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| Summary:  |
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| Proposal: |
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DRAFT CEPT BRIEF ON AGENDA ITEM 1.11

1.11 to take necessary actions, as appropriate, to facilitate global or regional harmonised frequency bands to support railway radiocommunication systems between train and trackside within existing mobile service allocations, in accordance with Resolution 236 (WRC‑15);

# ISSUE

Resolution 236 (WRC-15) “Railway radiocommunication systems between train and trackside (RSTT)” resolves to invite the 2019 World Radiocommunication Conference based on the results of ITU-R studies, to take necessary actions, as appropriate, to facilitate global or regional harmonised frequency bands, to the extent possible, for the implementation of railway radiocommunication systems between train and trackside, within existing mobile-service allocations and invites ITU-R:

* to study the spectrum needs, technical and operational characteristics and implementation of railway radiocommunication systems between train and trackside

# Preliminary CEPT position

CEPT is of the view that the harmonized use of frequencies for RSTT within existing mobile service allocations serves current and future demands of railway organisations on all operational levels.

CEPT is of the view that no changes to the RR are needed in response to WRC-19 Agenda item 1.11.

CEPT is of the view that harmonisation for RSTT can be achieved by the development of an appropriate non-mandatory ITU-R Recommendation containing its regional harmonisation measure. In this regard, CEPT highlights its existing framework for train radio RSTT on the basis of GSM-R, which serves interoperable cross-border railway operations. CEPT recognizes that there are other standards/technologies and frequency bands providing for RSTT.

In addition, CEPT is of the view that Agenda item 1.11 does not cover the provision of public communication services for passengers.

# Background

WRC-15 decided to invite ITU-R to undertake and complete the relevant studies allowing wireless technologies to be more widely implemented in railway transport infrastructure. WRC-15 adopted Resolution 236 (WRC-15), which invites ITU-R to study the spectrum needs, technical and operational characteristic for railway radiocommunication systems between train and trackside (RSTT). Those radiocommunication systems (and related applications) between train and trackside provide improved railway traffic control, passenger safety and improved security for train operations. Furthermore, international standards and harmonized spectrum would facilitate global or regional deployment of railway radiocommunication systems between trains and trackside, within existing mobile-service allocations.

## Description of RSTT systems and applications

RSTT, although in use for about a centennial world-wide, is a new concept for the ITU. Therefore the responsible ITU-R WP5A decided to develop an ITU-R Report introducing RSTT systems and applications and explaining railway operations on all levels. This will include information on systems and applications for train radio, train positioning, train remote and train surveillance. The Report, currently, is an early draft in WP5A, considers the combination of those four systems/applications as RSTT in its entirety. The various operational aspects of these provide for the improved railway traffic control, passenger safety and improved security for train operations. For these operations critical and performance railway communication applications[[1]](#footnote-1) are needed, while business communication applications including passenger data requirements are not covered by this Agenda item.

## CONSIDERATION ON REGULATORY FRAMEWORKS IN Europe

CEPT harmonised the paired frequency bands 876-880/921-925 MHz via ECC Decision (02)05, which identifies those bands for the use by railways operations. CEPT in addition considered the bands 873-876/918-921 MHz for a possible extension for GSM-R operations on national level (see ECC Decision (04)06 on PMR/PAMR). Furthermore, the European Commission defines interoperability for pan-European of railway operations in the EU Directive 2016/797/EU and the associated EC Decision 2016/919/EC regulating the technical specifications relating to the control-command and signalling sub-systems of rail system in the European Union. This includes the various RSTT systems and applications on all operational levels.

Furthermore, CEPT is currently undertaking work (in PT FM56) on spectrum issues related to railway applications, especially GSM-R and its successor. This work includes an assessment of spectrum needs and an identification of suitable candidate bands for European-wide harmonisation for RSTT.

## technical and operational characteristics

Depending on the related task of the various RSTT systems and applications, the technical and operational characteristics vary.

Train radio

Part of a railway signalling system used for communication between train and track side for traffic management with the aim to contribute to safe train operation.

Train positioning

Systems which gather all kind of train positioning information (exact location of all units on trackside) relevant to train operation. This includes line- and location-oriented information.

Train remote

All kind of systems to control units remotely on trackside or at specific locations (e.g. shunting yards, maintenance depots).

Train surveillance

CCTV systems enable the capture of footage of the public and trackside areas, driver cabs, passenger compartments and platforms to improve safety.

### Current spectrum needs and implementation

1. It is noted that FM56 is dealing with spectrum issues for train radio RSTT.

Following the different technical and operational characteristics of the different systems and applications also the spectrum needs vary. This is also relevant for the implementation of each system/application as follows:

Train radio

Provides mobile-to-landline and mobile-to-mobile voice communication and also serves as the data transmission channel within various bearer services.

For voice communication train radio provides call functions (point to point / group / emergency / conference) with specialized modes of operation (e.g. location depending addressing, call priorities, late-entry, and pre-emption).

In order to satisfy the spectrum needs for train radio RSTT in Europe, some administrations are of the view that a maximum of 2x7 MHz is required, and the frequency band 873-880 / 918-925 MHz is the preferred candidate for this purpose.

Train positioning

* Balises that serve as "beacons" giving the exact location of a train as well as transmitting signalling information in a digital telegram to the train.
* Axle Counters that control the integrity of trains in all operations by counting the number of axles at a given position.
* Loops/Leaky cable that transmit signalling information.
* Annunciators that control level crossings when a train route has been set and the indication point is passed by an approaching train.
* Radar sensors that control e.g. level crossings when train is approaching.

Train remote

Analogue technology that provides a point-to-point data communication to handle various tasks of shunting staff. It provides functionality to control trains in a pitch and catch operation.

In addition to satisfy the spectrum needs for train remote RSTT in Europe, some administrations are of the view that a maximum of 2x7 MHz may be required, and the frequency band 873-880 / 918-925 MHz is the preferred candidate for this purpose.

Train surveillance

Contributes to:

* analyse the railway environment,
* improve maintenance services, and
* gather information on infrastructure.

A set of cameras at specific locations (front, interior, rear view and outdoor) is used in low to high resolution, low and high frame-rates depending on special events. Data may be either stored on-board/locally or streamed (e.g. realtime video) to control centres via dedicated radio links.

# List of relevant documents

ITU-Documentation (Recommendations, Reports, other)

* draft new Report ITU-R M.[RAIL.LINK] Introduction to specific railway communication systems in the millimetric wave frequency range (Doc.SG05/29);
* Document 5A/469 – Chairman’s Report WP5A (May 2017)

Annex 06 - Working document towards preliminary draft CPM text for WRC-19 Agenda item 1.11;

Annex 07- Work plan for preparation for WRC-19 agenda item 1.11;

Annex 16 - Preliminary draft new Report ITU-R M.[RSTT.Description] - Description of Railway Radiocommunication Systems between Train and Trackside (RSTT);

Annex 17- Working document toward a preliminary draft new Report ITU-R M. [RSTT.USAGE] - Current and future usage of railway radiocommunication systems between train and trackside (RSTT);

Annex 18- Working document towards a preliminary draft new Recommendation ITU-R M.[RSTT] - Harmonization of frequencies and related frequency arrangements, for railway radiocommunication systems between train and trackside;

Annex 30- Working document towards a preliminary draft new Report ITU-R M.[90-GHz.RSTT.COEXIST] - Coexistence between railway radiocommunication system between train and trackside operating in the frequency bands 92-94 GHz, 94.1-100 GHz and 102 109.5 GHz, and active and passive services.

1. This needs to be reviewed by PTD-5
* Output of the work by correspondence conducted by WP5A on RSTT applications

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

* ECC Decision (02)05: Frequency bands for railway purposes 876-880 / 921-925 MHz.
* ECC Decision (04)06: Wide Band Digital PMR/PAMR in the 400 MHz and 800/900 MHz.
* [ECC Report 096](http://www.erodocdb.dk/Docs/doc98/official/Word/ECCREP096.DOC): Compatibility between UMTS 900/1800 and systems operating in adjacent bands.
* [ECC Report 146:](http://www.erodocdb.dk/Docs/doc98/official/Word/ECCREP146.DOC) Compatibility between GSM MCBTS and other services (TRR, RSBN/PRMG, HC-SDMA, GSM-R, DME, MIDS, DECT) operating in the 900 and 1800 MHz frequency bands.
* [ECC Report 162](http://www.erodocdb.dk/Docs/doc98/official/Word/ECCREP162.DOC): Practical mechanism to improve the compatibility between GSM-R and public mobile networks an guidance on practical coordination
* [ECC Report 229](http://www.erodocdb.dk/Docs/doc98/official/Word/ECCREP229.DOCX): Guidance for improving coexistence between GSM-R and MFCN in the 900 MHz band.

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

* 2008/57/EC on the interoperability of the rail system in the community;
* 2016/919/EC - Commission Regulation on technical specifications for interoperability relating to the control-command and signalling sub-systems of rail system in the European Union.

Other Documentation, if applicable

* International Union of Railways, Future Railway Mobile Communication System, User Requirements Specification (URS), 29 March 2016.

# Actions to be taken

CEPT administrations are encouraged:

to study information upon railway radiocommunication systems on current status of frequency usages, technologies, national regulatory experiences of ITU Members and etc.;

to collect relevant technical standards, technical evolving trends and the results of studies from international and regional organisations;

to investigate RSTT systems characteristics (description, architecture, functionality, working scenarios, etc.), and spectrum requirements for railway radiocommunication systems between train and trackside.

# 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 (April 2017)

The ASMG position:

* Follow-up the studies about railway radio systems between the train and trackside within the current allocations of the mobile service.
* Ensuring protection of the existing services without imposing any new restrictions on them.
* Encourage the administrations to study spectrum requirements for these applications in order to reach to harmonized frequency bands.

CITEL (January 2018)

Inter American Proposal supported by:

Argentina, Brazil, Canada, Ecuador, Guatemala, Mexico, United States of America, Uruguay

NOC   DIAP/1.11/1 Radio Regulations Volumes 1 & 2

Reason: The United States and Canada believe it is unnecessary to identify spectrum specifically for railway radiocommunication systems. Regional and global harmonization can be satisfied by developing applicable ITU-R Reports and Recommendations.  Therefore, no change to the Radio Regulations or regulatory action is required under this agenda item.

SUP  DIAP/1.11/2 RESOLUTION 236 (WRC-15)

Railway radiocommunication systems between train and trackside

Reasons:  The studies towards regional and global harmonization can be satisfied through ITU-R Recommendations and Reports.

RCC (January 2018)

The RCC Administrations consider it reasonable to harmonize frequency bands at global or regional level for their use by railway radiocommunication systems between train and trackside within existing mobile service allocations, including through the development of ITU-R Recommendations and Reports.

The RCC Administrations are of the view that harmonized use of frequency bands by railway transportation systems within existing mobile service allocations shall not impose additional constraints on other services to which these frequency bands are already allocated, and shall provide the protection of existing systems for government communication.

## International organisations

IATA (date of proposal)

ICAO (date of proposal)

IMO (date of proposal)

NATO (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 1.11. It does not constitute a common position of the NATO Nations:

There is no identified threat to NATO military capability from this Agenda Item at this stage.

**IARU (June 2017)**

The IARU supports satisfying the spectrum needs for railway radiocommunication systems between train and trackside within existing mobile service allocations that are not also allocated to the amateur service.

SFCG (June 2016)

SFCG supports the protection of existing space science service allocations. Since no specific frequency bands have been proposed for study, SFCG does not have a specific concern on this agenda item at this time.

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 (June 2017)

CRAF supports the protection of existing RAS frequency allocations. Depending on the vicinity of the selected frequency bands to RAS allocations, CRAF requests no changes to the RR unless acceptable sharing and compatibility criteria are developed to ensure the protection of RAS from future railway radiocommunication systems.

1. In accordance with the UIC User Requirement Specification Version 2.0, critical communication applications are applications that are essential for train movements and safety or a legal obligation, such as emergency communications, shunting, presence, trackside maintenance, automatic train control, etc. Performance communication applications are applications that help to improve the performance of the railway operation, such as train departure, telemetry, etc. Business communication applications are applications that support the railway business operation in general, such as wireless internet, etc. [↑](#footnote-ref-1)