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| Cluj Napoca, Romania, 4th - 7th July 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. The work has progressed during the 26th meeting of WP 5D and a new working document towards a preliminary draft new Report ITU-R M.[IMT.MTC/NB.BB.IOT/SPECTRUM] has been commenced. CEPT has prepared a contribution to WP 5D in order to inform WP 5D about current CEPT regulatory framework to harmonise aforementioned bands for PPDR.

WP 5D has also agreed to consider non-IMT technologies in the purview of WPs 1B and 5A related to machine-type communications and invited WPs 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. These AIs are considered in relation to possible harmonisation of frequency bands for ITS or railroad communications at global and regional levels within existing mobile service allocations. Furthermore, Report ITU-R M.[IMT.BY.INDUSTRIES] within WP 5D related to AI 9.1 Issue 9.1.8 includes ITS applications via LTE-based V2X feature as ad-hock communication. This belongs to Agenda item 1.12 only. The part of the operation scenario via an operator network is in the scope of Issue 9.1.8. CEPT may consider other application based narrowband and broadband machine-type communication, which are not covered by AIs 1.11 and 1.12 and which may be reasonable to harmonize at global and regional levels within existing services allocations.

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 has developed an ECC report on the suitability of the current ECC framework for MFCN in the frequency bands 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, and 2600 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”.
* 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 a preliminary draft new Report ITU-R M.[IMT.MTC/NB.BB.IOT/SPECTRUM]
* 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)

* ECC Report 266 – The suitability of the current ECC regulatory framework for the usage of Wideband and Narrowband M2M in the frequency bands 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2.1 GHz and 2.6 GHz

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

# Actions to be taken

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. To investigate any additional specific applications and/or bands, which are not covered within AI 1.11 and 1.12, and which may be reasonable to harmonize at global and regional levels within existing services allocations in order to implement narrowband and broadband machine-type communication infrastructures, through the development of an ITU-R Recommendation or an ITU-R Report.

# 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 (The 22nd meeting of ASMG, 15-20 April 2017)

Initial position: Support the use of regionally or globally harmonized frequency bands in the frequency bands identified for IMT systems for Internet of Things (IoT) applications and systems.

The new contribution has been received within ASMG to update the position and is on under consideration:

- Narrowband IoT and MTC: Support the harmonised use of the A9 arrangement In ITU-R Recommendation M.1036 (2x3 MHz, 733-736 / 788-791 MHz) which is identified for IMT in the 700 MHz band for narrow band IoT and MTC, with the possibility of using this arrangement (2x3) in the 700 MHz band for other applications within IMT systems, and the possibility of using other frequency bands identified for IMT systems for IoT and MTC applications and systems based on availability of frequency bands in different states.

- Broadband IoT and MTC: Support the use of existing bands identified for IMT systems to support the implementation of broadband communications infrastructure for IoT and MTC.

- Support follow-up studies to nominate other bands identified to IMT systems for narrowband and broadband IoT and MTC systems and application.

CITEL (December 2016)

Preliminary Views

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| Brazil, Canada | These administrations have analyzed the current and future spectrum use for MTC and IoT, also, are taking in to account the importance to know the development and eventual findings of the studies related to issue 9.1.8 of Agenda Item 9.1 of the WRC-19.Accordingly, MTC and 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 stablish dedicated spectrum exclusively for MTC and IoT applications on identified IMT bands. |

Inter-American Proposal

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| Brazil, Colombia, Dominican Republic, Mexico, United States, Guatemala, Panama, Uruguay | NOC DIAP/9.1 Issue 9.1.8/1 Radio Regulations Volumes 1, 2 and 4Reasons: Analysis of the current and future spectrum use for narrowband and broadband machine type communications (MTC), also known as machine-to-machine (M2M) or Internet of Things (IoT), concluded that there is no need to identify specific spectrum for those applications. Therefore, no change to the Radio Regulations or regulatory action is required.. |

RCC ( 14 April 2017)

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.

The RCC Administrations understood that the practicability for harmonization of any frequency bands for narrowband or broadband machine-type communication shall be justified taking into account features and prospects of the introduction of such systems both within IMT and non-IMT technologies.

## International organisations

IARU (April 2017)

The IARU supports the use of spectrum efficient technologies for MTC. Because MTC devices typically will be co-located with stations in the amateur service, the use of spectrum allocated to the amateur service would be problematic for both uses.

IATA (date of proposal)

ICAO (date of proposal)

IMO (date of proposal)

NATO (23 June 2017)

This NATO military assessment summary is a common military assessment of the NATO Nations on the potential impacts and benefits of Agenda Item 9.1, Issue 9.1.8. It does not constitute a common position of the NATO Nations.

Given that this technology is fairly new, from a military perspective, any regulatory changes may cause undue risk to military systems, specifically those operating in NJFA bands and would be premature.

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)