‘Position of the RCC Communications Administrations on agenda items for the WRC-19 (draft, version 14 September, 2017)’** [**http://www.en.rcc.org.ru/about\_en/RCC\_positionWRC-19**](http://www.en.rcc.org.ru/about_en/RCC_positionWRC-19)

* The RCC Administrations are in favour of harmonizing frequency bands to be used for Wireless Power Transmission (WPT) for electric vehicles, which could be implemented by the development of relevant Recommendation ITU-R.
* The RCC Administrations support the development of conditions for use of the frequency bands 19‑21 kHz, 59‑61 kHz, 79‑90 kHz and 100‑300 kHz by WPT devices, which would provide protection to stations of radiocommunication services from possible interference, and which have relevant allocations in the Radio Regulations on a primary or secondary basis.

**7.2 International Organisations**

**7.2.1 IARU** - **Document APG19-3/INF-09**

* The IARU observes that high power Wireless Power Transfer is an emerging technology which will, in time, become deployed on a widespread basis (possibly one in every house) and in car parks, including high rise or multi-storey car parks).
* Since WPT for vehicles involves very large amounts of RF power and a WPT installation involves components connected together in a system with associated power supplies and control equipment, the spurious emissions from all these system parts must be carefully controlled in order to avoid degrading the radio spectrum and causing interference to other radiocommunication systems or services in accordance with RR 15.12 and RR 15.13.
* The IARU is of the view that radio frequency emissions resulting from any kind of WPT system must be confined to the frequency ranges already identified for equipment used for industrial, scientific, and medical applications or if found necessary, to frequencies below 100 kHz. At the same time special attentions should be given to spurious and out of band emissions, including harmonics, from such WPT systems to prevent them from causing harmful interference to the Low Frequency and Medium Frequency amateur bands. Because of the likely high density of WPT(EV) installations and the close co-siting of WPT(EV) and radio receivers used in the domestic environment, modelling shows that the current spurious emission limits in [ITU-R SM.329-12](https://www.itu.int/rec/R-REC-SM.329-12-201209-I/en) fall well short of what is needed to protect radio services operating under Article 5 of the Radio Regulations.
* IARU regards cooperation between ITU and Standards organizations to be essential in the evolution of standards and frequencies for WPT operation.

**7.2.2 ICAO** - **Document APG19-2/INF-02**

* To ensure that the protection of aeronautical systems is appropriately taken into account during the studies called for in response to Resolution 958 (WRC-15).

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