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COMMISSION IMPLEMENTING REGULATION (EU) .../...

of XXX

**on the technical specification for interoperability relating to the control-command and
signalling subsystems of the rail system in the European Union and
repealing Regulation (EU) 2016/919**

(Text with EEA relevance)

COMMISSION IMPLEMENTING REGULATION (EU) .../...

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on the technical specification for interoperability relating to the control-command and signalling subsystems of the rail system in the European Union and repealing Regulation (EU) 2016/919

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive (EU) 2016/797 of the European Parliament and of the Council of 11 May 2016 on the interoperability of the rail system within the European Union¹, and in particular Article 5(11) thereof,

Whereas:

- (1) Commission Regulation (EU) 2016/919² lays down the technical specification for interoperability (TSI) relating to the ‘control-command and signalling’ (CCS) subsystems.
- (2) Pursuant to Article 3(5), points (b) and (f) of Commission Delegated Decision (EU) 2017/1474³, TSIs are to be reviewed in order to take into account the developments of the Union railway system and related research and innovation activities, and update references to standards.
- (3) On 24 January 2020, in accordance with Article 19(1) of Regulation (EU) 2016/796 of the European Parliament and of the Council⁴, the Commission asked the European Union Agency for Railways (the ‘Agency’) to prepare recommendations implementing a selection of the specific objectives set out in Articles 3 and 7 of Delegated Decision (EU) 2017/1474.
- (4) On 30 June 2022, the Agency issued a recommendation relating to the CCS subsystems (ERA-REC-1175-1218-2022/REC). This Regulation is based on that recommendation.
- (5) The existing regulatory framework should be modernised in order to enable new functionalities associated with the digitalisation of railway networks. The efficiency and sustainability of rail freight should be improved through further harmonisation of

¹ OJ L 138, 26.5.2016, p. 44.

² Commission Regulation (EU) 2016/919 of 27 May 2016 on the technical specification for interoperability relating to the ‘control-command and signalling’ subsystems of the rail system in the European Union (OJ L 158, 15.6.2016, p. 1).

³ Commission Delegated Decision (EU) 2017/1474 of 8 June 2017 supplementing Directive (EU) 2016/797 of the European Parliament and of the Council with regard to specific objectives for the drafting, adoption and review of technical specifications for interoperability (OJ L 210, 15.8.2017, p. 5).

⁴ Regulation (EU) 2016/796 of the European Parliament and of the Council of 11 May 2016 on the European Union Agency for Railways and repealing Regulation (EC) No 881/200 (OJ L 138, 26.5.2016, p. 1).

the European Rail Traffic Management System (ERTMS) and a broader and more systematic deployment of the ERTMS across the Union, notably on trans-European transport networks.

- (6) The new functionalities associated with digitalisation of railway networks and identified in the ERTMS Longer Term Perspective Report of the Agency required the update of the TSI on CCS subsystems. These new technologies requested by the railway sector, as well, were the Future Railway Mobile Communication System (FRMCS), automated train operations, advanced train positioning, and digital automatic couplers.
- (7) Therefore, this revision delivers both full specifications for automated train operations (grade of operations 2) and the interface to FRMCS, which were available. Full FRMCS, advanced train positioning, and digital automatic coupler specifications were not yet available due to the need for further development.
- (8) In order to keep pace with technological progress, innovative solutions may be required, which do not comply with the specifications set out in the Annex or for which the assessment methods set out in the Annex cannot be applied. Such innovative solutions, especially those coming from the Europe's Rail Joint Undertaking (ER JU), should be promoted and their voluntary implementation should, under certain conditions, be allowed. For this purpose it is appropriate to provide a process for such innovative solutions to be validated for voluntary implementation that is harmonised for all Member States.
- (9) Commission Implementing Decision (EU) 2021/1730 of 28 September 2021 on the harmonised use of the paired frequency bands 874,4-880,0 MHz and 919,4-925,0 MHz and of the unpaired frequency band 1 900-1 910 MHz for Railway Mobile Radio establishes the harmonised conditions for the availability and efficient use of radio spectrum for the Railway Mobile Radio (RMR). Member States are required to use these frequencies in order to plan the deployment of FRMCS.
- (10) The European Train Control System (ETCS) is the main signalling and control-command system used as part of the ERTMS. To adapt it to the updated needs of the rail sector, two new system versions of the ETCS (system version 2.2 and system version 3.0) are introduced in the latest update of ETCS, i.e. Baseline 4 and included in this revision. System version 2.2 is fully backwards compatible. System version 3.0 is not compatible because it includes functionalities, which are required on-board when implemented track-side.
- (11) In order to achieve further harmonisation of the ERTMS, this revision provides a new coherent transition and migration regime, ensures a robust procedure for correcting errors in specifications, reduces the scope for partial fulfilment, and phases out the need for compatibility checks.
- (12) The new transition and migration regime has been developed to provide a consistent framework for the deployment of new functionalities in relation to the CCS TSI on the rail network. The aim of this regime is to ensure a balance between the interests of railway stakeholders, in particular infrastructure managers and railway undertakings.
- (13) Considering the fact that the ERTMS is a complex software-based system requiring active specification maintenance, the Agency in its capacity of system authority for the ERTMS should support the resolution of error corrections in ERTMS specifications. To ensure safety and interoperability, the procedure to implement these error

corrections into the interoperability constituents and CCS subsystems should be specified.

- (14) Full TSI compliance ensures the achievement of the Single European Rail Area from a technical point of view. It ensures interoperable vehicles and increases their potential reuse value. Partial fulfilment was initially perceived as necessary to take into account some national constraints, but should be reduced significantly in scope in this regulation to reach the goal above.
- (15) Even a successful certification process cannot always prevent one of the subsystems repeatedly failing to function or perform as intended under certain conditions when an on-board CCS subsystem interacts with a trackside CCS subsystem. Therefore, checks should be carried out to demonstrate the technical compatibility of the CCS subsystems in the area of use for a vehicle.
- (16) The necessity of these checks should be considered a temporary measure to increase confidence in the technical compatibility between the subsystems. The principles applicable to those checks should be transparent and prepare the ground for further harmonisation. The possibility of conducting those checks in a laboratory representing the trackside configuration to be made available by the infrastructure manager should be prioritised. To reduce the checks to a minimum, each Member State should promote harmonisation within its infrastructure.
- (17) Consideration should be given to the steps required to increase, in the shortest possible time, confidence in the technical compatibility of on-board units with different trackside implementations of ERTMS; and to reduce and eliminate the tests or checks needed to prove the technical compatibility of on-board units with different trackside implementations of ERTMS. Therefore, the Agency should assess the underlying technical divergences and decide on the necessary steps to eliminate the need for tests or checks to prove the technical compatibility of on-board units with different trackside implementations.
- (18) Analysing train detection systems aims at improving the interoperability and harmonisation of the European railway system, where economically feasible. Part of this analysis is the transparent identification of non TSI compliant train detection systems.
- (19) Regulation (EU) 2016/919 should therefore be repealed.
- (20) The measures provided for in this Regulation are in accordance with the opinion of the Committee established in accordance with Article 51(1) of Directive (EU) 2016/797,

HAS ADOPTED THIS REGULATION:

Article 1

Subject matter

This Regulation establishes the technical specification for interoperability (TSI) relating to the control-command and signalling (CCS) subsystems of the rail system in the Union.

Article 2

Scope

- 1. The TSI shall apply to new trackside CCS and on-board CCS subsystems of the rail system as defined in points 2.3 and 2.4 of Annex II to Directive (EU) 2016/797.

Point 7.2.2 of Annex I to this Regulation shall apply to all changes to an existing on-board CCS subsystem.

2. The TSI shall not apply to existing trackside CCS and on-board CCS subsystems of the rail system already placed in service on all or part of any Member State's railway network by [*OP – please insert the exact date – the day of entry into force of this Regulation*].
3. However, the TSI shall apply to existing trackside and on-board CCS subsystems that have one of the following characteristics:
 - (a) the subsystem is subject to renewal or upgrading in accordance with Chapter 7 of Annex I to this Regulation;
 - (b) the area of use of a vehicle is extended in accordance with Article 54(3) of Directive (EU) 2016/797, in which case point 7.4.2.3 of the Annex I to this Regulation shall apply, unless no installation of ETCS is indicated in RINF for the subsequent five years in the new area of use and the area of use is limited to two Member States;
 - (c) the subsystem is subject to the specification maintenance requirements set out in point 7.2.10 of Annex I to this Regulation.
4. The technical and geographical scope of the TSI is set out in points 1.1 and 1.2 of Annex I.

Article 3

Open points

1. With regard to the aspects listed as 'open points' in Appendix F of Annex I to this Regulation, the conditions to be complied with for verifying the essential requirements set out in Annex III to Directive (EU) 2016/797 may be laid down by national rules in force in a Member State.
2. By [*OP – please insert exact date (within six months of the entry into force of this Regulation)*], each Member State shall submit to the Agency in accordance with the procedure under Article 25 of Regulation (EU) 2016/796 the following information, unless such information has already been communicated to either the Agency or Commission pursuant to previous version of this Regulation:
 - (a) the national rules referred to in paragraph 1;
 - (b) the conformity assessment and verification procedures to be carried out to apply the national rules referred to in paragraph 1;
 - (c) the bodies designated to carry out the conformity assessment and verification procedures with respect to the open points.

Article 4

Specific cases

1. With regard to specific cases listed in point 7.7.2 of Annex I to this Regulation, the conditions to be met for the verification of the essential requirements set out in Annex III to Directive (EU) 2016/797 shall be those laid down in point 7.7.2 of Annex I or if justified, may be laid down by national rules in force in a Member State.

2. By [*OP – please insert exact date (within six months of the entry into force of this Regulation)*], each Member State shall submit to the Agency in accordance with the procedure under Article 25 of Regulation (EU) 2016/796 the following information, unless such information has already been communicated to either the Agency or Commission pursuant to previous version of this Regulation:
- (a) the national rules referred to in paragraph 1;
 - (b) the conformity assessment and verification procedures to be carried out to apply the national rules referred to in paragraph 1;
 - (c) the bodies designated to carry out the conformity assessment and verification procedures with respect to the specific cases.

Article 5

Implementation

1. Manufacturers and applicants for authorisation for placing in service of infrastructure or for placing on the market of vehicles shall ensure that subsystems referred to in Article 2 of this Regulation and intended to be used on the networks referred to in Article 2(1) of Directive (EU) 2016/797 comply with the TSI set out in Annex I of this Regulation.
2. Manufacturers and infrastructure managers, railway undertakings, or any other entity responsible for the rail vehicle or infrastructure, shall ensure that subsystems referred to in Article 2 comply with the specification maintenance requirements set out in point 7.2.10 of Annex I.
3. Notified bodies shall ensure that certificates based on Chapter 6 of Annex I of this Regulation are issued within their responsibilities for interoperability constituents or subsystems in accordance with Articles 10 or 15 of Directive (EU) 2016/797, respectively.
4. Member States shall notify their national implementation plan drawn up in accordance with point 7.4.4 of the Annex I to the Commission and the Agency by 15 June 2024.

Article 6

Availability of ETCS, ATO and FRMCS on-board products

1. The Agency shall prepare by 1 January 2025 a report to the Commission on
 - (a) the availability of ETCS on-board products compliant with ETCS Baseline 4 specifications.
 - (b) the availability of ATO on-board products compliant with ATO Baseline 1 specifications.
 - (c) the availability of FRMCS on-board prototypes based on draft release specifications.
2. The Commission shall present its report to the Committee referred to in Article 51 of Directive (EU) 2016/797 and take appropriate measures.

Article 7

Class-B systems

1. Member States shall ensure that the functionality, performance, and interfaces of the Class-B systems remain as specified in Annex II to this regulation, unless modifications are needed to mitigate safety-critical errors in those systems.
2. Member States shall notify the Commission and the Agency about the modifications referred to in paragraph 1 and request a technical opinion of compliance from the Agency based on Article 10(1) and (3) of the EU Regulation 796/2016.

Article 8

Union funded projects

1. Financial support from Union funds for CCS related expenditure is limited to eligible costs directly related to the installation or upgrade of track-side and on-board ERTMS or related to the preparation of a future implementation of ERTMS, including train detection systems compliant with this regulation and interlockings . Financial support from Union funds may also cover on-going and future projects implementing the Recovery and Resilience Plans and ERTMS National Implementation Plans available at the entry into force of this regulation.
2. Vehicles subject to paragraph 1 that require Class B on-board systems to circulate on routes only equipped with Class-B systems may be granted Union funds, if using options indicated in the Annex I point 4.2.6.1 (1), (2), and (3) .

Article 9

Error corrections

1. Pursuant to its role as system authority for ERTMS under Article 28 of Regulation (EU) 2016/796, the Agency shall analyse all requests made to it for changes to the system. It shall prioritise change requests that it categorises as errors that potentially prevent the normal service of the rail system.
2. The Agency shall regularly provide a maintenance release of the specifications at the request of the Commission according to the specification maintenance procedure set out in Annex I to this Regulation.

Article 10

Future Railway Mobile Communication System

Where the Agency has issued an opinion with the draft release specifications relating to the Future Railway Mobile Communication System (FRMCS), manufacturers and early implementers shall use those specifications in their pilots and shall inform the Commission and the Agency about each pilot at its beginning, and keep them informed of the subsequent progress of those pilots.

Article 11

Innovative solutions

1. For innovative solutions that technological progress requires and have been approved by the System Pillar of the Europe's Rail Joint Undertaking (ERJU), the ERJU shall

submit innovative solutions to the Commission together with information on how these solutions deviate from or supplement the relevant provisions of this TSI.

2. The Commission shall request an opinion of the Agency on the innovative solution pursuant to Article 6 of Directive (EU) 2016/797
3. The Agency, as system authority, shall deliver an opinion on the innovative solution. The Commission shall analyse the Agency's opinion and may ask the ERJU to provide the appropriate functional and interface specifications and the assessment method, all of which need to be included in the TSI in order to make possible the use of the innovative solution.
4. The Commission may ask the Agency to integrate the specifications and assessment methods in an ERA recommendation pursuant to Article 5 of Directive (EU) 2016/797. Pending the review of the TSI, the Commission may ask the Agency to issue an opinion with the draft release specifications and assessment method of the innovative solution.

Article 12

ERTMS compatibility and future revision

1. By 16 June 2023, infrastructure managers shall submit to the Agency the definition of the checks for the compatibility of vehicles with the infrastructure regarding the ETCS system and the radio system for the existing lines equipped with ERTMS or GSM-R in operation. Member States shall repeal the related national rules by the same date. By 1 June 2024, the Agency shall provide the Commission with its analysis on how to phase out the checks to prove the technical compatibility of on-board units with different ERTMS trackside implementations and to achieve harmonisation of engineering and operational rules for the Single European Rail Area.

Article 13

Train-detection compatibility

1. By 31 December 2024, Member States whose infrastructure managers operate train-detection systems not compliant with this regulation must request a specific case and shall notify the Agency of these systems by informing it about:
 - (a) the interference current limits for track circuits including the evaluation methods and vehicle impedance in accordance with clause 3.2.2 of ERA/ERTMS/033281 rev 5.0.
 - (b) field limits for axle counters in X, Y, Z axis including the evaluation methods in accordance with clause 3.2.1 of ERA/ERTMS/033281 rev 5.0.
 - (c) the specific cases for train detection systems not compliant with this regulation shall use the template referred in Annex B.1 of ERA/ERTMS 033281 rev 5.0
2. By 31 December 2024, Infrastructure Managers shall inform the Agency about the required interference current limits/ frequencies from the frequency management for TSI-compliant train-detection systems as specified in sections 3.2.2.1 to 3.2.2.6 ERA/ERTMS/033281 rev 5.0 for their relevant networks. These limits/ frequencies shall be published on the Agency's website.

3. Infrastructure Managers shall update accordingly the values of the relevant parameters of the Register of Infrastructure.
4. With the publication of Specific Cases under Article 13(1), latest by 31 December 2025, Member States shall repeal all national rules concerning compatibility with train-detection systems, except for cases covered by Article 13(2)(f) of Directive (EU) 2016/797.
5. By 31 December 2027, the train detection systems specific cases and the corresponding end dates shall be re-examined, with the aim to improve the interoperability and harmonisation of the European railway system, with respect to the economic feasibility.

Article 14

Repeal and transitional provisions

Regulation (EU) 2016/919 is repealed.

It shall however continue to apply to subsystems authorised in accordance with that Regulation that do not fall under the scope of this Regulation pursuant to Article 2.

The respective chapters/tables/documents of the repealed Regulation shall continue to apply to subsystems and interoperability constituents to the extent and for as long as a transition regime that is provided for these chapters/tables/documents in this Regulation in accordance with Appendix B of Annex I.

Infrastructure Managers continue to be bound by the obligation to notify the definition of the checks for the compatibility of vehicles with the infrastructure regarding the ETCS system and the radio system for the existing lines with ERTMS or GSM-R in operation pursuant to point 6.1.2.4 of the Annex to Regulation (EU) 2016/919 by 16 January 2020. Infrastructure managers, in respect to projects started after 16 January 2020 and before the entry into force of this regulation, shall notify this information within 6 months after the entry into force of this regulation.

Article 15

Entry into force

This Regulation shall enter into force on the 20th day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels,

For the Commission
The President
Ursula von der Leyen