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INTERNAL DOCUMENT

RADIO SPECTRUM COMMITTEE

Working Document

Subject: Draft Mandate to CEPT on spectrum for the future railway mobile communications system.

**Opinion of the RSC
pursuant to Advisory Procedure under Article 4 of Regulation 182/2011/EU and
Article 4.2 of Radio Spectrum Decision 676/2002/EC**

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1. PURPOSE

The objective of this Mandate is to consider the required amount of spectrum, identify appropriate spectrum bands, study technical feasibility and develop harmonised technical conditions for a sustainable and efficient use of such bands for the operation of the future railway mobile communications system (FRMCS), which is the successor of GSM-R.

This mandate specifically invites CEPT to study the following frequency bands for existing and future mission-critical¹ railway mobile communications

- 874.4-880 MHz and 919.4-925 MHz
- 1 900-1 920 MHz

Further spectrum bands, for example the band 2 290-2 400 MHz on a tuning range basis, and use of commercial mobile networks may also be studied. In this regard, the progressive phase-out of the existing GSM-R technology and the need for coexistence and simultaneous operation of the existing and the forthcoming system for up to several years should be considered, also in terms of spectrum needs.

2. EU POLICY CONTEXT

Railways are essential for the EU economy. The European railway network covers over 220 000 km of lines and carries 9 billion passengers and 1 700 million tonnes of freight per year². The frequency bands to be studied and commercial networks should be considered as a possibility to support railway digitalisation and innovation.

The radiocommunication system used for railway operation is currently GSM-R. Today over 100 000 km of railway lines are operated by GSM-R³ and this amount is still growing. It is defined through the basic parameters included in section 4 of the CCS TSI⁴. The air interface is specified to use the R-GSM⁵ band (see table 3-A in 3.5.1 of the EIRENE SRS). The so-called "UIC band" reserved for GSM-R operation is 876-880/921-925 MHz. These bands are harmonised EU-wide by Commission Decision 1999/569/EC of 28 July 1999⁶, which in its Article 2 provides that "*The*

¹ Mission Critical: applications that are essential for train movements and safety or a legal obligation, such as emergency communications, shunting, presence, trackside maintenance and Automatic Train Control (as described in UIC FRMCS User Requirement Specification v3.0.0. Art 4.1.3). <https://uic.org/IMG/pdf/fu-7100-3.0.0.pdf>

² Source: "*The economic footprint of railway transport in Europe*", CER 2014.

³ Source: UIC.

⁴ Control Command and Signalling Technical Specifications for Interoperability. <http://www.era.europa.eu/Core-Activities/ERTMS/Pages/Current-Legal-Reference.aspx>

⁵ GSM-R refers to the radio elements of ERTMS (network and equipment) while R GSM is a designation for the frequency band 876-915 & 921-960 MHz. This includes the public mobile GSM network.

⁶ <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:01999D0569-19990729&qid=1519396120758&from=EN>

frequency bands used for GSM-R radio links shall be 876-880 MHz for the train-to-ground link and 921/925 MHz for the ground-to-train link". These bands are used on a shared basis with others usages at national level (e.g. Defence) to ensure an efficient usage of the spectrum while ensuring an effective coexistence of these different usages.

As telecommunication standards are evolving and new railway applications are needed, GSM technology will become obsolete at some stage. The manufacturing industry is unlikely to support the GSM technology after 2030 and given the long time needed for selecting a technology and making it ready for operation, work has started at various levels (UIC, ERA, CEPT, ETSI...) on the definition of the most suitable radio technology and frequency bands for railway communications of the next generation. CEPT is preparing two ECC reports, respectively on spectrum requirements and on candidate bands for the implementation of the successor to GSM-R.

In its Opinion on ITS published in February 2017⁷, the RSPG highlighted that it will be important to ensure interoperability for FRMCS across Member States. A common approach to make spectrum available for the future railway mobile communications system across the EU would ease implementation.

Recent discussions in the Radio Spectrum Committee and CEPT have shown that the 874.4-880 MHz and 919.4-925 MHz bands as well as the 1 900-1 920 MHz band are the currently most prominent options under investigation for mission-critical operation purposes for the future rail mobile communication system. However, other frequency bands, for example 2 290-2 400 MHz on a tuning range basis are also still under investigation within CEPT as an alternative to the 1 900-1 920 MHz frequency band.

Concerning the 900 MHz range, CEPT is still investigating the total spectrum requirement needed after the GSM R switch off to handle all existing and new railway critical applications. Depending on the result of this CEPT investigation, the remaining spectrum could be considered for other applications such as SRD including RFID.

Within CEPT, the 1 900-1 920 MHz is also identified as a possible band to respond to future needs for professional drones/UAS. ETSI has proposed DECT evolution in 1 900-1 920 MHz⁸. Above 1 920 MHz, the spectrum band is widely and heavily used by WBB ECS.

⁷ https://circabc.europa.eu/sd/a/b30590d7-5190-480b-b1d1-def24719e061/RSPG17-008-Final_opinion_ITS.pdf

⁸ TR103 149 (2013).

3. JUSTIFICATION

Pursuant to Article 4(2) of the Radio Spectrum Decision⁹, the Commission may issue mandates to the CEPT for the development of technical implementing measures with a view to ensuring harmonised conditions for the availability and efficient use of radio spectrum necessary for the functioning of the internal market. Such mandates shall set the tasks to be performed and their timetable.

The Radio Spectrum Policy Programme¹⁰ (RSPP) requires that Member States, in cooperation with the Commission, ensure spectrum availability *"improving transport systems (...) and for intelligent transport safety and transport management systems"*¹¹.

Noting the work of CEPT, ERA, UIC, the evolving work of ETSI and the wider cooperation among stakeholders, the EU regulatory framework on the harmonised use of radio spectrum for railways should be updated in order to take into account the spectrum needs for the future railway mobile communications system taking into account the required migration phase.

4. TASK ORDER AND SCHEDULE

In order to support a common approach to spectrum for the future railway mobile communications system across the EU, CEPT is mandated to carry out the following technical tasks:

- Task 1** Assess the spectrum needs for mission critical operation of the future railway mobile radio communications system (successor system of GSM-R) in terms of required amount of spectrum and frequency ranges. Study solutions for the typical/average need and increased need at limited geographical areas (hotspots) separately.
- Task 2** Based on results of task 1, assess the technical feasibility for operating the successor system in the 874.4-880 MHz / 919.4-925 MHz frequency band while ensuring simultaneous operation of GSM-R and the successor system in these bands during a migration period. In this regard, take into account the spectrum needs, requirements and reliability needs of the railway system and ensure coexistence with services in adjacent bands (ECS below 915 MHz and above 925 MHz, SRD and Defence)¹².
- Task 3** Based on results of task 1, assess the technical feasibility for operating the successor system (FRMCS) in part of the 1 900-1 920 MHz frequency band

⁹ Decision 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community, OJ L108 of 24.4.2002.

¹⁰ Decision 243/2012/EU of 14 March 2012, OJ L81 of 21.3.2012.

¹¹ Article 8 (1) of the RSPP.

¹² Cfr. RSCOM17-50 and RSCOM17-60

in addition to the band mentioned in task 2 while taking into account the specific requirements of the railway system and ensuring coexistence with adjacent use. In this regard, study the impact of shared use between the railway system and other systems under study within this band, with the objective of safeguarding the railway system. In addition, and if necessary, assess the technical feasibility for operating the successor system (FRMCS) in another frequency band.

Task 4 Study and assess the technical feasibility and scenarios of using commercial mobile networks, taking into account wireless coverage and reliability needs of the railway system.

Task 5 Assess the best option for long term development of FRMCS and develop EU-harmonised technical conditions, possibly for shared spectrum use, for the future railway mobile radio communications system, which are suitable for both the migration period and after the GSM-R switch-off, taking into account the results of tasks 1, 2, 3 and 4.

In performing the tasks above, CEPT should take due consideration of the anticipated simultaneous operation between GSM-R and the future railway mobile communications system for several years, which may necessitate a solution for temporary supplementary spectrum allocation for the migration period. During the migration period, pan-European railway interoperability rules are assumed to continue relying on GSM-R carriers within 876-880 / 921-925 MHz frequency bands.

CEPT should work in cooperation with ETSI, as appropriate. CEPT should also ensure close cooperation with all concerned stakeholders when assessing scenarios and developing technical conditions for the shared use of spectrum. It is assumed that receiver characteristics of the future railway mobile communications system (for user terminals and possibly base stations) should fulfil the specific railway availability requirements and ensure appropriate co-existence with services in adjacent bands.

In the work carried out under the Mandate, the overall policy objectives of the Radio Spectrum Policy Programme (RSPP) such as effective and efficient spectrum use and the support for specific Union policies shall be given utmost consideration. When carrying out studies based on this Mandate, the CEPT shall, whenever relevant, take utmost account of the applicable EU law and support the principles of service and technological neutrality, non-discrimination and proportionality insofar as technically possible.

CEPT should provide deliverables under this Mandate according to the following schedule:

Delivery date	Deliverable	Subject
March 2020	Final draft CEPT Report A to the Commission	Draft results under tasks 1, 2, 3 and 4
July 2020	Final CEPT Report A to the Commission taking into account the outcome of the public consultation	Final results under tasks 1, 2, 3 and 4
July 2020	Final draft CEPT Report B to the	Draft results under task 5

	Commission	
November 2020	Final CEPT Report B to the Commission taking into account the outcome of the public consultation	Final results under task 5

CEPT is requested to report on the progress of its work pursuant to this Mandate to all meetings of the Radio Spectrum Committee taking place during the course of the Mandate.

The Commission, with the assistance of the Radio Spectrum Committee and pursuant to the Radio Spectrum Decision, may consider applying the results of this mandate in the Union, pursuant to Article 4 of the Radio Spectrum Decision and having taken into account any relevant guidance of the RSPG.