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| Summary:  |
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| Proposal: |
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# Draft CEPT BRIEF

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 change to the RR is needed in response to WRC-19 Agenda item 1.11, except suppression of Resolution 236 (WRC-15).

CEPT is of the view that harmonisation of frequencies for RSTT can be achieved through the course of ITU-R study group work by an applicable ITU-R Recommendation and/or Reports (e.g. non-mandatory Recommendation ITU-R M.[RSTT\_FRQ\_HARMONISATION] containing regional harmonisation measures). In this regard, CEPT highlights its existing framework for RSTT train radio 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 Decision ECC/DEC/(02)05, which identifies those bands for the use by railways operations. In addition the bands 873-876/918-921 MHz are considered by CEPT for a possible extension for GSM-R operations on national level (see Decision ECC/DEC/(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 Regulation 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 RSTT train radio.

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

Train radio

It provides mobile-to-landline and mobile-to-mobile voice communication and also serves as the data transmission channel.

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 RSTT train radio CEPT harmonised the paired frequency bands 876-880/921-925 MHz via Decision ECC/DEC/(02)05, which identifies those bands for the use by railway operations. In addition the bands 873-876/918-921 MHz are considered by CEPT for a possible extension for GSM-R operations on national level.

The future target spectrum needs related to the successor of GSM-R are still under investigation in FM56.

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 or digital 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 order to satisfy the spectrum needs for RSTT train radio CEPT harmonised the paired frequency bands 876-880/921-925 MHz via Decision ECC/DEC/(02)05, which identifies those bands for the use by railway operations. In addition the bands 873-876/918-921 MHz are considered by CEPT for a possible extension for GSM-R operations on national level.

For the use by train remote the bands identified for train radio can be used simultaneously.

Train surveillance

It contributes to:

* analysing the railway environment,
* improving maintenance services, and
* gathering information on infrastructure.

A set of cameras at specific locations (front, interior, rear view and outdoor) is used with low and high resolution, as also 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)

* Report ITU-R M.2395-0 - Introduction to specific railway communication systems ;
* Report ITU-R M.2418 - Description of Railway Radiocommunication Systems between Train and Trackside (RSTT);
* Document 5A/844 - Chairman’s Report WP5A (May 2018)

Annex 07 - Report on activities in support of WRC-19 agenda item 1.11;

Annex 14 - Preliminary draft new Report ITU-R M. [RSTT.USAGE] - Current and future usage of Railway Radiocommunication Systems between Train and Trackside (RSTT);

Annex 15 - Working document towards a preliminary draft new Recommendation ITU-R M.[RSTT\_FRQ] - [Harmonization of] frequencies and related frequency arrangements, for Railway Radiocommunication Systems between Train and Trackside;

Annex 27 - Working document towards a preliminary draft new Report ITU-R M.[100-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. These references need to be reviewed by PTD-5 after each WP5A meetings.

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

* Decision ECC/DEC/(02)05: Frequency bands for railway purposes 876-880 / 921-925 MHz.
* Decision ECC/DEC/(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 actively participate to the work within PT FM56 related to the assessment of spectrum needs for railway radiocommunication systems;

to develop a CEPT contribution to November 2018 ITU-R WP5A meeting on the draft new recommendation [RSTT\_FRQ\_HARMONISATION]

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

## European Union (date of proposal)

## Regional telecommunication organisations

APT (Sept 2018)

Preliminary View

APT Members support studies towards global or regional harmonized frequency bands to support RSTT within existing mobile service allocations, in accordance with Resolution 236 (WRC-15), and are of the view that international standards and global/regional harmonized spectrum would facilitate the current and future development of RSTT.

APT Members are also of the view that:

* The implementation of harmonized frequency arrangements of RSTT shall not impose additional constraints on other primary services to which these frequency bands are already allocated.
* ITU-R studies on RSTT should not be restricted to, or preclude, any particular relevant technology.
* Harmonized frequency arrangements of RSTT can support cross-border railway operations.

Issues for consideration of next APG meeting:

* APT Members are encouraged to consider frequency bands which could be harmonized to support railway radiocommunication systems between train and trackside within existing mobile service allocations.
* APT Members are also encouraged to consider the Draft CPM text on this agenda item, taking into account that CPM 19-2 meeting will be held after the APG 19-4.

ATU (September 2018)

The APM19-3 preliminary position:

METHOD C which entails a new WRC Resolution to provide a regulatory framework to guide the harmonisation process, with reference to the Recommendation ITU R M.[RSTT\_FRQ] for possible global and/or regional harmonization of frequency arrangements for RSTT to provide flexibility. This method provides support for global or regional harmonization of frequency bands for use by (RSTT) within the existing mobile service allocation so that no additional constraints are imposed on services to which these frequency bands are already allocated.

Arab Group (April 2018)

* 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.
* Conduct a questionnaire for Arab administrations about railway radiocommunicationsystems.

CITEL (June 2018)

Harmonization of spectrum to be addressed via ITU Reports and Recommendations

RCC (March 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 2018)

NATO Military Assessment

There is no identified threat to NATO military capability from this agenda item as long as there is no change to the ITU Radio Regulations.

NATO Position

NATO supports no change to the ITU Radio Regulations

**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)