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|  | | Doc. CPG(17)011 ANNEX IV-21F |
| CPG19-3 | | |
| Vienna, Austria, 14th - 17th March 2017 | | |
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| Date issued: | 17th March 2017 | |
| Source: | CPG19-3 minutes | |
| Subject: | Draft CEPT Brief on WRC-19 Agenda Item 9.1, issue 9.1.6 | |
| Summary: | | |
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| Proposal: | | |
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DRAFT CEPT BRIEF ON AGENDA ITEM 9.1 – Issue 9.1.6 – Resolutiom 958 (WRC-15)

Resolution 958 (WRC-15) - Urgent studies required in preparation for WRC-19 - Studies concerning Wireless Power Transmission for electric vehicles

# ISSUE

Resolution 958 (WRC-15) calls to complete ITU-R studies concerning Wireless Power Transmission (WPT) for electric vehicles (EV):

* 1. to assess the impact of WPT for electric vehicles on radiocommunication services;
  2. to study suitable harmonized frequency ranges which would minimize the impact on radiocommunication services from WPT for electrical vehicles.

# Preliminary CEPT position

TBD

# Background

WRC-15 decided to invite ITU-R to undertake and complete the relevant studies on WPT for electric vehicles. Resolution 958 (WRC-15) instructs the Director of the Radiocommunication Bureau to report to WRC-19 on the results of these studies. It was further suggested to take account of the standardisation activities for global and regional harmonization of WPT technologies for electric vehicles currently taking place in the International Electrotechnical Commission (IEC), the International Organization for Standardization (ISO) and the Society of Automotive Engineers (SAE).

CEPT notes that several frequency bands have been chosen for WPT for EV in some APT countries, such as 19‑21 kHz and 59‑61 kHz for the shaped magnetic field resonance technology in Korea and 79‑90 kHz for magnetic resonant technology in Japan. It is also observed that SAE International J2954™ Task Force agreed on the band 81.38-90.00 kHz for light duty vehicle WPT.

ETSI has developed a new System Reference Document (TR 103 409) entitled “Wireless Power Transmission (WPT) systems for EV operating in the frequency band 79-90 kHz”. Furthermore, ETSI is developing a new harmonised standard (EN 303 417) for Wireless power transmission using technologies other than radio frequency beam in 19-21 kHz; 59-61 kHz; 79-90 kHz; 100-300 kHz; 6 765-6 795 kHz.

A number of proposals have been submitted to the recent meeting of ITU-R WP1A in November 2016 referring to the possible frequency bands to be used by WPT. WP1A sent a communication to WP1B, indicating that the information contained in the various contributions to WP1A shows that candidate frequency bands or individual frequencies for WPT are:

19-21 kHz;

59-61 kHz;

79-90 kHz;

100-300 kHz.

In the light of this information, WP1B intends to focus its studies to these frequency ranges for both purposes mentioned above.

WP1B will consider also the 6 765-6 795 kHz band in its studies, which is already included in the draft new recommendation ITU-R SM.[WPT].CEPT has identified the following issues which require clarification:

Definition of electric vehicle,

WPT Mechanisms,

Regulatory basis for WPT,

Power level categories and aggregation.

# List of relevant documents

* Report ITU-R SM.2303-1, Wireless power transmission using technologies other than radio frequency beam
* ETSI TR 103 409, System Reference document (SRdoc); Wireless Power Transmission (WPT) systems for Electric Vehicles (EV) operating in the frequency band 79-90 kHz
* Draft New Recommendation ITU-R SM.[WPT] Frequency ranges for global or regional operation and Human Hazards of non-beam Wireless Power Transmission (WPT) systems (this recommendation focuses on charging of mobile/portable devices)
* Working Document towards a preliminary draft new Report ITU-R SM.[WPT.SPEC.MNGM]; [Methodology for spectrum management of wireless power transmission (WPT) developed by WP1B.

# Actions to be taken

Consider the result of studies to be conducted by SE24 in the context of issue 9.1.6.

Contribution on the issues identified for clarification should be submitted to ITU-R WP 1B.

# Relevant information from outside CEPT (examples of these are below)

## European Union (date of proposal)

## Regional telecommunication organisations

APT (date of proposal)

ATU (date of proposal)

Arab Group (date of proposal)

CITEL (date of proposal)

RCC (16 September 2016)

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.

## International organisations

IATA (date of proposal)

ICAO (date of proposal)

IMO (date of proposal)

IARU (25 November 2016)

IARU observes that the High Power Wireless Power Transfer (HPWPT) is an emerging technology which will in time become deployed on a widespread basis (one in every house). IARU further observes the on-going work in ITU and standards organisations to propose frequency ranges for HPWPT. IARU is of the view that radio frequency emissions resulting from any kind of Wireless Power Transmission (WPT) must be confined to the frequency ranges already identified for equipment used for industrial, scientific, and medical (ISM) applications or if found necessary, to frequencies below 100 kHz.

Since HPWPT involves very large amounts of RF power and an HPWPT installation involve 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 cause interference to other radiocommunication systems or services in accordance with RR 15.12 and RR 15.13.

Sources of emissions on frequencies other than the fundamental frequency of the HPWPT include:

* High order harmonics of the fundamental WPT frequency;
* Phase noise from the frequency control circuits (“jitter”) causing wideband noise;
* Spurious signals form the switch-mode power supply on all control and power ports – conducted and common mode;
* Common mode signals on control cables and power lines from data communication networks associated with the control of the unit.
* To ensure adequate protection to authorised radio services, proper compatibility and sharing studies should be conducted.

IARU strongly supports cooperation between ITU and Standards organisations in the evolution of standards and frequencies for HPWPT operation.

SFCG (June 2016)

While past work on the topic of WPT for electric vehicles has focused on bands below 400 kHz, and in the 6 765-6 795 kHz band, Resolution 958 (WRC-15) does not limit the studies to those bands. SFCG should continue to monitor the developments of this agenda item for any spectrum requirements identified that could impact space science services operations.

WMO and EUMETNET (21 November 2016)

EUMETNET does not oppose to study suitable harmonized frequency ranges for WPT provided that it does not impact operation of lightning detection networks operating in the 20-300 kHz range.

## Regional organisations

ESA (28 November 2016)

ESA supports the SFCG position.

Eurocontrol (date of proposal)

## OTHER INTERNATIONAL AND REGIONAL ORGANISATIONS

EBU (date of proposal)

GSMA (date of proposal)

CRAF (date of proposal)