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| CPG19-3 |
| Vienna, Austria, 14th - 17th March 2017 |
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| Subject:  | Draft CEPT Brief on WRC-19 Agenda Item 9.1 Issue 9.1.8 |
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| Summary:  |
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| Proposal: |
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1. The following pages are intended to be compiled in one CEPT Brief on AI 9

DRAFT CEPT BRIEF ON ITEM 9.1 – ISSUE 9.1.8 – Issue 3) in the Annex to Resolution 958 (WRC-15)

# ISSUE

Resolution 958 (WRC-15) invites ITU-R to study technical and operational aspects of radio networks and systems, as well as spectrum needed, including possible harmonized use of spectrum to support the implementation of narrowband and broadband machine-type communication infrastructures, in order to develop Recommendations, Reports and/or Handbooks, as appropriate, and to take appropriate actions within the ITU Radiocommunication Sector (ITU-R) scope of work.

# Preliminary CEPT position

CEPT supports studies on the technical and operational aspects of radio networks and systems, as well as spectrum needed, including possible harmonized use of spectrum to support the implementation of narrowband and broadband machine-type communication infrastructures, in order to develop Recommendations, Reports and/or Handbooks, as appropriate.

CEPT supports the consideration of IMT technologies within Agenda item 9.1 issue 9.1.8 as well as the consideration of non-IMT technologies in the purview of WPs 1B and 5A related to machine-type communications.

# Background

The significant increase of the number of connected and networking devices and machines is anticipated in the near future and already happening today. This type of connectivity is referred to as machine-type communications or in a more general understanding as Internet of Things (IoT). The majority of such devices and machines are using wireless technologies for communication corresponding to different radiocommunication services and applications. Among others IMT technology and short range devices are expected to be used extensively for machine-type communications.

The standardization and harmonization aspects of machine-type communications have been raised firstly within ITU-T, where Study Group 20 “IoT and its applications including smart cities and communities” has been created to address the standardization of end-to-end architectures for IoT, and mechanisms for the interoperability of IoT applications and datasets employed by various vertically-oriented industry sectors. To complement ITU-T activities within ITU-R, Radiocommunication Assembly 2015 adopted Resolution ITU-R 66 “Studies related to wireless systems and applications for the development of the Internet of Things” to foster studies on spectrum aspects of machine-type communications. Nevertheless, a number of administrations at WRC-15 proposed to have dedicated AI to focus standardization and harmonization on radio technologies for IoT, specifically to simplify equipment complexity and achieve the benefits of economies of scale. After discussion it was decided to conduct studies in this regard within AI 9.1 as Issue 9.1.8 (AI 9.1.8) and to consider the need for any appropriate action based on the results of such studies.

Within ITU-R, Working Party 5D is the responsible group for the preparation of CPM Text for AI 9.1.8 and Working Parties 1B and 5A are concerned groups. WP 5D has started the consideration of AI 9.1.8. The work on machine-type communication infrastructures under AI 9.1.8 coincides with the studies proposed to be conducted within WP 5D on the use of terrestrial IMT by other industry sectors. At the meeting of WP 5D in June 2016 it was decided to focus the work on the new Report ITU-R M.[IMT.BY.INDUSTRIES] and consider on a later stage, which elements from this study could be used for AI 9.1.8. Currently only general information has been incorporated to the working document towards draft CPM text for WRC-19 Issue 9.1.8.

During the 25th meeting of WP 5D in October 2016 the contribution from six Arab countries has proposed to harmonize 733-736/788-791 MHz bands for machine type communication. This proposal hasn’t been endorsed by the meeting, but new studies have been initiated to address technical and operational aspects of IMT radio networks, as well as the spectrum needs, and possible harmonized use of spectrum on Narrowband and Broadband IMT machine type communications. At the 25th meeting WP 5D agreed to consider non-IMT technologies in the purview of WPs 1B and 5A related to machine-type communications based on contributions from CEPT and United States. As a result the liaison statement to WPs 1B and 5A has been prepared to invite them to contribute material for draft CPM text for WRC-19 issue 9.1.8. WPs 1B and 5A have sent initial replies already, but without any specific proposals so far.

The topic of IMT and non-IMT technologies for machine-type communications has been thoroughly discussed during ITU-R workshop on “Spectrum management for Internet of Things deployment” in conjunction with the ITU-R Study Groups 1 and 5 meetings at the 22nd November 2016. Based on the discussion during the workshop it could be noted that the variety of IoT applications could be already addressed by short range devices (SRD) and IMT networks, however critical applications in machine type communications may require further consideration beyond general framework of SRD and IMT. One example of such applications is transport sector. In this regard Issue 9.1.8 may be interrelated with the studies under AIs 1.11 and 1.12.for railroad communications and ITS accordingly. In addition, it should be mentioned that during the workshop ASMG representative has presented aforementioned proposal to harmonize 733-736/788-791 MHz bands for machine type communication and ATU representative has also mentioned the consideration of such proposal.

In CEPT the work on machine-type communications is conducted as part of the regular tasks, mostly in relation to MFCN and short range devices. These tasks have no direct relation to ITU-R activities. As an example ECC PT1 is developing new ECC report on the suitability of the current ECC framework for MFCN in the frequency bands 700 MHz, 800 MHz, 900 MHz, 1400 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2600 MHz, 3400-3600 MHz and 3600-3800 MHz for the future usage of LTE-based M2M and Narrowband M2M. Some of the results of such studies might be used for AI 9.1.8, if required. Another example is CEPT Workshop on Machine-to-Machine Communications (M2M) held on 21-22 March 2016 in Mainz, Germany, which gave an opportunity to collect information on different aspects of M2M development. Some elements relevant to machine type communications have been also discussed during CEPT Workshop on 5G Mobile Communications on 2-4 November 2016 in Mainz, Germany, where among other matters specific needs for vertical industries were presented.

# List of relevant documents

ITU Documentation (Recommendations, Reports, other)

* Doc. [5D/374, Attachment 3.12](https://www.itu.int/md/dologin_md.asp?lang=en&id=R15-WP5D-C-0374!H03!MSW-E) Working document towards draft CPM text for WRC-19 issue 9.1.8.
* Doc. [5D/374, Attachment 3.14](https://www.itu.int/md/dologin_md.asp?lang=en&id=R15-WP5D-C-0374!H03!MSW-E) Working document towards a preliminary draft new Report M.[IMT.BY.INDUSTRIES] “The use of terrestrial component of International Mobile Telecommunication (IMT) by industry sectors”.
* Recommendation ITU-R M.2083-0 IMT Vision – Framework and overall objectives of the future development of IMT for 2020 and beyond.

CEPT and/or ECC Documentation (Decisions, Recommendations, Reports)

EU Documentation (Directives, Decisions, Recommendations, other), if applicable

# Actions to be taken

To develop a CEPT contribution to WP 5D to highlight the harmonization of the 733-736/788-791 MHz bands for PPDR within CEPT in accordance with ECC/DEC/(16)02. Although there is a possibility for an optional use of the 733-736/788-791 MHz bands for M2M on a national basis as outlined in ECC/DEC/(15)01, there is no CEPT harmonised framework for M2M in these bands. CEPT is investigating the suitability of the current harmonised CEPT framework for mobile broadband, in particular the 900 MHz, 1800 MHz, for the future usage of LTE-based M2M and Narrowband M2M.

To consider issues arising from the requirements of vertical industries in particular the transport sector and their relevance for Issue 9.1.8, taking into account ongoing studies under AIs 1.11 and 1.12.

# 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 (December 2016)

Preliminary Views

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| Brazil | The Brazilian Administration has analyzed the current and future spectrum use for MTC and Internet of Things (IoT), which showed that there is no need to identify specific spectrum for those applications. The identification of spectrum for mobile communications (voice and data), guarantees quality of service (QoS). Different aspects can be faced with the use of unlicensed spectrum for metropolitan areas. Unlicensed spectrum is better suited for small areas with some control of interference (i.e. homes, offices, etc.). The devices connected through unlicensed spectrum using technologies such as WiFi, Bluetooth, Zigbee, etc. can be connected to a metropolitan area through a HUB which aggregates the traffic and sends it via mobile networks with guaranteed QoS.IoT applications and devices can be used effectively with all the benefits of the existent mobile broadband bands and the new frequency bands being studied for IMT. This approach avoids the necessity of identifying new spectrum dedicated exclusively for IoT applications. |

RCC (16 September 2016)

The RCC Administrations support the development of ITU-R Recommendations, Reports and/or Handbooks on technical and operational aspects of different radio networks and systems, as well as on spectrum needed and experience in spectrum use, to support the implementation of narrowband and broadband machine-type communication infrastructures.

## International organisations

IATA (date of proposal)

ICAO (date of proposal)

IMO (date of proposal)

SFCG (SFCG-36, 7-15 June 2016, Mainz, Germany)

SFCG should continue to monitor the developments of this agenda item in WP 5D for any spectrum requirements identified that could impact space science services operations. Although no specific frequency ranges are identified to exclusively provide for the enhanced services, these services may be considered to be within the definition of IMT-2020 and, as such, add to the total amount of spectrum to be sought under AI 1.13.

WMO and EUMETNET (date of proposal)

## Regional organisations

ESA (date of proposal)

Eurocontrol (date of proposal)

## OTHER INTERNATIONAL AND REGIONAL ORGANISATIONS

EBU (date of proposal)

GSMA (date of proposal)

CRAF (date of proposal)