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## Legislation

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<sup>(1)</sup> Text with EEA relevance.

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<sup>(1)</sup> Text with EEA relevance.

## II

(Non-legislative acts)

## REGULATIONS

## COMMISSION IMPLEMENTING REGULATION (EU) 2019/772

of 16 May 2019

**amending Regulation (EU) No 1300/2014 as regards inventory of assets with a view to identifying barriers to accessibility, providing information to users and monitoring and evaluating progress on accessibility**

(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 Union <sup>(1)</sup>, and in particular Article 5(11) thereof,

Whereas:

- (1) Pursuant to Article 7 of Commission Regulation (EU) No 1300/2014 <sup>(2)</sup>, chapter 7 of the Annex of Regulation (EU) No 1300/2014 is to be amended in order to specify the characteristics of the inventory of assets, including the content, data format, functional and technical architecture, operating mode, rules for data input and consultation, and rules for self-assessment and designation of the entities responsible for data provision.
- (2) Pursuant to Article 5(1) of Regulation (EU) 2016/796 of the European Parliament and of the Council <sup>(3)</sup> and Article 7(2) of Regulation (EU) No 1300/2014 a working party was established in order to make a proposal for a recommendation as regards the minimum structure and content of data to be collected for the inventory of assets with a view to identifying barriers to accessibility, providing information to users and monitoring and evaluating progress on accessibility. That working party completed its work in May 2017, and as a result, the Agency finalised the recommendation ERA-REC-128 for amending Regulation (EU) No 1300/2014.
- (3) The Inventory of Assets is a static tool indicating the existence of the equipment and is therefore not intended to provide information on the status and functioning of the equipment.
- (4) Where a station, or elements thereof, undergoes an upgrade, renewal or any work foreseen by a national implementation plan in accordance with Article 8 of Regulation (EU) No 1300/2014, the information related to the compliance of that work with Regulation (EU) No 1300/2014 of the station, or elements thereof, should be collected.
- (5) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 51(1) of Directive (EU) 2016/797,

<sup>(1)</sup> OJ L 138, 26.5.2016, p. 44.

<sup>(2)</sup> Commission Regulation (EU) No 1300/2014 of 18 November 2014 on the technical specifications for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility (OJ L 356, 12.12.2014, p. 110).

<sup>(3)</sup> 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 881/2004 (OJ L 138, 26.5.2016, p. 1).

HAS ADOPTED THIS REGULATION:

*Article 1*

Regulation (EU) No 1300/2014 is amended as follows:

(1) The following Article 7a is inserted after Article 7

*Article 7a*

**Collection, maintenance and exchange of accessibility data**

1. Within nine months after 16 June 2019, each Member State shall decide which entities are in charge of collecting, maintaining and exchanging the accessibility data.
2. Member States may ask the Commission for an extension of the time limit. This extension shall be exceptional, duly justified and limited in time. In particular it is considered to be justified if the data collection tool and the operating modes as set out in the Annex of this regulation are not made available and fully operational by the European Union Agency for Railways two months following its entry into force.
3. For each station, there shall be an entity responsible for exchanging the accessibility data.
4. Collection and conversion of data shall be finalised within 36 months following the entry into force of this Regulation.
5. Until the architecture for data exchange described in sections 7.2, 7.3 and 7.4 of Annex I to Commission Regulation (EU) No 454/2011 (\*) is completely operational, the exchange of the accessibility data shall consist of transfer of that data to the European Railway Stations Accessibility Database (ERSAD) hosted by the European Union Agency for Railways.

(\*) Commission Regulation (EU) No 454/2011 of 5 May 2011 on the technical specification for interoperability relating to the subsystem “telematics applications for passenger services” of the trans-European rail system (OJ L 123, 12.5.2011, p. 11).’

(2) The Annex is amended in accordance with the Annex to this Regulation.

*Article 2*

This Regulation shall enter into force on the twentieth 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, 16 May 2019.

*For the Commission*  
*The President*  
Jean-Claude JUNCKER

## ANNEX

The Annex to Regulation (EU) No 1300/2014 is amended as follows:

(1) In Chapter 2, section 2.3, the following paragraph is inserted after the first sentence:

*'Accessibility data*

Accessibility data consists of the information related to the accessibility of passenger railway stations that needs to be collected, maintained and exchanged, that is to say, of a description of the characteristics and equipment of the passenger railway stations. Where relevant that description is complemented by the information regarding the stations' state of conformity to this TSI.'

(2) In Chapter 7, section 7.2, sub-section 7.2.1, the following sub-sections are inserted:

7.2.1.1. Inventory of assets — infrastructure

7.2.1.1.1. Functional and technical architecture

The functions of the inventory of assets consist of:

- (1) identifying the existing obstacles and barriers to accessibility;
- (2) providing practical information to users;
- (3) monitoring and evaluating progress on accessibility.

The architecture for the exchange of accessibility data is provided for in Regulation (EU) No 454/2011 (TAP TSI).

The following standards shall apply for the formatting and exchange of accessibility data:

- (1) CEN/TS 16614-1:2014 Public transport — Network and Timetable Exchange (NeTEx) — Part 1: Public transport network topology exchange format 2014-05-14
- (2) EN 12896-1:2016 Public transport. Reference data model. Common concepts (Transmodel)

For the intended particular usage, a harmonised specific transmodel profile as is provided for in the technical documents referred to in Appendix O, index 1.

7.2.1.1.2. Rules for the input and self-assessment of accessibility data

The rules for the input and self-assessment of accessibility data shall be the following:

- (1) entities that collect the accessibility data relative to assets need not be independent from the daily management of those assets;
- (2) during the first collection of accessibility data pursuant to the entry into force of Commission Implementing Regulation (EU) 2019/772 (\*), the state of conformity of stations to this TSI may be inventoried as unassessed;
- (3) where a station, or elements thereof, undergoes an upgrade, renewal work or any type of work foreseen by a national implementation plan for this TSI, the corresponding accessibility data shall be updated, including the state of conformity to this TSI, where relevant;
- (4) the state of conformity to this TSI may be updated on the basis of an ISV as described in point 6.2.4 of this TSI;
- (5) the working order of the equipment does not need to be inventoried.

A data collection tool, the operating modes of which are described in the technical documents referred to in Appendix O, index 2, shall be made available by the Commission.

Alternatively, where structured accessibility data exist and may be converted to the harmonised profile, those data may be transferred after conversion. The methodology for the conversion of existing accessibility data and the communication protocol are provided for in the technical documents referred to in Appendix O, index 3.

#### 7.2.1.1.3. Rules for consultation

From the ERSAD:

- (1) the public shall be able to access information from a public website hosted by the European Union Agency for Railways;
- (2) registered national authorities shall be able to retrieve all accessibility data that are relevant to the Member State;
- (3) the Commission and the Agency shall be able to retrieve all accessibility data.

The ERSAD database hosted by the Agency shall not be linked to other database(s).

#### 7.2.1.1.4. Rules for the management of user feedback

Feedback from users may take the form of:

- (1) institutional feedback from users associations, including organisations representing persons with disabilities: existing structures may be used as long as they include representatives from organisations of persons with disabilities and persons with reduced mobility and reflect the situation at an appropriate level, not necessarily at a national level. The procedure for giving user feedback shall be organised so as to permit the participation of those organisations on an equal basis;
- (2) individual feedback: website visitors shall be provided with the possibility to report incorrect information about accessibility data regarding a particular station and get an acknowledgement that their comment has been received.

In both situations, the feedback from users shall be adequately considered by the entity(ies) responsible for collecting, maintaining and exchanging the data.

(\*) Commission Implementing Regulation (EU) 2019/772 of 16 May 2019 amending Commission Regulation (EU) No 1300/2014 as regards inventory of assets with a view to identifying barriers to accessibility, providing information to users and monitoring and evaluating progress on accessibility (OJ L 139 I, 27.5.2019, p. 1).'

- (3) The following Appendix is added:

#### *Appendix O*

#### **List of technical documents**

Index No	Label
1	Harmonised specific Network and Timetable Exchange (NeTEx) profile used for the description of stations.
2	Data collection tool operating modes
3	Methodology for the conversion of existing accessibility data including description of the external interface and of the communication protocol.'

**COMMISSION IMPLEMENTING REGULATION (EU) 2019/773****of 16 May 2019****on the technical specification for interoperability relating to the operation and traffic management subsystem of the rail system within the European Union and repealing Decision 2012/757/EU****(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 Union <sup>(1)</sup>, and in particular Article 5(11) thereof,

Whereas:

- (1) Article 11 of Commission Delegated Decision (EU) 2017/1474 <sup>(2)</sup> sets out the specific objectives for drafting, adoption and review of technical specifications for interoperability (TSIs) of the rail system within the Union.
- (2) Pursuant to points (b) and (f) of Article 3(5) of Decision (EU) 2017/1474 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) Pursuant to point (c) of Article 3(5) of Decision (EU) 2017/1474 TSIs should be reviewed in order to close the remaining open points. In particular, the scope of the open points for operations is to be defined and a distinction is to be made between national applicable rules and rules requiring harmonisation through Union law in order to allow for migration to an interoperable system defining the optimal level of technical harmonisation.
- (4) On 22 September 2017, in accordance with Article 19(1) of Regulation (EU) 2016/796 of the European Parliament and of the Council <sup>(3)</sup>, the Commission requested the European Union Agency for Railways (the 'Agency') to prepare recommendations implementing a selection of the specific objectives set out in Decision (EU) 2017/1474.
- (5) On 25 October 2018, the Agency issued the recommendation ERA-REC-125 as regards the technical specification for interoperability (TSI) relating to the operation and traffic management subsystem of Union rail system, covering paragraphs 1 to 6 of Article 11 of Commission Delegated Decision (EU) 2017/1474.
- (6) Commission Decision 2012/757/EU <sup>(4)</sup> has been amended on several occasions. In order to ensure the readability and the legal certainty, it is advisable to repeal it and replace it by this Regulation.
- (7) Decision 2012/757/EU should thus be repealed.
- (8) This Regulation should provide the implementation dates for the different requirements of the TSI relating to the 'operation and traffic management' subsystem of the Union rail system. The implementation dates should take into account that certain Member States have notified the Agency and the Commission in accordance with Article 57(2) of Directive (EU) 2016/797 and certain Member States that have not.

<sup>(1)</sup> OJ L 138, 26.5.2016, p. 44.

<sup>(2)</sup> 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).

<sup>(3)</sup> 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 881/2004 (OJ L 138, 26.5.2016, p. 1).

<sup>(4)</sup> Commission Decision 2012/757/EU of 14 November 2012 concerning the technical specification for interoperability relating to the operation and traffic management subsystem of the rail system in the European Union and amending Decision 2007/756/EC (OJ L 345, 15.12.2012, p. 1).

- (9) The changes of process and responsibilities brought by Article 23 of Directive (EU) 2016/797 and by Section 4.2.2.5 and Appendix D1 of the Annex to this Regulation should be managed by the railway undertakings and where appropriate the infrastructure managers, through their respective safety management system. Moreover, railway undertakings should apply for an update of their safety certificates in accordance with Article 10(13) of Directive (EU) 2016/798 of the European Parliament and of the Council <sup>(5)</sup>, if due to Article 23 the type or the extent of its operations are substantially altered, or a safety certification body so requires in accordance with Article 10(15) of Directive (EU) 2016/798.
- (10) If Member States trigger the deficiency procedure in accordance with Article 6 of Directive (EU) 2016/797, the Commission and the Agency, where appropriate, should act in a timely manner to rectify the situation and issue an opinion constituting an acceptable means of compliance or correct this Regulation.
- (11) 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*

This Regulation lays down the technical specification for interoperability (TSI) relating to the operation and traffic management subsystem of Union rail system, as set out in the Annex.

The TSI set out in the Annex shall apply to the operation and traffic management subsystem set out in point 2.5 of Annex II to Directive (EU) 2016/797.

#### *Article 2*

Member States shall notify the following types of agreement to the Commission by 1 January 2020, where they have not already been notified pursuant to Commission Decisions 2006/920/EC <sup>(6)</sup>, 2008/231/EC <sup>(7)</sup>, 2011/314/EU <sup>(8)</sup> or 2012/757/EU:

- (a) bilateral or multilateral agreements between railway undertakings, infrastructure managers or safety authorities that deliver significant levels of local or regional interoperability;
- (b) international agreements between one or more Member States and at least one third country, or between Member State(s) railway undertakings or infrastructure managers and at least one railway undertaking or infrastructure manager of a third country, that deliver significant levels of local or regional interoperability.

#### *Article 3*

The conditions to be complied with for verifying the interoperability pursuant to Article 13 of Directive (EU) 2016/797 shall be as set out in the national rules applicable in the Member State where the operation takes place, in the following situations:

- (a) in the specific situations referred to in point 7.2 of the Annex to this Regulation;
- (b) with regard to the topics listed as open points and areas for national rules referred to in Appendix I to that Annex.

#### *Article 4*

By 1 July 2019 at the latest, the Agency shall publish a guide on the application of the operation and traffic management subsystem (application guide). The Agency shall keep the application guide up to date.

<sup>(5)</sup> Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety (OJ L 138, 26.5.2016, p. 102).

<sup>(6)</sup> Commission Decision 2006/920/EC of 11 August 2006 concerning the technical specification of interoperability relating to the subsystem Traffic Operation and Management of the trans-European conventional rail system (OJ L 359, 18.12.2006, p. 1).

<sup>(7)</sup> Commission Decision 2008/231/EC of 1 February 2008 concerning the technical specification of interoperability relating to the operation subsystem of the trans-European high-speed rail system adopted referred to in Article 6(1) of Council Directive 96/48/EC and repealing Commission Decision 2002/734/EC of 30 May 2002 (OJ L 84, 26.3.2008, p. 1).

<sup>(8)</sup> Commission Decision 2011/314/EU of 12 May 2011 concerning the technical specification for interoperability relating to the 'operation and traffic management' subsystem of the trans-European conventional rail system (OJ L 144, 31.5.2011, p. 1).



*Article 5*

Decision 2012/757/EU is repealed with effect from 16 June 2021.

However, Appendix A and C of the Annex to Decision 2012/757/EU may continue to apply by 16 June 2024 at the latest.

*Article 6*

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

It shall apply from 16 June 2021.

However, Sections 4.2.2.1.3.2 and 4.4 of the Annex shall apply from 16 June 2019.

Section 4.2.2.5 and Appendix D1 of the Annex to this Regulation shall apply from 16 June 2019 in the Member States that have not notified the Agency and the Commission in accordance with Article 57(2) of Directive (EU) 2016/797.

Section 4.2.2.5 and Appendix D1 of the Annex to this Regulation shall apply from 16 June 2020 in the Member States that have notified the Agency and the Commission in accordance with Article 57(2) of Directive (EU) 2016/797.

Appendix A and C of the Annex to this regulation shall apply from 16 June 2024 at the latest.

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

Done at Brussels, 16 May 2019.

*For the Commission*  
*The President*  
Jean-Claude JUNCKER

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## 1. INTRODUCTION

### 1.1. **Technical scope**

This Technical Specification for Interoperability (TSI) covers the 'operation and traffic management' subsystem shown in the list contained in point 1 and defined in point 2.5 of Annex II to Directive (EU) 2016/797.

### 1.2. **Geographical scope**

The geographical scope of this Regulation is the Union's network as specified in section 1 to Annex I of Directive (EU) 2016/797 and excludes the cases referred to in Article 1(3) and 1(4) of Directive (EU) 2016/797.

### 1.3. **Content of this Regulation**

In accordance with Article 4(3) of Directive (EU) 2016/797, this Regulation:

- (a) indicates its intended scope for the 'operation and traffic management' subsystem;
- (b) lays down essential requirements for the subsystem concerned and its interfaces *vis-à-vis* other subsystems;
- (c) establishes the functional and technical specifications to be met by the target subsystem and its interfaces *vis-à-vis* other subsystems. If necessary, these specifications may vary according to the use of the subsystem;
- (d) determines the interoperability constituents and interfaces covered by European specifications, including European standards, which are necessary to achieve interoperability within the European rail system;
- (e) states, in each case under consideration, which procedures are to be used in order to assess the conformity or suitability for use of the interoperability constituents;
- (f) indicates the strategy for implementing the TSI. In particular, it is necessary to specify the stages to be completed and the elements that may be applied in order to make a gradual transition from the existing situation to the final situation in which compliance with the TSI shall be the norm;
- (g) indicates, for the staff concerned, the professional qualifications and health and safety conditions at work required for the operation and maintenance of the subsystem concerned, as well as for the implementation of the TSI;
- (h) indicates the provisions applicable to the existing non TSI conform subsystems and vehicles, in particular in the event of upgrading and renewal and, in such cases, the modification work which requires an application for a new authorisation;
- (i) indicates the parameters of the vehicles and fixed subsystems to be checked by the railway undertaking and the procedures to be applied to check those parameters after the delivery of the vehicle authorisation for placing on the market and before the first use of the vehicle to ensure compatibility between vehicles and the routes on which they are to be operated.

Moreover, in accordance with Article 4(5) of Directive (EU) 2016/797, provision may be made for specific cases for each TSI.

## 2. DESCRIPTION OF SCOPE

### 2.1. **Staff and trains**

Points 4.6 and 4.7 apply to those staff undertaking the safety-critical tasks associated with accompanying a train.

Point 4.6.2 applies to train drivers without prejudice to point 8 of Annex VI to Directive 2007/59/EC of the European Parliament and of the Council <sup>(1)</sup>.

<sup>(1)</sup> Directive 2007/59/EC of the European Parliament and of the Council of 23 October 2007 on the certification of train drivers operating locomotives and trains on the railway system in the Community (OJ L 315, 3.12.2007, p. 51).

For those staff undertaking the safety-critical tasks associated with despatching trains and authorising train movements, mutual recognition of professional qualifications and health and safety conditions between Member States shall apply.

For those staff undertaking the safety-critical tasks associated with the last preparation of a train before it is scheduled to cross a border(s) and work beyond any location(s) designated as the 'frontier' in the network statement of an infrastructure manager and included in its safety authorisation, point 4.6 shall apply while mutual recognition between Member States shall apply for point 4.7. A train shall not be considered to be a cross border service, if it complies with the conditions of point (8) of Article 10 of Directive (EU) 2016/798.

## 2.2. Principles

This Regulation covers those elements of the rail 'operation and traffic management' subsystem, where there are operational interfaces between railway undertakings and infrastructure managers and where there is a particular benefit to interoperability.

Railway undertaking and infrastructure manager shall ensure that all requirements concerning rules and procedures as well as documentation are met by the establishment of the appropriate processes. The set-up of these processes is a relevant part of railway undertaking's and infrastructure manager's safety management system (hereinafter referred to as 'SMS') as required by Directive (EU) 2016/798. The SMS itself is assessed by the relevant national safety authority (hereinafter referred to as 'NSA') before granting safety authorisation and by the European Union Agency for Railways or the relevant NSA before granting safety certificate.

## 2.3. Applicability to existing non TSI conform vehicles and infrastructure

While the majority of the requirements contained in this Regulation relates to processes and procedures, a number also relates to physical elements of vehicles and infrastructure that are important for their operational function in the context of this Regulation.

Those physical elements are specified in the structural TSIs covering other subsystems than operation and traffic management. They have to be assessed according to the procedures defined in those TSIs.

None of the provisions of this Regulation shall be used to justify a national rule under a structural TSI.

## 3. ESSENTIAL REQUIREMENTS

### 3.1. Compliance with the essential requirements

In accordance with Article 3 of Directive (EU) 2016/797, the Union rail system, its subsystems and their interoperability constituents shall meet the essential requirements set out in general terms in Annex III to that Directive.

### 3.2. Essential requirements — overview

The essential requirements cover:

- safety,
- reliability and availability,
- health,
- environmental protection,
- technical compatibility,
- accessibility.

According to Directive (EU) 2016/797, the essential requirements may be generally applicable to the whole Union rail system or be specific to each subsystem and its constituents.

The following table summarises the correspondence between the essential requirements set out in Annex III to Directive (EU) 2016/797 and this Regulation.

Clause	Clause Title	Safety					Reliability & Availability	Health		Environmental protection					Technical compatibility	Accessibility		Essential requirements specific to operation and traffic management					
		1.1.1	1.1.2	1.1.3	1.1.4	1.1.5		1.2	1.3.1	1.3.2	1.4.1	1.4.2	1.4.3	1.4.4		1.4.5	1.5	1.6.1	1.6.2	2.6.1	2.6.2	2.6.3	2.6.4
4.2.1.2	Documentation for drivers						X												X		X		
4.2.1.2.1	Driver's Rule book																		X		X		
4.2.1.2.2	Route book																		X		X		
4.2.1.2.2.1	Preparation of the Route book																		X				
4.2.1.2.2.2	Modification to Information contained within the route book																		X		X		
4.2.1.2.2.3	Informing the driver in real time																		X	X	X		
4.2.1.2.3	Time tables																		X	X	X		
4.2.1.2.4	Rolling stock						X												X		X		
4.2.1.3	Documentation for railway undertaking staff other than drivers						X												X		X		
4.2.1.4	Documentation for infrastructure manager's staff authorising train movements						X												X	X			
4.2.1.5	Safety-related communications between train crew, other railway undertaking staff and staff authorising train movements						X												X	X	X		
4.2.2.1	Train visibility	X																	X		X		
4.2.2.1.1	General requirement	X																	X		X		
4.2.2.1.2	Front end	X																	X		X		
4.2.2.1.3	Rear end	X																	X		X		
4.2.2.2	Train audibility	X																	X		X		
4.2.2.2.1	General requirement	X																	X		X		
4.2.2.2.2	Control	X																			X		
4.2.2.3	Vehicle identification						X												X		X		
4.2.2.4	Safety of passengers and load																		X				
4.2.2.5	Route Compatibility and Train composition																		X				
4.2.2.5.1	Route Compatibility																		X				



Clause	Clause Title	Safety					Reliability & Availability	Health		Environmental protection					Technical compatibility	Accessibility		Essential requirements specific to operation and traffic management			
		1.1.1	1.1.2	1.1.3	1.1.4	1.1.5	1.2	1.3.1	1.3.2	1.4.1	1.4.2	1.4.3	1.4.4	1.4.5	1.5	1.6.1	1.6.2	2.6.1	2.6.2	2.6.3	2.6.4
4.2.2.5.2	Train composition																	X			
4.2.2.6	Train braking		X															X		X	
4.2.2.6.1	Minimum requirements of the braking system		X															X		X	
4.2.2.6.2	Braking performance		X															X		X	
4.2.2.7	Ensuring that the train is in running order		X															X		X	
4.2.2.7.1	General requirement																	X		X	
4.2.2.7.2	Pre-departure Data																	X		X	
4.2.2.8	Requirements for Signal and line-side marker sighting													X				X			
4.2.2.9	Driver vigilance																	X			
4.2.3.1	Train planning		X																X	X	
4.2.3.2	Identification of trains																	X	X	X	
4.2.3.3	Train departure																	X		X	
4.2.3.3.1	Checks and tests before departure		X				X											X		X	
4.2.3.3.2	Informing the infrastructure manager of the train's operational status		X				X												X	X	
4.2.3.4	Traffic management																	X	X	X	
4.2.3.4.1	General requirements																	X	X	X	
4.2.3.4.2	Train reporting																	X	X	X	
4.2.3.4.2.1	Data required for train position reporting																	X		X	
4.2.3.4.2.2	Predicted hand over time																	X		X	
4.2.3.4.3	Dangerous goods																	X	X		
4.2.3.4.4	Operational quality																		X	X	
4.2.3.5	Data recording						X												X		
4.2.3.5.1	Recording of supervision data outside the train						X												X		

Clause	Clause Title	Safety					Reliability & Availability	Health		Environmental protection					Technical compatibility	Accessibility		Essential requirements specific to operation and traffic management			
		1.1.1	1.1.2	1.1.3	1.1.4	1.1.5	1.2	1.3.1	1.3.2	1.4.1	1.4.2	1.4.3	1.4.4	1.4.5	1.5	1.6.1	1.6.2	2.6.1	2.6.2	2.6.3	2.6.4
4.2.3.5.2	Recording of supervision data on-board the train						X												X		
4.2.3.6	Degraded operation																	X	X	X	
4.2.3.6.1	Advice to other users																	X		X	
4.2.3.6.2	Advice to train drivers																	X			
4.2.3.6.3	Contingency arrangements																	X	X	X	
4.2.3.7	Managing an emergency situation																	X	X	X	
4.2.3.8	Aid to train crew in the event of an incident or of a major rolling stock malfunction																			X	
4.4	ERTMS operating rules																	X	X		
4.6	Professional qualifications																	X	X	X	
4.7	Health and safety conditions																	X			
4.8	Additional information on infrastructure and vehicles																	X			
4.8.1	Infrastructure																	X			
4.8.2	vehicles																	X			

#### 4. CHARACTERISTICS OF THE SUBSYSTEM

##### 4.1. Introduction

In accordance with Directive 2012/34/EU of the European Parliament and of the Council <sup>(2)</sup>, it is the overall responsibility of the infrastructure manager to provide all the appropriate requirements which shall be met by trains permitted to run on its network, taking into account the geographic particularities of individual lines and the functional or technical specifications set out in this Chapter.

##### 4.2. Functional and technical specifications of the subsystem

The functional and technical specifications of the 'operation and traffic management' subsystem comprise of the following:

- specifications relating to staff,
- specifications relating to trains,
- specifications relating to train operations.

<sup>(2)</sup> Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area (OJ L 343, 14.12.2012, p. 32).

#### 4.2.1. *Specifications relating to staff*

##### 4.2.1.1. General requirements

This point deals with staff who contributes to the operation of the subsystem by performing safety-critical tasks involving a direct interface between a railway undertaking and an infrastructure manager.

(1) Railway undertaking staff:

- (a) undertaking the task of driving trains ('driver') and forming part of the 'train crew',
- (b) undertaking tasks on-board (other than driving) and forming part of the 'train crew',
- (c) undertaking the task of preparing trains.

(2) Infrastructure manager's staff undertaking the task of authorising the movement of trains

The areas covered are:

- Documentation
- Communication

In addition, for the staff as defined in point 2.1, this Regulation sets out requirements on:

- Qualifications (see point 4.6 and Appendix G)
- Health and safety conditions (see point 4.7)

##### 4.2.1.2. Documentation for drivers

The railway undertaking operating the train shall supply the driver with all the necessary information and documentation required to carry out her/his duties; they may be paper based or in electronic format.

This information shall take into account the necessary elements for operation in normal, degraded and emergency situations for the routes to be worked over and the rolling stock used on those routes.

##### 4.2.1.2.1. *Driver's Rule Book*

All the necessary procedures for the driver shall be included in a document or a computer medium called the 'Driver's Rule Book'.

The Driver's Rule Book shall state the requirements for all the routes worked and the rolling stock used on those routes according to the situations of normal operation, degraded operation and in emergency situations which the driver may encounter.

The Driver's Rule Book shall cover two distinct aspects:

- one which describes the set of common rules and procedures (taking into account the contents of Appendices A, B and C),
- another which sets out any necessary rules and procedures specific to each infrastructure manager.

It shall include procedures covering, as a minimum, the following aspects:

- Staff safety and security,
- Signalling and control command,
- Train operation including degraded mode,
- Traction and rolling stock,
- Incidents and accidents.

The railway undertaking shall be responsible for the Driver's Rule Book and compile it in such a way that it is complete and accurate, and the driver's application of all operational rules is enabled.

The railway undertaking must present the Driver's Rule Book in a clear format for the entire infrastructure over which their drivers will work.

It shall have two appendices:

- Appendix 1: Manual of communication procedures;
- Appendix 2: Book of Forms.

Predefined messages and forms shall at least exist in the 'operating' language(s) of infrastructure manager(s).

The railway undertaking's process for preparing and updating the Driver's Rule Book shall include the following steps:

- the infrastructure manager (or the organisation responsible for the preparation of the operating rules) shall provide the railway undertaking with the appropriate information in the infrastructure manager's operating language,
- the railway undertaking shall draw up the initial or updated document;
- if the language chosen by the railway undertaking for the Driver's Rule Book is not the language in which the appropriate information was originally supplied, it is the responsibility of the railway undertaking to arrange for any necessary translation and/or provide explanatory notes in another language.

The infrastructure manager shall ensure that the content of the documentation provided to the railway undertaking(s) is complete and accurate.

#### 4.2.1.2.2. *Description of the line and the relevant line-side equipment associated with the lines worked over*

Drivers shall be provided with a description of the lines and the associated line-side equipment for the lines over which they shall operate and relevant to the driving task. Such information shall be set out in a single document called the 'Route Book'.

The following is a list of information which shall, as a minimum, be provided:

- the general operating characteristics,
- indication of rising and falling gradients,
- detailed line diagram.

#### 4.2.1.2.2.1. Preparation of the Route Book

The format of the Route Book shall be prepared in the same manner for all the infrastructures worked over by the trains of an individual railway undertaking.

The railway undertaking is responsible for the complete and correct compilation of the Route book, using the information supplied by the infrastructure manager(s). The railway undertaking shall ensure that the content of the Route Book is complete and accurate, including when grouping the modifications to information contained within the Route book. The railway undertaking shall ensure the route book duly describes operational conditions related to line characteristics and vehicle characteristics.

The infrastructure manager shall provide the railway undertaking with at least the information for the route book as defined in Appendix D2 through RINF. This information shall include relevant information that shall be taken into account to adapt train operation to line characteristics and vehicle characteristics. Until RINF provides the relevant parameters in accordance with Article 6 of Commission Implementing Regulation (EU) 2019/777 <sup>(3)</sup>, the infrastructure manager shall provide this information through other means free of charge and as soon as reasonably possible and in any event within 15 days for the first submission unless the railway undertaking agrees a longer deadline.

The infrastructure manager shall inform the railway undertaking of the changes on the information of the route book through RINF whenever such information becomes available or through other means until RINF allows for such functionality.

<sup>(3)</sup> Commission Implementing Regulation (EU) 2019/777 of 16 May 2019 on the common specifications for the register of railway infrastructure and repealing Implementing Decision 2014/880/EU (See page 312 of this Official Journal).

The infrastructure manager shall ensure that the information provided to the railway undertaking(s) is complete and accurate. For emergency situations or real time information appropriate alternative means of communication of the infrastructure manager shall ensure immediate information to the railway undertaking about Appendix D2.

#### 4.2.1.2.2.2. Modifications to information contained within the Route Book

The infrastructure manager shall advise the railway undertaking of any permanent or temporary modifications to information supplied in accordance with point 4.2.1.2.2.1.

These changes shall be grouped by the railway undertaking into a dedicated document or computer medium whose format shall be the same for all the infrastructures worked over by the trains of an individual railway undertaking.

#### 4.2.1.2.2.3. Informing the driver in real time

The infrastructure manager shall inform drivers of any changes to the line or relevant lineside equipment that have not been advised as modifications to information for the Route Book as set out in point 4.2.1.2.2.2.

#### 4.2.1.2.3. *Timetables*

The provision of train schedule information facilitates the punctual running of trains and assists in service performance.

The railway undertaking shall provide drivers with the information necessary for the normal running of the train and as a minimum include:

- the train identification;
- the train running days (if necessary);
- the stopping points and the activities associated with them
- other timing points;
- the arrival/departure/passing times at each of those points.

Such train running information, which shall be based on information supplied by the infrastructure manager, may be provided either electronically or in a paper format.

Presentation to the driver shall be consistent across all the lines over which the railway undertaking operates.

#### 4.2.1.2.4. *Rolling stock*

The railway undertaking shall provide the driver with all information relevant to the working of the rolling stock during degraded situations (such as trains requiring assistance). Such documentation shall also focus on the specific interface with the infrastructure manager's staff in these cases.

#### 4.2.1.3. Documentation for railway undertaking staff other than drivers

The railway undertaking shall provide all members of its staff (whether on train or otherwise) who undertake safety-critical tasks involving a direct interface with the staff, equipment or systems of the infrastructure manager with the rules, procedures, rolling stock and route specific information it deems appropriate to such tasks. Such information shall be applicable in both normal and degraded operation.

For staff on-board trains, the structure, format, content and process for preparation and updating of such information shall be based on the specification set out in Subsection 4.2.1.2.

#### 4.2.1.4. Documentation for infrastructure manager's staff authorising train movements

All the information necessary to ensure safety-related communication between staff authorising the movement of trains and train crews shall be set out in:

- documents describing the Communications Principles (Appendix C);
- the document entitled Book of forms.

The infrastructure manager shall draw up these documents in all its operating language(s).

4.2.1.5. Safety-related communications between train crew, other railway undertaking staff and staff authorising train movements

The language used for safety-related communication between train crew, other railway undertaking staff (as defined in Appendix G) and the staff authorising train movements is the operating language(s) (as defined in Appendix J) used by the infrastructure manager on the route concerned.

The principles for safety-related communication between train crew and staff responsible for authorising the movement of trains are to be found in Appendix C.

In accordance with Directive 2012/34/EU, the infrastructure manager is responsible for publishing the 'operating' language(s) used by its personnel in daily operational use.

Where, however, local practice requires that a second language is also provided for, it is the responsibility of the infrastructure manager to determine the geographic boundaries for its use.

4.2.2. *Specifications relating to trains*

4.2.2.1. Train visibility

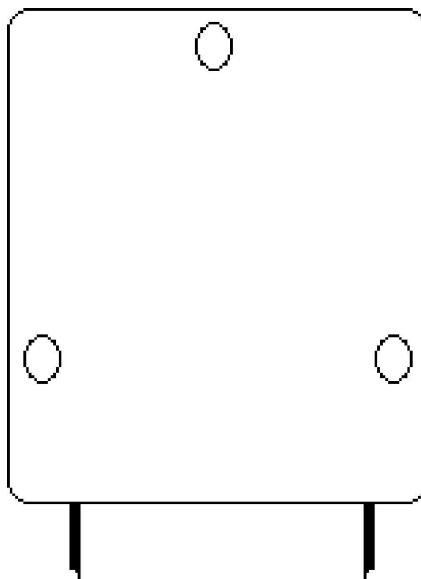
4.2.2.1.1. *General requirement*

The railway undertaking shall ensure that trains are fitted with means of indicating the front and rear of the train.

4.2.2.1.2. *Front-end*

The railway undertaking shall ensure that an approaching train is clearly visible and recognisable as such, by the presence and layout of its lit white front-end lights.

The forward facing front-end of the leading vehicle of a train shall be fitted with three lights in an isosceles triangle, as shown below. These lights shall always be lit when the train is being driven from that end.



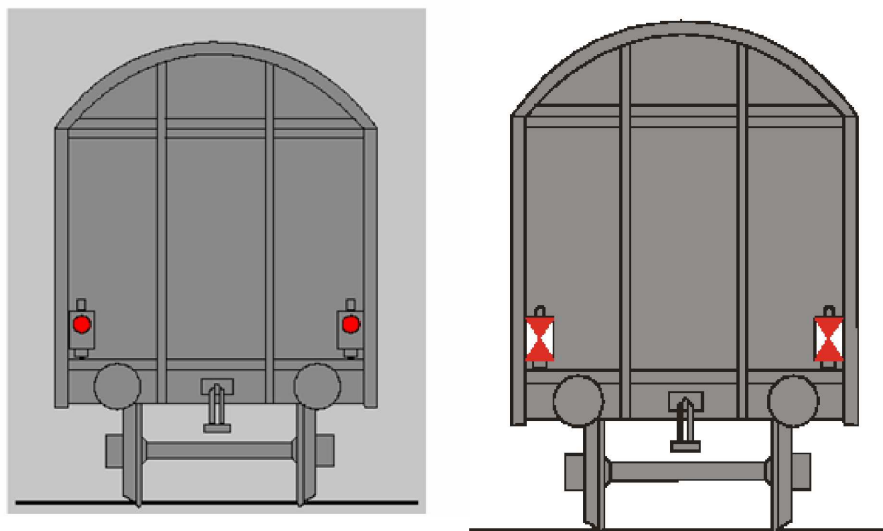
The front-end lights shall optimise train detectability (marker lights), provide sufficient visibility for the train driver (head lights) by night and during low light conditions and shall not dazzle the drivers of oncoming trains.

The spacing, the height above rails, the diameter, the intensity of the lights, the dimensions and shape of the emitted beam in both day and night time operation are defined in the 'rolling stock — locomotives and passenger rolling stock' TSI ('LOC&PAS TSI').

By the dates mentioned below for the harmonisation of the rear end signal as per section 4.2.2.1.3.2, the luminous intensity of vehicle headlamps shall be in accordance with point (5) of section 4.2.7.1.1 of the Annex to Commission Regulation (EU) No 1302/2014 (\*) (Loc&Pas TSI) in order to access the lines identified in RINF where permissive driving is used.

#### 4.2.2.1.3. Rear end

The railway undertaking shall provide the required means of indicating the rear of a train. The rear end signal shall only be exhibited on the rear of the last vehicle of the train. It shall be displayed as shown below.



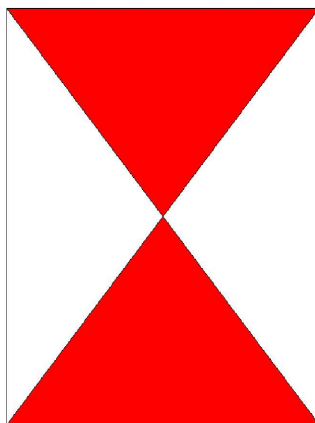
##### 4.2.2.1.3.1. Passenger trains

The rear end signal of a passenger train shall consist of 2 steady red lights at the same height above buffer on the transversal axis.

##### 4.2.2.1.3.2. Freight trains

The rear end signal of a freight train shall consist of 2 reflective plates at the same height above buffer on the transversal axis. Any train equipped with 2 steady red lights shall also be considered to comply with this obligation.

Reflective plates shall comply with Appendix E to Wagon TSI and have the following shape with white side triangles and red top and bottom triangle:



The plates shall be on the same height above buffer on the transversal axis

(\*) Commission Regulation (EU) No 1302/2014 of 18 November 2014 concerning a technical specification for interoperability relating to the 'rolling stock — locomotives and passenger rolling stock' subsystem of the rail system in the European Union (OJ L 356, 12.12.2014, p. 228).

*Specific cases:*

Belgium, France, Italy, Portugal, Spain and UK may continue to apply notified national rules that require freight trains to be equipped with 2 steady red lights as a condition to run on sections of their network, where this is justified by operating practices already in place and/or national rules notified before end of January 2019.

*Reports:*

At the latest by 30 September 2020, the concerned Member States shall deliver to the Commission reports on their use of reflective plates, identifying any serious obstacles to the planned elimination of national rules.

*Cooperation with neighbouring countries:*

In the meantime Member States concerned, in particular at the request of the railway undertakings, shall perform an assessment with a view to accept the use of 2 reflective plates in one or more sections of their network if the result of the assessment is positive and define appropriate conditions, which shall be based upon an assessment of the risks and operational requirements. This assessment shall be completed within a maximum period of 6 months after receiving the railway undertaking's request. The acceptance of reflective plates shall be granted, unless the Member State can duly justify the refusal based on the negative result of the assessment.

Member States shall in particular endeavour to permit the use of reflective plates on rail freight corridors, with a view to prioritise the current bottlenecks. These sections and details of any conditions pertaining to them shall be recorded in the RINF. Until the information is encoded in RINF, the infrastructure manager shall ensure the information is communicated to railway undertakings by other appropriate means. The infrastructure manager shall identify the sections of lines on which 2 steady red lights are required in the RINF.

*Phasing out:*

By 31 March 2021, the Commission shall, on the basis of a recommendation from the Agency and taking into account the findings in the reports delivered by Member States, review the dates and specifications with a view of harmonising the rear end signal to have reflective plates accepted for the whole Union, bearing in mind the safety and capacity concerns as well as cost impact during the transition.

Unless such revision provides otherwise the following deadlines shall apply for accepting freight trains equipped with 2 reflective plates:

- (1) From 1 January 2022, along the rail freight corridors specified in accordance with Regulation (EU) No 913/2010 of the European Parliament and of the Council <sup>(5)</sup>.
- (2) From 1 January 2026, in the whole European Union rail network.

The Commission shall report to the committee referred to in Article 51 of Directive (EU) 2016/797 on the implementation progress of section 4.2.2.1.

#### 4.2.2.2. Train audibility

##### 4.2.2.2.1. General requirement

The railway undertaking shall ensure that trains are fitted with an audible warning device to indicate the approach of a train.

##### 4.2.2.2.2. Control

The activation of the audible warning device shall be possible from all driving positions.

<sup>(5)</sup> Regulation (EU) No 913/2010 of the European Parliament and of the Council of 22 September 2010 concerning a European rail network for competitive freight (OJ L 276, 20.10.2010, p. 22).



#### 4.2.2.3. Vehicle identification

Each vehicle shall have a number to uniquely identify it from any other rail vehicle. This number shall be prominently displayed at least on each longitudinal side of the vehicle.

It shall also be possible to identify operational restrictions applicable to the vehicle.

Further requirements are specified in Appendix H.

#### 4.2.2.4. Safety of passengers and load

##### 4.2.2.4.1. *Safety of load*

The railway undertaking shall make sure that freight vehicles are safely and securely loaded and remain so throughout the journey.

##### 4.2.2.4.2. *Safety of passengers*

The railway undertaking shall ensure that passenger transport is undertaken safely at the departure and during the journey.

#### 4.2.2.5. Route compatibility and train composition

##### 4.2.2.5.1. *Route compatibility*

(A) The railway undertaking is responsible for ensuring that all vehicles composing its train are compatible with the intended route(s).

The railway undertaking shall have a process in its SMS to ensure that all vehicles it uses are authorised, registered and compatible with the intended route(s) including the requirements to be followed by its staff.

The route compatibility process shall not duplicate processes performed as part of the vehicle authorisation under Commission Implementing Regulation (EU) 2018/545 <sup>(6)</sup> to ensure technical compatibility between the vehicle and the network(s). Parameters of Appendix D1 already verified and checked during vehicle authorisation or other similar processes shall not be reassessed in the framework of route compatibility check.

For vehicle authorised under Directive (EU) 2016/797, the relevant vehicle data related to the parameters listed in Appendix D1, already checked during the authorisation process, being part of:

- the file referred to in Article 21(3) of Directive (EU) 2016/797, and
- the vehicle authorisation as referred to in Article 21(10) of Directive (EU) 2016/797,

shall be provided by the applicant referred to in Article 2(22) of Directive (EU) 2016/797 or the keeper to the railway undertaking upon request, when such information is not available in ERATV or other registers for rail vehicles.

For vehicles authorised before Directive (EU) 2016/797, the relevant vehicle data related to the parameters listed in Appendix D1 shall be provided to the railway undertaking by the holder of the vehicle authorisation documentation or the keeper upon request, when such information is not available in ERATV or other registers for rail vehicles.

The processes for route compatibility in the SMS of the railway undertaking shall include the following checks, which may be performed in parallel at any appropriate time or in any appropriate sequence:

- each vehicle is authorised and registered;
- each vehicle in the train is compatible with the route;
- the composition of the train is compatible with the route and the path;
- the preparation of the train ensuring that the train is correctly formed and complete.

<sup>(6)</sup> Commission Implementing Regulation (EU) 2018/545 of 4 April 2018 establishing practical arrangements for the railway vehicle authorisation and railway vehicle type authorisation process pursuant to Directive (EU) 2016/797 of the European Parliament and of the Council (OJ L 90, 6.4.2018, p. 66).

- (B) The infrastructure manager shall provide the information for route compatibility as defined in Appendix D1 through RINF.

Appendix D1 sets out all the parameters that shall be used in the process of the railway undertaking before the first use of a vehicle or train configuration in order to ensure all vehicles composing a train are compatible with the route(s) the train is planned to operate on including, where appropriate, deviation routes and routes to workshops. Modifications of the route and changes of infrastructure characteristics have to be taken into account. When a parameter of Appendix D1 is harmonised at network(s) level of an area of use, conformity with that parameter may be presumed for any vehicle authorised for that area of use. National rules or additional national requirements for network access in respect of route compatibility are in principle considered incompatible with Appendix D1. The infrastructure manager shall not require additional technical checks for the purpose of route compatibility beyond the list laid down in Appendix D1.

As required by Article 23(1)(b) of Directive (EU) 2016/797, until RINF provides all necessary information in respect of the relevant parameters, the infrastructure manager shall provide this information through other means free of charge as soon as possible and in electronic format to railway undertakings, authorized applicants for path requests and, where applicable, for the applicant referred to in Article 2(22) of Directive (EU) 2016/797.

The first submission of route compatibility information by the infrastructure manager through other mean than RINF shall be delivered at the request of the railway undertaking as soon as reasonably possible and in any event within 15 days unless the infrastructure manager and the railway undertaking agree a longer deadline. The infrastructure manager shall ensure that the information provided to the railway undertaking(s) is complete and accurate.

The infrastructure manager shall inform the railway undertaking of the changes on characteristics of the route through RINF whenever such information becomes available or through other means until RINF allows for such functionality.

For emergency situations or real time information, the infrastructure manager shall ensure immediate information is given to the railway undertaking through appropriate means of communication.

- (C) Additional elements for route compatibility shall be checked when relevant:

- transport of dangerous good as referred in point 4.2.3.4.3,
- quieter route as referred in Noise TSI,
- exceptional transport as referred in Appendix I
- access conditions to underground stations for diesel and other thermal traction systems as referred in clause 4.2.8.3 of LOC&PAS TSI.

#### 4.2.2.5.2. *Train composition*

Train composition requirements shall take into account the following elements according to the allocated path:

- (a) all vehicles composing a train including their loads
- shall be compatible with all the requirements applicable on the routes over which the train shall run;
  - shall be fit to run at the maximum speed at which the train is scheduled to run;
- (b) all vehicles on the train shall remain within their specified maintenance interval for the duration (in terms of both time and distance) of the journey being undertaken;
- (c) the train composed of vehicles including their loads, shall comply with the technical and operational constraints of the route concerned and be within the maximum length permissible for forwarding and receiving terminals.
- (d) the railway undertaking is responsible for ensuring that all vehicles composing the train including their load are technically fit for the journey to be undertaken and remains so throughout the journey.

The railway undertaking may need to consider additional constraints due to the type of braking regime or traction type on a particular train (see point 4.2.2.6).

#### 4.2.2.6. Train braking

##### 4.2.2.6.1. *Minimum requirements of the braking system*

All vehicles in a train shall be connected to the continuous automatic braking system as defined in the LOC&PAS and WAG TSIs.

The first and last vehicles (including any traction units) in any train shall have the automatic brake operative.

In the case of a train becoming accidentally divided into two parts, both sets of detached vehicles shall come automatically to a stand as a result of a maximum application of the brake.

##### 4.2.2.6.2. *Braking performance and maximum speed allowed*

(1) The infrastructure manager shall provide the railway undertaking with all relevant line characteristics for each route through RINF:

- Signalling distances (warning, stopping) containing their inherent safety margins,
- gradients,
- maximum permitted speeds, and
- conditions of use of braking systems possibly affecting the infrastructure such as magnetic, regenerative and eddy-current brake.

Until RINF provides the relevant parameters, the infrastructure manager shall provide this information through other means free of charge and as soon as reasonably possible and in any event within 15 days for the first submission unless the railway undertaking agrees a longer deadline.

The infrastructure manager shall inform the railway undertaking of the changes on the line characteristics through RINF whenever such information becomes available or through other means until RINF allows for such functionality.

The infrastructure manager shall ensure that the information provided to the railway undertaking(s) is complete and accurate.

(2) The infrastructure manager may provide the following information:

- (i) For trains able to run at a maximum speed higher than 200 km/h, deceleration profile and equivalent response time on level track;
- (ii) For trainsets or for fixed train compositions, unable to run at a maximum speed higher than 200 km/h, deceleration (as above in (i)) or brake weight percentage;
- (iii) For other trains (variable compositions of trains unable to run at a maximum speed higher than 200 km/h): brake weight percentage.

If the infrastructure manager provides the above mentioned information, it shall be made available to all railway undertakings who intend to operate trains on its network in a non-discriminatory way.

The braking tables already in use and accepted for the existing non TSI conform lines at the date of entry into force of the present Regulation shall also be made available.

(3) The railway undertaking shall, in the planning stage, determine the braking capability of the train and corresponding maximum speed taking into account:

- the relevant line characteristics as expressed in point (1) above and, if available, the information provided by the infrastructure manager in accordance to point (2) above; and
- the rolling stock-related margins derived from reliability and availability of the braking system.

Furthermore, the railway undertaking shall ensure that during operation each train achieves at least the necessary braking performance. The railway undertaking shall set up and implement corresponding rules and shall manage them within its safety management system.

In particular the railway undertaking has to set up rules to be used if a train does not reach the necessary braking performance during operation. In this case, the railway undertaking shall immediately inform the infrastructure manager. The infrastructure manager may take appropriate measures to reduce the impact on the overall traffic on its network.

#### 4.2.2.7. Ensuring that the train is in running order

##### 4.2.2.7.1. *General requirement*

The railway undertaking shall define the process to ensure that all safety-related on-train equipment is in a fully functional state and that the train is safe to run.

The railway undertaking shall inform the infrastructure manager of any modification to the characteristics of the train affecting its performance or any modification that might affect the ability to accommodate the train in its allocated path.

The infrastructure manager and the railway undertaking shall define and keep up to date conditions and procedures for train running temporarily in degraded mode.

##### 4.2.2.7.2. *Pre-departure data*

The railway undertaking shall ensure that the following data required for safe and efficient operation is made available to the infrastructure manager(s) prior to the departure of the train:

- the train identification
- the identity of the railway undertaking responsible for the train
- the actual length of the train
- if a train carries passengers or animals when it is not scheduled to do so
- any operational restrictions with an indication of the vehicle(s) concerned (gauge, speed restrictions, etc.)
- information the infrastructure manager requires for the transport of dangerous goods.

The railway undertaking shall advise the infrastructure manager(s) if a train does not occupy its allocated path or is cancelled.

#### 4.2.2.8. Requirements for signal and lineside marker sighting

The driver shall be able to observe signals and lineside markers, and they shall be observable by the driver whenever applicable. The same applies for other types of lineside signs if they are safety related.

Therefore, signals, lineside markers, signs and information boards shall be designed and positioned in such a consistent way to facilitate this. Issues that shall be taken into account include:

- that they are suitably sited so that train head lights allow the driver to read the information,
- suitability and intensity of lighting, where required to illuminate the information,
- where retro-reflectivity is employed, the reflective properties of the material used are in compliance with appropriate specifications and the signs are fabricated so that train head lights easily allow the driver to read the information.

Driving cabs shall be designed in such a consistent way that the driver is able to easily see the information displayed to him.

#### 4.2.2.9. Driver vigilance

A means of on-board monitoring of driver vigilance is necessary. This shall intervene to bring the train to a stand if the driver does not react within a certain time; the time range is specified in the rolling stock TSIs.

#### 4.2.3. Specifications relating to train operations

##### 4.2.3.1. Train planning

In accordance with Directive 2012/34/EU, the infrastructure manager shall advise what data is required when a train path is requested.

##### 4.2.3.2. Identification of trains

Each train shall be identified by a train running number. The train running number is given by the infrastructure manager when allocating a train path and shall be known by the railway undertaking and all infrastructure managers operating the train. The train running number shall be unique per network. Changes of train running number during a train journey should be avoided.

##### 4.2.3.2.1. Format of train running number

The train running number format is defined in the control-command and signalling TSI (hereinafter referred to as 'CCS TSI', Commission Regulation (EU) 2016/919 <sup>(7)</sup>)

##### 4.2.3.3. Train departure

##### 4.2.3.3.1. Checks and tests before departure

The railway undertaking shall define the checks and tests to ensure that any departure is undertaken safely (e.g. doors, load, brakes).

##### 4.2.3.3.2. Informing the infrastructure manager of the train's operational status

The railway undertaking shall inform the infrastructure manager when a train is ready for access to the network.

The railway undertaking shall inform the infrastructure manager of any anomaly affecting the train or its operation having possible repercussions on the train's running prior to departure and during the journey.

##### 4.2.3.4. Traffic management

##### 4.2.3.4.1. General requirements

Traffic management shall ensure the safe, efficient and punctual operation of the railway, including effective recovery from service disruption.

The infrastructure manager shall determine procedures and means for:

- the real time management of trains,
- operational measures to maintain the highest possible performance of the infrastructure in case of delays or incidents, whether actual or anticipated, and
- the provision of information to the railway undertaking(s) in such cases.

Any additional processes required by the railway undertaking and which affect the interface with the infrastructure manager(s) may be introduced after being agreed with the infrastructure manager.

<sup>(7)</sup> 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).

#### 4.2.3.4.2. Train reporting

##### 4.2.3.4.2.1. Data required for train position reporting and predicted hand over time

The infrastructure manager shall:

- (a) provide a means of real time recording of the times at which trains depart from, arrive at or pass appropriate pre-defined reporting points on their networks and the delta-time value;
- (b) have a process which enables an indication of the estimated number of minutes of deviation from the scheduled time a train is scheduled to be handed over from one infrastructure manager to another; this shall include information on service disruption (description and location of problem).
- (c) provide the specific data according to Commission Regulation (EU) No 1305/2014 <sup>(8)</sup> (Telematics Applications for Freight — TAF TSI) and Commission Regulation (EU) No 454/2011 <sup>(9)</sup> (Telematics Applications for Passengers — TAP TSI) required in relation to train position reporting. Such information shall include:
  - (1) Train identification
  - (2) Identity of reporting point
  - (3) Line on which the train is running
  - (4) Scheduled time at reporting point
  - (5) Actual time at reporting point (and whether depart, arrive or pass — separate arrival and departure times shall be provided in respect of intermediate reporting points at which the train calls)
  - (6) Number of minutes early or late at the reporting point
  - (7) Initial explanation of any single delay exceeding 10 minutes or as otherwise required by the performance monitoring regime
  - (8) Indication that a report for a train is overdue and the number of minutes by which it is overdue
  - (9) Former train identification(s), if any
  - (10) Train cancelled for a whole or a part of its journey.

##### 4.2.3.4.3. Dangerous goods

The railway undertaking shall define the procedures to perform the transport of dangerous goods.

These procedures shall include:

- the provisions as specified in Directive 2008/68/EC of the European Parliament and of the Council <sup>(10)</sup> and Directive 2010/35/EU of the European Parliament and of the Council <sup>(11)</sup>, as applicable
- inform to the driver of the presence and position of dangerous goods on the train
- information the infrastructure manager requires for transport of dangerous goods
- determination, in conjunction with the infrastructure manager, of lines of communication and planning of specific measures in case of emergency situations involving the goods.

<sup>(8)</sup> Commission Regulation (EU) No 1305/2014 of 11 December 2014 on the technical specification for interoperability relating to the telematics applications for freight subsystem of the rail system in the European Union and repealing the Regulation (EC) No 62/2006 (OJ L 356, 12.12.2014, p. 438).

<sup>(9)</sup> Commission Regulation (EU) No 454/2011 of 5 May 2011 on the technical specification for interoperability relating to the subsystem 'telematics applications for passenger services' of the trans-European rail system (OJ L 123, 12.5.2011, p. 11).

<sup>(10)</sup> Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods (OJ L 260, 30.9.2008, p. 13).

<sup>(11)</sup> Directive 2010/35/EU of the European Parliament and of the Council of 16 June 2010 on transportable pressure equipment and repealing Council Directives 76/767/EEC, 84/525/EEC, 84/526/EEC, 84/527/EEC and 1999/36/EC (OJ L 165, 30.6.2010, p. 1).

#### 4.2.3.4.4. *Operational quality*

The infrastructure manager and the railway undertaking shall have processes in place to monitor the efficient operation of all the services concerned.

Monitoring processes shall be designed to analyse data and detect underlying trends, both in terms of human error and system error. The results of this analysis shall be used to generate improvement actions, designed to eliminate or mitigate against events which could compromise the efficient operation of the network.

Where such improvement actions would have network-wide benefits, involving other infrastructure managers and railway undertakings, they shall, subject to commercial confidentiality, be communicated accordingly.

Events that have significantly disrupted operations shall be analysed as soon as possible by the infrastructure manager. Where appropriate, and in particular where one of their staff is concerned, the infrastructure manager shall invite those railway undertaking(s) involved in the event concerned to participate in the analysis. Where the result of such analysis leads to network improvement recommendations designed to eliminate or mitigate against causes of accidents/incidents, these shall be communicated to all relevant infrastructure managers and railway undertakings concerned.

These processes shall be documented and subject to internal audit.

#### 4.2.3.5. *Data recording*

Data pertaining to the running of a train shall be recorded and retained for the purposes of:

- Supporting systematic safety monitoring as a means of preventing incidents and accidents.
- Identification of driver, train and infrastructure performance in the period leading up to and, if appropriate, immediately after an incident or accident, in order to enable the identification of causes, and supporting the case for new or changed measures to prevent recurrence.
- Recording information relating to the performance of both the locomotive/traction unit and the person driving.

It shall be possible to match recorded data to:

- the date and time of the recording;
- the precise geographic location of the event being recorded;
- the train identification;
- the identity of the driver.

Data to be recorded for ETCS/GSM-R are those defined in the TSI CCS and that are relevant considering the requirements in this point 4.2.3.5.

The data shall be securely sealed and stored and accessible to authorised bodies including Investigating Bodies in carrying out their role pursuant to Article 22 of Directive (EU) 2016/798.

##### 4.2.3.5.1. *Recording of supervision data outside the train*

As a minimum, the infrastructure manager shall record the following data:

- the failure of lineside equipment associated with the movement of trains (signalling, points etc.);
- the detection of an overheating axle bearing, if fitted;
- safety related communication between the train driver and signaller.

##### 4.2.3.5.2. *Recording of supervision data on-board the train*

As a minimum, the railway undertaking shall record the following data:

- the detection of passing of signals at danger or 'end of movement authority';
- application of the emergency brake;

- speed at which the train is running;
- any isolation or overriding of the on-board train control (signalling) systems;
- operation of the audible warning device;
- operation of door controls (release, closure), if fitted;
- detection by on-board alarm systems related to the safe operation of the train, if fitted;
- identity of the cab for which data is being recorded to be checked.

Further technical specifications concerning the recording device are set out in the LOC&PAS TSI.

#### 4.2.3.6. Degraded operation

##### 4.2.3.6.1. *Advice to other users*

The infrastructure manager in conjunction with the railway undertaking(s) shall define a process to immediately inform each other of any situation that impedes the safety, performance and/or the availability of the rail network or rolling stock.

##### 4.2.3.6.2. *Advice to train drivers*

In any case of degraded operation associated with the infrastructure manager's area of responsibility, the infrastructure manager shall give formal instructions to drivers on what measures to take in order to safely overcome the degradation.

##### 4.2.3.6.3. *Contingency arrangements*

The infrastructure manager in conjunction with all the railway undertakings operating over its infrastructure, and neighbouring infrastructure managers as appropriate, shall define, publish and make available appropriate contingency measures and assign responsibilities based on the requirement to reduce any negative impact as a result of degraded operation.

The planning requirements and the response to such events shall be proportional to the nature and potential severity of the degradation.

These measures, which shall as a minimum include plans for recovering the network to 'normal' status, may also address:

- rolling stock failures (for example, those which could result in substantial traffic disruption, the procedures for rescuing failed trains);
- infrastructure failures (for example, when there has been a failure of the electric power or the conditions under which trains may be diverted from the booked route);
- extreme weather conditions.

The infrastructure manager shall establish and keep updated contact information for key infrastructure manager and railway undertaking staff who may be contacted in the event of service disruption leading to degraded operation. This information shall include contact details both during and outside office hours.

The railway undertaking shall submit this information to the infrastructure manager and advise the infrastructure manager of any changes to these contact details.

The infrastructure manager shall advise all the railway undertaking(s) of any changes to its details.

##### 4.2.3.7. Managing an emergency situation

The infrastructure manager shall, in consultation with:

- all railway undertakings operating over its infrastructure, or, where appropriate, representative bodies of railway undertakings operating over its infrastructure,
- neighbouring infrastructure managers, as appropriate,



- local authorities, representative bodies of the emergency services (including fire-fighting and rescue) at either local or national level, as appropriate,

define, publish and make available appropriate measures to manage emergency situations and restore the line to normal operation.

Such measures shall typically cover:

- collisions,
- fires on train,
- evacuation of trains,
- accidents in tunnels,
- incidents involving dangerous goods
- derailments.

The railway undertaking shall provide the infrastructure manager with any specific information in respect to these circumstances, especially in respect to the recovery or re-railing of their trains.

Additionally, the railway undertaking shall have processes to inform passengers about on-board emergency and safety procedures.

#### 4.2.3.8. Aid to train crew in the event of an incident or of a major rolling stock malfunction

The railway undertaking shall define appropriate procedures to assist the train crew in degraded situations in order to avoid or decrease delays caused by technical or other failures of the rolling stock (for example, lines of communication, measures to be taken in case of evacuation of a train).

### 4.3. Functional and technical specifications of the interfaces

In the light of the essential requirements set out in Chapter 3 of this Regulation, the functional and technical specifications of the interfaces are as follows:

#### 4.3.1. Interfaces with the infrastructure TSI (INF TSI)

Reference this Regulation		Reference INF TSI	
Parameter	Point	Parameter	Point
Braking performance and maximum speed allowed	4.2.2.6.2	Longitudinal track resistance	4.2.6.2
Modifications to information contained within the route book	4.2.1.2.2.2	Operating rules	4.4
Degraded operation	4.2.3.6		
Parameters for the vehicle and train compatibility over the route intended for operation	Appendix D1	Ascertain Compatibility of infrastructure and rolling stock after authorisation of rolling stock	7.6

4.3.2. *Interfaces with the control-command and signalling TSI (CCS TSI)*

Reference this Regulation		Reference CCS TSI	
Parameter	Point	Parameter	Point
Driver's Rule Book Operating rules	4.2.1.2.1 4.4	Operating rules (normal and de-graded conditions)	4.4
Requirements for lineside signal and marker sighting	4.2.2.8	Visibility of track-side control-command and signalling objects	4.2.15
Train braking	4.2.2.6	Train braking performance and characteristics	4.2.2
Driver's Rule Book	4.2.1.2.1	Use of sanding equipment On-board flange lubrication Use of composite brake blocks	4.2.10
Format of train running number	4.2.3.2.1	ETCS DMI GSM-R DMI	4.2.12 4.2.13
Data recording	4.2.3.5	Interface to data recording for regulatory purposes	4.2.14
Ensuring that the train is in running order	4.2.2.7	Key management	4.2.8
Parameters for the vehicle and train compatibility over the route intended for operation	Appendix D1	Route compatibility checks before the use of authorised vehicles	4.9

4.3.3. *Interfaces with the rolling stock TSIs*4.3.3.1. *Interfaces with the locomotives and passenger rolling stock TSI (LOC&PAS TSI)*

Reference this Regulation		Reference LOC&PAS TSI	
Parameter	Point	Parameter	Point
Contingency arrangements	4.2.3.6.3	Rescue coupling	4.2.2.2.4
		End coupling	4.2.2.2.3
Route Compatibility and Train composition	4.2.2.5	axle load parameter	4.2.3.2.1
Train braking	4.2.2.6	Braking performance	4.2.4.5.
Train visibility	4.2.2.1	External lights	4.2.7.1
Train audibility	4.2.2.2	Horn (audible warning device)	4.2.7.2
Requirements for lineside signal and marker sighting	4.2.2.8	External visibility	4.2.9.1.3
		Optical characteristics of the wind-screen	4.2.9.2.2
		Internal lighting	4.2.9.1.8

Reference this Regulation		Reference LOC&PAS TSI	
Parameter	Point	Parameter	Point
Driver vigilance	4.2.2.9	Driver's activity control function	4.2.9.3.1
Recording of supervision data on-board the train	4.2.3.5.2	Recording device	4.2.9.6
Managing an emergency situation	4.2.3.7	Lifting diagram and instructions	4.2.12.5
		Rescue related descriptions	4.2.12.6
Route Compatibility and Train composition	4.2.2.5	Operating documentation	4.2.12.4
Minimum elements relevant to professional qualification for the tasks associated with 'accompanying trains'	Appendix F		
Sanding	Appendix B	Rolling stock characteristics for compatibility with train detection system based on track circuits — Isolating emissions	4.2.3.3.1.1
Parameters for the vehicle and train compatibility over the route intended for operation	Appendix D1	Route compatibility checks before the use of authorised vehicles	4.9

#### 4.3.3.2. Interfaces with the freight wagons TSI (WAG TSI)

Reference this Regulation		Reference WAG TSI	
Parameter	Point	Parameter	Point
Rear end	4.2.2.1.3	Attachment devices for rear-end signal	4.2.6.3
Freight trains	4.2.2.1.3.2	Rear-end signal	Appendix E
Route Compatibility and Train composition	4.2.2.5	Gauging	4.2.3.1
Route Compatibility and Train composition	4.2.2.5	Compatibility with load carrying capacity of lines	4.2.3.2
Contingency arrangements	4.2.3.6.3	Strength of unit — Lifting and jacking	4.2.2.2
Train braking	4.2.2.6	Brake	4.2.4
Parameters for the vehicle and train compatibility over the route intended for operation	Appendix D1	Route compatibility checks before the use of authorised vehicles	4.9

4.3.4. *Interfaces with the Energy TSI (ENE TSI)*

Reference this Regulation		Reference ENE TSI	
Parameter	Point	Parameter	Point
Route Compatibility and Train composition	4.2.2.5	Maximum train current	4.2.4.1
Preparation of the Route Book	4.2.1.2.2.1		
Route Compatibility and Train composition	4.2.2.5	Separation sections:	
Preparation of the Route Book	4.2.1.2.2.1	Phase	4.2.15
		System	4.2.16
Parameters for the vehicle and train compatibility over the route intended for operation	Appendix D1	Route compatibility checks before the use of authorised vehicles	7.3.5

4.3.5. *Interfaces with the Safety in Railway Tunnels TSI (SRT TSI)*

Reference this Regulation		Reference SRT TSI	
Parameter	Point	Parameter	Point
Ensuring that the train is in running order	4.2.2.7	Emergency rule	4.4.1
Train departure	4.2.3.3		
Degraded operation	4.2.3.6		
Managing an emergency situation	4.2.3.7	Tunnels emergency plan	4.4.2
		Exercises	4.4.3
		Provision of on-train safety and emergency information to passengers	4.4.5
Professional competence	4.6.1	Tunnel specific competence of the train crew and other staff	4.6.1

4.3.6. *Interfaces with the Noise TSI (NOI TSI)*

Reference this Regulation		Reference NOI TSI	
Parameter	Point	Parameter	Point
Route compatibility and train composition	4.2.2.5	Additional provisions for the application of this TSI to existing wagons	7.2.2
Train planning	4.2.3.1	Quieter routes	Appendix D
Contingency arrangements	4.2.3.6.3	Specific rules for the operation of wagons on quieter routes in case of degraded operation	4.4.1

4.3.7. *Interfaces with the Regulation (EU) No 1300/2014 <sup>(12)</sup>, Person with Reduced Mobility TSI (PRM TSI)*

Reference this Regulation		Reference PRM TSI	
Parameter	Point	Parameter	Point
Professional Competence Minimum elements relevant to professional qualification for the tasks associated with 'accompanying trains'	4.6.1 Appendix F	Infrastructure subsystem	4.4.1
Professional Competence Minimum elements relevant to professional qualification for the tasks associated with 'accompanying trains'	4.6.1 Appendix F	Rolling stock subsystem	4.4.2
Route Compatibility and Train composition	4.2.2.5	Rolling stock subsystem	4.4.2

4.4. **Operating rules**4.4.1. *European Union railway system operational principles and rules*

Operational principles and rules to be applied throughout the European Union railway system are specified in Appendices A (ERTMS operational principles and rules) and B (common operational principles and rules).

4.4.2. *National rules*

National rules are not compatible with this TSI, except for Appendix I which lists the areas where no common operational principles and rules exist and which may continue to be subject to national rules. In accordance with Decision (EU) 2017/1474 the Agency in cooperation with the Member State(s) concerned shall cooperate to assess the list of open points with a view to:

- (a) further harmonise the requirements of this Regulation through detailed provisions or through acceptable means of compliance, or
- (b) facilitate the integration of such national rules into the safety management systems of the railway undertakings and the infrastructure managers, or
- (c) confirm the need for national rules.

4.4.3. *Acceptable Means of Compliance*

The Agency may by means of technical opinion define acceptable means of compliance, which shall be presumed to ensure compliance with specific requirements of this Regulation, and ensure safety in accordance with Directive (EU) 2016/798.

The Commission, the Member States or the affected stakeholders may request the Agency to define acceptable means of compliance in accordance with Article 10 of Regulation (EU) 2016/796 of the European Parliament and of the Council of 11 May 2016 <sup>(13)</sup>. The Agency shall consult Member States and affected stakeholders and present the technical opinion to the committee referred to in Article 51 of Directive (EU) 2016/797 before its adoption.

At the latest by 16 June 2021 the Agency shall deliver technical opinions defining acceptable means of compliance covering at least each of the following areas:

- Safety of load (see 4.2.2.4.1);
- Safety of passengers (see 4.2.2.4.2);

<sup>(12)</sup> Commission Regulation (EU) No 1300/2014 of 18 November 2014 on the technical specifications for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility (OJ L 356, 12.12.2014, p. 110).

<sup>(13)</sup> 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 881/2004 (OJ L 138, 26.5.2016, p. 1).

- Checks and tests before departure, including brakes and checks during operation (see 4.2.3.3.1)
- Train departure (see 4.2.3.3)
- Degraded operations (see 4.2.3.6).

Before 15 October 2019, if Member States and affected stakeholders believe a specific national rule shall be considered in the context of defining an acceptable means of compliance in the above areas, they shall notify details thereof to the Agency which shall proceed in line with the procedures referred to in point 4.4.3.

#### 4.4.4. *Transition from application of national rules to implementation of this Regulation*

During the transition from the application of national rules to the implementation of this Regulation, railway undertakings and infrastructure managers shall review their safety management systems to ensure the continuation of safe operations. If necessary, they shall update their safety management systems.

In situation of deficiency, the procedure of Article 6 of Directive (EU) 2016/797 shall apply.

#### 4.5. **Maintenance rules**

Not applicable

#### 4.6. **Professional competences**

##### 4.6.1. *Professional competence*

Staff of the railway undertaking and the infrastructure manager shall have attained appropriate professional competence to undertake all necessary safety-critical tasks in normal, degraded and emergency situations. Such competence comprises professional knowledge and the ability to put this knowledge into practice.

Minimum elements relevant to professional qualification for individual tasks may be found in Appendices F and G.

##### 4.6.2. *Language competence*

###### 4.6.2.1. Principles

The infrastructure manager and the railway undertaking are required to ensure that their relevant staff are competent in the use of the communication protocols and principles set out in Appendix C.

Where the operating language used by the infrastructure manager differs from that habitually used by the railway undertaking's staff, such linguistic and communications training shall form a critical part of the railway undertaking's overall competence management system.

Railway undertaking staff whose duties require them to communicate with staff of the infrastructure manager in connection with safety-critical matters, whether in normal, degraded or emergency situations, shall have a sufficient level of knowledge in the operating language of the infrastructure manager.

###### 4.6.2.2. Level of knowledge

The level of knowledge in the infrastructure manager's operating language shall be sufficient for safety purposes.

(a) As a minimum this shall comprise of the driver being able to:

- send and understand all the messages specified in Appendix C;
- effectively communicate in normal, degraded and emergency situations;
- complete the forms associated with the use of the Book of Forms;

- (b) Other members of the train crew whose duties require them to communicate with the infrastructure manager on safety-critical matters, shall as a minimum, be able to send and understand information describing the train and its operational status.

The level of knowledge for staff accompanying trains other than train drivers shall be at least level 2 as described in Appendix E.

#### 4.6.3. *Initial and ongoing assessment of staff*

##### 4.6.3.1. Basic elements

Railway undertakings and infrastructure managers are required to define the assessment process for their staff in order to meet the requirements specified in Commission Delegated Regulation (EU) 2018/762 <sup>(14)</sup> or Commission Regulations (EU) No 1158/2010 <sup>(15)</sup> and (EU) No 1169/2010 <sup>(16)</sup>.

##### 4.6.3.2. Analysis and update of training needs

Railway undertakings and infrastructure managers shall undertake an analysis of training needs for their relevant staff and define a process for reviewing and updating their individual training needs in order to meet the requirements specified in Delegated Regulation (EU) 2018/762 or Regulations (EU) No 1158/2010 and (EU) No 1169/2010.

This analysis shall set out both scope and complexity and take into account the risks associated with the operation of trains, traction and rolling stock. The railway undertaking shall define the process by which knowledge of on board staff of the routes worked over is acquired and maintained. This process shall be:

- based upon the route information provided by the infrastructure manager; and
- in accordance with the process described in point 4.2.1.

For the tasks associated with ‘accompanying trains’ and ‘preparing trains’, the elements that shall be considered may be found in respectively the appendices F and G. As appropriate, these elements shall be put in place as part of the training for staff.

It is possible that due to the type of operation envisaged by a railway undertaking or the nature of the network being run by an infrastructure manager, some of the elements in the appendices F and G shall not be appropriate. The analysis of training needs shall document those not deemed appropriate and the reasons why.

##### 4.6.4. *Auxiliary staff*

The railway undertaking shall make sure that the auxiliary staff (for example, catering and cleaning) not forming part of the train crew is, in addition to their basic instruction, trained to respond to the instructions of the fully trained members of the train crew.

#### 4.7. **Health and safety conditions**

##### 4.7.1. *Introduction*

Staff specified in point 4.2.1 as staff performing safety-critical tasks in accordance with point 2.1 shall have appropriate fitness to ensure that overall operational and safety standards are met.

Railway undertakings and infrastructure managers shall set up and document the process they put in place to meet the medical, psychological and health requirements for their staff within their safety management system.

<sup>(14)</sup> Commission Delegated Regulation (EU) 2018/762 of 8 March 2018 establishing common safety methods on safety management system requirements pursuant to Directive (EU) 2016/798 of the European Parliament and of the Council and repealing Commission Regulations (EU) No 1158/2010 and (EU) No 1169/2010 (OJ L 129, 25.5.2018, p. 26).

<sup>(15)</sup> Commission Regulation (EU) No 1158/2010 of 9 December 2010 on a common safety method for assessing conformity with the requirements for obtaining railway safety certificates (OJ L 326, 10.12.2010, p. 11).

<sup>(16)</sup> Commission Regulation (EU) No 1169/2010 of 10 December 2010 on a common safety method for assessing conformity with the requirements for obtaining a railway safety authorization (OJ L 327, 11.12.2010, p. 13).

Medical examinations as specified in point 4.7.2 and any associated decisions on the individual fitness of staff shall be conducted by a medical doctor.

Staff shall not perform safety-critical tasks whilst vigilance is impaired by substances such as alcohol, drugs or psychotropic medication. Therefore, the railway undertaking and the infrastructure manager shall have in place procedures to control the risk that staff attend for work under the influence of such substances, or consume such substances at work.

National rules of the Member State where a train service is operated apply with regard to defined limits of the above mentioned substances.

#### 4.7.2. *Medical examinations and psychological assessments*

##### 4.7.2.1. Before appointment

##### 4.7.2.1.1. *Minimum content of the medical examination*

Medical examinations shall cover:

- General medical examination;
- Examinations of sensory functions (vision, hearing, colour perception);
- Urine or blood analysis for the detection of diabetes mellitus and other conditions as indicated by the clinical examination;
- Screening for abuse of drugs.

##### 4.7.2.1.2. *Psychological assessment*

The aim of the psychological assessment is to support the railway undertaking in the appointment and management of staff who have the cognitive, psychomotor, behavioural and personality capabilities to perform their roles safely.

In determining the content of the psychological assessment, as a minimum, the following criteria relevant to the requirements of each safety function shall be taken into account:

(a) Cognitive:

- Attention and concentration,
- Memory,
- Perceptive capability,
- Reasoning,
- Communication.

(b) Psychomotor:

- Speed of reaction,
- Gestured coordination.

(c) Behavioural and personality

- Emotional self-control,
- Behavioural reliability,
- Autonomy,
- Conscientiousness.

If any of those elements is omitted, the respective decision shall be justified and documented by a psychologist.

Applicants shall demonstrate their psychological fitness by passing an examination conducted by, or under the supervision of — to be decided by the Member State — a psychologist or a medical doctor.



#### 4.7.2.2. After appointment

##### 4.7.2.2.1. *Frequency of periodic medical examinations*

At least one systematic medical examination shall be performed:

- Every 5 years for staff aged up to 40;
- Every 3 years for staff aged between 41 and 62;
- Every year for staff aged over 62.

Increased frequency of examination shall be set by the medical doctor if the state of health of the member of the staff requires so.

##### 4.7.2.2.2. *Minimum content of the periodic medical examination*

If the worker complies with the criteria required at the examination, which is carried out before practising an occupation, the periodic specialised examinations shall include as a minimum:

- General medical examination;
- Examination of sensory functions (vision, hearing, colour perception);
- Urine or blood analysis for the detection of diabetes mellitus and other conditions as indicated by the clinical examination;
- Screening for abuse of drugs where clinically indicated.

##### 4.7.2.2.3. *Additional medical examinations and/or psychological assessments*

Besides the periodic medical examination, an additional specific medical examination and/or psychological assessment shall be performed where there is reasonable ground for doubting the medical or psychological fitness of a member of staff or reasonable suspicion of use of drugs or use of alcohol over the limits allowed. This would be the case especially after an incident or accident caused by human error on the part of the individual.

The railway undertaking and the infrastructure manager shall put systems in place to ensure that such additional examinations and assessments are undertaken as appropriate.

#### 4.7.3. *Medical requirements*

##### 4.7.3.1. *General requirements*

Staff shall not suffer from medical conditions or take medical treatment likely to cause:

- Sudden loss of consciousness;
- Impairment of awareness or concentration;
- Sudden incapacity;
- Impairment of balance or coordination;
- Significant limitation of mobility.

The following vision and hearing requirements shall be met:

##### 4.7.3.2. *Vision requirements*

- Aided or unaided distance visual acuity: 0,8 (right eye + left eye — measured separately); minimum of 0,3 for the worse eye;
- Maximum corrective lenses: hypermetropia + 5/myopia – 8. The medical doctor may allow values outside this range in exceptional cases and after having sought the opinion of an eye specialist;
- Intermediate and near vision: sufficient whether aided or unaided;
- Contact lenses are allowed;
- Normal colour vision: using a recognised test, such as the Ishihara, completed by another recognised test if required;

- Vision field: normal (absence of any abnormality affecting the task to be performed);
- Vision for both eyes: effective;
- Binocular vision: effective;
- Contrast sensitivity: good;
- Absence of progressive eye disease;
- Lens implants, keratotomies and keratectomies are allowed only on condition that they are checked on a yearly basis or according to a frequency set by the medical doctor.

#### 4.7.3.3. Hearing requirements

Sufficient hearing confirmed with tone audiogram, that is:

- Hearing good enough to hold a phone conversation going and be able to hear alert tones and radio messages
- The use of hearing aids is allowed.

### 4.8. Additional information on infrastructure and vehicles

#### 4.8.1. Infrastructure

The requirements for the rail infrastructure related data items with regard to the operation and traffic management subsystem, and which shall be made available to railway undertakings through RINF, are specified in Appendix D.

Until RINF is complete, the infrastructure manager shall provide this information through other means free of charge and as soon as reasonably possible and in any event within 15 days for the first submission unless the railway undertaking agrees a longer deadline.

The infrastructure manager shall inform the railway undertaking of the changes on the infrastructure related data through RINF whenever such information becomes available or through other means until RINF allows for such functionality. The infrastructure manager is responsible for the correctness of the data.

For emergency situations or real time information appropriate alternative means of communication of the infrastructure manager shall ensure immediate information to the railway undertaking.

#### 4.8.2. Rolling stock

The following rolling stock related data items shall be available to infrastructure managers:

- whether the vehicle is constructed from materials which may be hazardous in case of accidents or fire (for example, asbestos); the keeper is responsible for the correctness of the data;
- total length of the vehicle, including buffers if existing; the railway undertaking is responsible for the correctness of the data.

### 5. INTEROPERABILITY CONSTITUENTS

#### 5.1. Definition

Article 2.7 of Directive (EU) 2016/797 defines the 'interoperability constituents'.

#### 5.2. List of constituents

In respect to the operation and traffic management subsystem, there is no interoperability constituent.

### 6. ASSESSMENT OF CONFORMITY AND/OR SUITABILITY FOR USE OF THE CONSTITUENTS AND VERIFICATION OF THE SUBSYSTEM

#### 6.1. Interoperability constituents

As this Regulation does not yet specify any interoperability constituents, no assessment arrangements are discussed.

## 6.2. Operation and traffic management subsystem

### 6.2.1. Principles

The operation and traffic management subsystem is a functional subsystem according to Annex II to Directive (EU) 2016/797.

In accordance with Articles 9 and 10 of Directive (EU) 2016/798, railway undertakings and infrastructure managers shall demonstrate compliance with the requirements of this Regulation within their safety management system when applying for any new or amended safety certificate or safety authorisation.

The common safety methods on conformity assessment and the common safety methods on safety management system require national safety authorities to set up an inspection regime to supervise and monitor the compliance with the safety management system including all TSIs. It should be noted that none of the elements contained within this Regulation require separate assessment by a Notified Body.

Requirements in this Regulation that refer to structural subsystems and listed in the interfaces (point 4.3) are assessed under the relevant structural TSIs.

## 7. IMPLEMENTATION

### 7.1. Principles

In accordance with Article 9 of Directive (EU) 2016/798, railway undertakings and infrastructure managers shall ensure compliance with this Regulation under their SMS.

### 7.2. Specific cases

#### 7.2.1. Introduction

The following special provisions are permitted in the specific cases below.

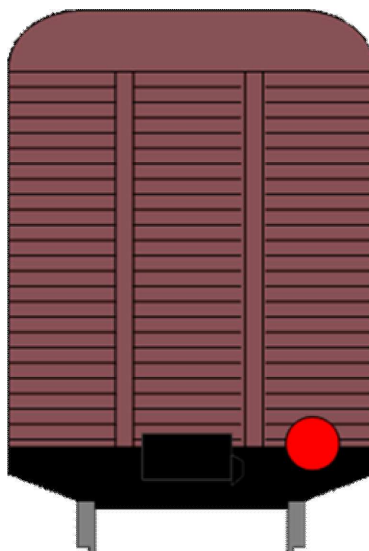
These specific cases belong to two categories:

- (a) the provisions apply either permanently (case 'P'), or temporarily (case 'T').
- (b) In temporary cases Member States shall conform with the relevant subsystem by 2024 (case 'T1').

#### 7.2.2. List of specific cases

##### 7.2.2.1. Permanent specific case (P) Estonia, Latvia, Lithuania, Poland, Hungary and Slovakia

For the implementation of point 4.2.2.1.3.2, trains which are operated solely on the 1 520 mm gauge network of Estonia, Latvia, Lithuania, Poland, Hungary and Slovakia may use the following train rear end signal.



The reflective disc shall have a diameter of 185 mm with a red circle diameter of 140 mm.

7.2.2.2. Permanent specific case Ireland and the UK for Northern Ireland

For the implementation of point 4.2.2.1.3.2, trains which are operated solely on the 1 600 mm track gauge system network of Ireland and Northern Ireland shall use 2 steady red lights as train rear end signal.

7.2.2.3. Temporary specific case (T1) Ireland and United Kingdom

For the implementation of point 4.2.3.2.1, Ireland and United Kingdom are using alphanumeric number in the existing systems. The MS set out the requirements and time schedule for the transition from alphanumeric train running numbers to numeric train running numbers in the target system.

7.2.2.4. Permanent specific case (P) Finland

For the implementation of point 4.2.2.1.3.2 and the implementation of common operational rule 5 of Appendix B, Finland is not using any rear end signal device for freight trains. The means to indicate the train rear end signal for freight trains as stated in point 4.2.2.1.3.2 are also accepted in Finland.

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*Appendix A***ERTMS operational principles and rules**

The operational rules for ERTMS/ETCS and ERTMS/GSM-R are specified in the Document 'ERTMS operational principles and rules — version 5' issued on 9.4.2019 <sup>(1)</sup>.

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<sup>(1)</sup> Published on the ERA website ([www.era.europa.eu](http://www.era.europa.eu)).

*Appendix B***Common operational principles and rules****B1. Fundamental operational principles**

1. The method of authorising a train movement shall maintain a safe interval between trains.
2. A train shall only operate over a portion of line if the train composition is compatible with the infrastructure.
3. Before a train begins or continues its journey, it shall be ensured that passengers, staff and goods are carried safely.
4. Before a train is allowed to start or continue its movement, it shall have an authority to move and all necessary information to define the conditions of that authority.
5. A train shall be prevented from proceeding onto a portion of line if it is known or suspected that it would not be safe for the train to pass until measures have been taken to allow the train to continue safely.
6. A train shall not continue to operate after it has been found to be unsafe in any respect, until measures have been taken to allow the train to continue safely.

**B2. Common operational rules**

In case of degraded operation, the contingency arrangements set out in point 4.2.3.6.3 shall also be considered.

**1. SANDING**

If the train is equipped with manually activated sanding equipment, the driver shall always be allowed to apply sand but shall avoid it wherever possible:

- in the area of points and crossings,
- during braking at speeds less than 20 km/h,
- when at standstill.

The exceptions to this are:

- if there is a risk of SPAD (Signal Passed At Danger), or other serious incident and the application of sand would assist adhesion,
- when starting away,
- when required to test the sanding equipment on the traction unit.

**2. DEPARTURE OF THE TRAIN**

At the initial station or after a scheduled stop the driver is allowed to depart when the following conditions are fulfilled:

- after the driver has received an authorisation for train movement;
- after train service conditions are fulfilled;
- when it is time to depart, except when allowed to start before the scheduled time.

**3. NO AUTHORISATION FOR TRAIN MOVEMENT AT THE EXPECTED TIME**

If the driver has not received an authorisation for train movement at the expected time, and has no information as to the reason, the driver shall inform the signaller.

#### 4. COMPLETE FAILURE OF FRONT END LIGHTS

If the driver is not able to display any front end light:

##### 4.1. **During good visibility**

The driver shall inform the signaller about the failure. The train shall proceed at the maximum permitted speed to the nearest location where the front end light may be repaired/replaced or the affected vehicle replaced. When proceeding, the driver shall use the train audible warning device as necessary or as instructed by the signaller.

##### 4.2. **During darkness or poor visibility**

The driver shall inform the signaller about the failure. As long as a portable front end light displaying a white light is fitted on the front of the train, the train shall proceed at the maximum allowable speed for that failure to the nearest location where the front end light may be repaired/replaced or the affected vehicle replaced.

If a portable front end light is not available, the train shall not proceed, unless formal instructions are given by the signaller to continue to the nearest suitable location to where the line may be cleared.

When proceeding, the driver shall use the train audible warning device as necessary or as instructed by the signaller.

#### 5. COMPLETE FAILURE OF A REAR END SIGNAL

- (1) If the signaller becomes aware of the complete failure of the train rear end signal, the signaller shall make arrangements to stop the train in an appropriate location and inform the driver.
- (2) The driver shall then check the completeness of the train and if necessary repair/replace the train rear end signal.
- (3) The driver shall report to the signaller that the train is ready to proceed. Otherwise, if the repair is not possible, the train may not proceed, unless special arrangements are made between signaller and driver.

#### 6. FAILURE OF THE AUDIBLE WARNING DEVICE OF A TRAIN

If the audible warning device fails, the driver shall inform the signaller about the failure. The train shall not exceed the permitted speed in the event of the failure of an audible warning device, and shall proceed to the nearest location where the audible warning device may be repaired or the affected vehicle replaced. The driver shall be prepared to stop before passing over any level crossing where the audible warning device is required to be sounded and then proceed over the level crossing only when it is safe to do so. If a multi-tone audible warning device is defective but at least one tone is functioning, the train may proceed normally.

#### 7. FAILURE OF LEVEL CROSSING

##### 7.1. **Stopping trains passing over a defective level crossing**

When a technical failure affecting safety of running trains over a level crossing has been detected and as long as the safe operation has not been restored, the normal passing of trains over the level crossing shall be prevented.

##### 7.2. **Passing trains over the defective level crossing (if authorised)**

- (1) Where the nature of the failure permits train movements to continue, the driver of each train shall be authorised to continue and to pass over the level crossing.
- (2) After being instructed to pass over the level crossing with a failure, the driver shall pass the level crossing as instructed. If the level crossing becomes obstructed the driver shall take all possible measures necessary to stop.
- (3) When approaching the level crossing, the driver shall use the audible warning device when necessary or when formal instructions have been given by the signaller. If the level crossing is clear, the driver shall proceed and accelerate the train as soon as the front of the train has passed clear the level crossing.

## 8. FAILURE OF VOICE RADIO COMMUNICATION

### 8.1. Failure of train radio detected during train preparation

In case of on board radio failure a train shall not be permitted to start a service on lines where a radio is required.

### 8.2. Failure of voice radio communication when the train has entered service

All failure types

If the driver becomes aware that the primary voice radio communication is failed, the driver shall inform the signaller as soon as practicable using any available means.

The driver shall then apply the instructions by the signaller concerning the further movement of the train.

On-board Failure

A train with a failed voice radio communication may:

- continue its service if another means of communication is provided between the train driver and the signaller;  
or
- proceed to the nearest location where the radio may be repaired or the affected vehicle replaced if another means of voice communication is not provided between the driver and the signaller.

## 9. RUNNING ON SIGHT

When a driver has to run on sight, the driver shall:

- Proceed with caution, controlling the speed having regard to the visibility of the line ahead, so that it is possible within the free visible part to stop short of any vehicle, stop aspect or obstacle on the infrastructure; and
- Not exceed the maximum speed for running on sight.

This does not apply to unexpected obstacle entering the track zone within the stopping distance.

## 10. ASSISTANCE TO A FAILED TRAIN

(1) If a train is stopped by failure, the driver shall immediately inform the signaller about the failure and the circumstances of the failure.

(2) When an assisting train is needed, the driver and signaller shall agree at least all of the following:

- the type of assisting train needed
- if a specific direction is required (front or rear)
- the location of the failed train.

After the driver has asked for assistance, the train shall not be moved even if the defect is rectified until:

- the assisting train has arrived, or
- the driver and signaller have agreed alternative arrangements.

(3) The signaller shall not allow the assisting train to enter the section occupied by the failed train unless confirmation has been received that the failed train shall not be moved.

When the assisting train is ready to enter the section occupied by the failed train, the signaller shall inform the driver of the assisting train at least the following:

- the location of the failed train
- the location where the failed train is to be taken to



- (4) The driver of the combined train shall make sure that:
- the assisting train is coupled to the failed train, and
  - the brake performance of the train is checked, the automatic brake, if compatible, is connected and a brake test has been carried out.
- (5) When the combined train is ready to continue, the driver in control shall contact the signaller and inform the signaller of any restrictions and move the train in accordance with any instructions given by the signaller.

#### 11. AUTHORISATION TO PASS A SIGNAL SHOWING A STOP ASPECT/INDICATION

The driver of the train concerned shall have authorisation to pass a signal showing stop aspect/indication.

When giving authorisation, the signaller shall give the driver any instructions concerning the movement.

The driver shall apply the instructions and shall not exceed any speed restriction, where one is imposed, until reaching the location where the normal operation may be resumed.

#### 12. ANOMALIES IN LINESIDE SIGNALLING

If any of the following anomalies are observed:

- no signal aspect is shown where there should be one;
- an irregular aspect is shown at the signal;
- an irregular signal aspect sequence is received on the approach to the signal;
- the aspect of the signal is not clearly visible.

The driver shall act according to the most restrictive aspect that could be presented by the signal.

In all cases the driver shall report to the signaller the abnormal signalling aspect when observed.

#### 13. EMERGENCY CALL

When receiving an emergency call the driver shall assume that there is a dangerous situation and perform all actions necessary in order to avoid or reduce the effect of this situation.

In addition, the driver shall:

- immediately reduce the speed of the train to the appropriate speed for running on sight; and
- run on sight unless otherwise instructed by the signaller; and
- obey the instructions given by the signaller.

Drivers that have been ordered to stop shall not restart without authorisation from the signaller. Other drivers shall continue running on sight until the signaller informs them that running on sight is no longer necessary.

#### 14. IMMEDIATE ACTIONS TO PREVENT DANGER TO TRAINS

- (1) Any railway undertaking/infrastructure manager staff who become aware of a danger to trains shall take immediate action to stop any trains which may be affected and take any other action as necessary to avoid harm or loss.
- (2) Any driver made aware of a danger to their train shall stop and alert the signaller immediately to the danger.

#### 15. FAILURE OF ON-BOARD EQUIPMENT

The railway undertaking shall determine the cases in which a failure of an on-board equipment affects the running of the train.

The railway undertaking shall give the necessary information to the driver and/or train crew of what action to take in the case of on-board failures that affect the running of the train.

If the driver becomes aware of a failure of any on-board equipment that affects the running of the train, the driver shall:

- Inform the signaller of the situation and the restrictions on the train should the train be allowed to continue its mission,
- The driver shall not commence or recommence the mission until permission to do so has been granted by the signaller,
- If the signaller gives permission for the train to start or continue its mission then the driver shall proceed in accordance with the restrictions placed upon the train,

If the signaller does not give permission for the train to commence or recommence its mission then the driver shall follow the instructions given by the signaller.

#### 16. END OF AUTHORITY PASSED WITHOUT PERMISSION

- If the driver becomes aware that the train has passed an end of authority without permission, the driver shall stop the train immediately.
- If the train is stopped by ATP/TPS, the driver shall take action to support the emergency brake.
- The driver shall inform the signaller.
- If the signaller becomes aware that a train has passed an end of authority without permission, then the signaller shall take any necessary action to stop the train immediately.
- The driver and signaller shall take any necessary action to protect all movements.

When the train is able to continue, the driver shall inform the signaller. The signaller shall set or check the route for the train to continue its journey and issue all necessary instructions

#### 17. FAILURE OF TRACKSIDE EQUIPMENT INCLUDING CATENARY

- The infrastructure manager shall determine whether the failure of trackside equipment (including catenary) affects the safe and/or effective operation of trains.
  - The infrastructure manager shall provide the necessary instructions to the driver of what action to take in the case of such a failure as referenced in this Regulation in point 4.2.1.2.2.3.
  - If the driver becomes aware of a failure of any trackside equipment (including catenary) that affects the safe and/or effective operation of trains, the driver shall inform the signaller of the situation as soon as possible and follow the instructions given by the signaller.
-

## Appendix C

**Safety related communications methodology****C1. Oral communication****1. Scope and Purpose**

This Appendix sets out the rules for safety-related communications, between train crew, mainly the train driver, and signaller, in particular to define its structure, methodology and content. Safety related communication has priority over all other communication.

**2. Safety related communications***2.1. Communication structure*

The transmission of safety-related messages shall be short and clear and, as far as possible, without abbreviation. In order to ensure a message is understood and the necessary action may be undertaken, whoever is giving the message shall cover at least the following points:

- indicate their exact location.
- state the function they are carrying out and information on the action that is needed.

Drivers shall identify themselves by the train running number and the location.

Signallers shall identify themselves by the control area or the location of the signal box.

*2.2. Communication methodology*

Whoever is giving the message shall:

- check that the message is received and repeated back as required. As emergency messages are intended to give urgent operational instructions that are directly linked with the safety of the railway, the repetition of these messages may be omitted.
- if necessary, correct a mistake that has been made in the message.
- if necessary, let the person know how they may be contacted.

For communication between signallers and drivers it is the signallers' responsibility to ensure that they are talking to the driver within their control area. This is critical when communication is taking place in areas where communications boundaries overlap. This principle shall apply even after an interruption during transmission.

*2.3. Communication content*

The following messages shall be used for identification by the different parties:

- by the signaller:

Train ..... [running number] this is ..... [control area/location of the signal box]
---

- by the driver:

this is train ..... [running number] at ..... [location]
--

Terminology shall be used in the communication procedure by all the parties:

Situation	Terminology
Term transferring the opportunity to speak to the opposite party	'Over'
Term confirming that the sent message has been received	'Received'
Term used to have the message repeated in the event of poor reception or misunderstanding	'Say again'
Term used to ascertain whether a read-back message exactly matches the sent message	'Correct'
Term used to indicate that a read-back message does not match the sent message	'Error (+ I say again)'
Term used to keep the other party waiting when there is a temporary break in the communication and the connection is not broken	'Wait'
Term used to tell the other party that the communication might be broken but should be resumed later on	'I call again'
Term used to indicate that the message has ended	'Out'

Standard terminology shall be used in the communication procedure by all the parties without translation:

Situation	Standard terminology
Term used to indicate that there is an emergency situation	'Mayday, mayday, mayday'

This term shall not be translated and does not have to be used in case emergency call functionality is available on the train (e.g. GSM-R).

### 3. Communication rules

In order that safety related communication is correctly understood, whatever the communication mean is used, the following rules shall be used:

#### 3.1. International Phonetic Alphabet

The International Phonetic Alphabet shall be used:

- to identify letters of the alphabet;
- to spell words and location names that are difficult to say, or may be misunderstood;
- when quoting the identity of signals or points.

A Alpha	G Golf	L Lima	Q Quebec	V Victor
B Bravo	H Hotel	M Mike	R Romeo	W Whisky
C Charlie	I India	N November	S Sierra	X X-ray
D Delta	J Juliet	O Oscar	T Tango	Y Yankee
E Echo	K Kilo	P Papa	U Uniform	Z Zulu
F Foxtrot				

### 3.2. Numbers

The Numbers shall be spoken digit by digit:

0 = Zero
1 = One
2 = Two
3 = Three
4 = Four
5 = Five
6 = Six
7 = Seven
8 = Eight
9 = Nine

## C2. Operational instructions

### 1. Introduction

Railway undertakings and infrastructure managers shall use European instructions in the communication procedure in the following cases:

- (1) Permission to pass an End of Authority — signal showing a stop aspect/stop indication;
- (2) Permission to proceed after a trip (ETCS);
- (3) Obligation to remain at standstill, obligation to carry out end of mission (ETCS);
- (4) Revocation of an operational instruction;
- (5) Obligation to run under restrictions;
- (6) Obligation to run on sight;
- (7) Permission to start in Staff Responsible (ETCS) after preparing a movement;
- (8) Permission to pass a defective level crossing;
- (9) Obligation to run with power supply restrictions;
- (10-20) RESERVED

The numbers 1 to 20 are reserved for European instructions, numbers 1-5 and 7 are mandatory for ETCS. If an operational instruction related to class B system requires more information than the European instructions, the national instruction may be used instead. In such case, the infrastructure manager may define these requirements in its national instructions. If numbered, the national instructions defined by the individual infrastructure managers shall start from 21 onwards. The national instructions shall contain at least the same content of that for a European instruction.

### 2. Content

An operational instruction shall state the following as a minimum:

- from where it was issued (location of signaller),
- at what date it was issued (not for verbal instruction),
- to which train/shunting movement it refers,
- clear, precise, unambiguous instructions,
- unique identification provided by the signaller.

In addition, depending on the circumstances, an operational instruction might also state:

- at what time it was issued,
- where that train/shunting movement is located, at which location it applies,
- ID of train driver;
- ID of issuer;
- verification (signature or electronic confirmation) that the instruction has been received.

Any operational instruction that has been issued to be written down may only be revoked by a European instruction n°4 explicitly referring to the unique identification of the instruction to be revoked.

### 3. **Delivery of the operational instruction**

A European instruction includes information delivered electronically, verbally, physically on paper or as verbal instructions to be written down by the train driver or by other safe methods of communication with the same level of information.

In principle when it is necessary for an operational instruction to be written down by the train driver, the train shall be at standstill. The railway undertaking and the concerned infrastructure manager may jointly undertake a risk assessment which could, as a result, define the conditions under which it is safe to deviate from this principle.

An operational instruction shall be delivered as close as practicable to the affected area.

An operational instruction takes precedence over the related indications provided by trackside signals and/or the DMI. When a permitted speed or a release speed lower than the maximum speed prescribed in the operational instruction is applicable, the lowest speed shall be applied.

An operational instruction shall only be issued by the signaller when the train running number has been identified and, if necessary, the location of the train/shunting movement. Before applying the operational instruction, the train driver shall check that this operational instruction refers to her/his train/shunting movement and her/his current or identified location.

### 4. **Awareness of the operational instruction**

The railway undertaking has to define a procedure to ensure that the train driver is aware of an operational instruction until the train has reached the location where it has to be processed.

When the operational instruction does not need to be performed immediately after its delivery, it shall be possible for the train driver to retrieve the operational instruction.

### 5. **Monitoring of processed operational instruction**

As part of the compliance with Regulation (EU) 2018/762 and Directive (EU) 2016/798, the infrastructure manager and railway undertaking shall monitor the processes of delivery and use of the operational instructions.

### 6. **European instructions**

Each field of information contained in a European instruction shall be given its own identifier.

While the content and the identifiers shall be used, the format itself is indicative.

If a specific field is not to be used in a Member State or on the network of an infrastructure manager, there is no obligation to display this field in the European instruction and no field shall be added.

<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>A</b> Train No	<b>B</b> Date	<b>C</b> Location of issuer
<input type="text"/>		<input type="text"/>
<b>D</b> Location of Train		<b>E</b> Unique identification

1 **European Instruction 1 – Permission to pass EOA/signal showing a stop aspect/stop indication at**

<input type="text"/>	<input type="text"/>	<input type="text"/>
1.10 Km/Signal/From.	1.11 Km/Signal/From/To	1.12 Km/Signal/to

x.30 Run with a maximum speed of

<input type="text"/>	from	<input type="text"/>	to	<input type="text"/>
x.31 Km/h/Mph		x.32 Location Km/Signal		x.33 Location Km/Signal

x.40 Is exempted from running on sight

<input type="checkbox"/> x.60 Set SR speed to	<input type="text"/>	<input type="checkbox"/> x.65 Set SR distance to	<input type="text"/>
	x.61 Km/h/Mph		x.66 m

x.90 Additional instructions

x.91 Free text

<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>M</b> ID of Driver	<b>N</b> ID of Issuer	<b>O</b> Time

**A** Train/Shunting movement No

**B** Date

**C** Location of issuer

**D** Location of Train/Shunting movement

**E** Unique identification

## European Instruction 2 – Permission to proceed after a TRIP

Select start and if no MA received, is allowed to start in SR

2.10

Select SH

2.11

Run with a maximum speed of

x.30

from

to

x.31 Km/h/Mph

x.32 Location/Km/Signal

x.33 Location/Km/Signal

Is exempted from running on sight

x.40

Examine the line for the following reason

x.45

x.46 Free text

Report findings to

x.50

x.51 Free text

Set SR speed to

x.60

x.61 Km/h/Mph

Set SR distance to

x.65

x.66 m

Additional instruction

x.90

x.91 Free text

**M** ID of Driver

**N** ID of Issuer

**O** Time



**A** Train No

**B** Date

**C** Location of issuer

**D** Location of Train

**E** Unique identification

3

### European Instruction 3 – Obligation to remain at standstill/Carry out End of Mission (EoM)

3.10

Remain at Standstill at the current position

3.11

Carry out End of Mission (EoM)

x.90

Additional instruction

x.91 Free text

**M** ID of Driver

**N** ID of Issuer

**O** Time

**A** Train No

**B** Date

**C** Location of issuer

**D** Location of Train

**E** Unique identification

### European Instruction 4 – Revocation of an instruction

4

Operational instruction with unique identification  is revoked

4.10

X 4.11 unique identification

Additional instruction

x.90

x.91 Free text

**M** ID of Driver

**N** ID of Issuer

**O** Time

<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>A</b> Train No	<b>B</b> Date	<b>C</b> Location of issuer
<input type="text"/>		<input type="text"/>
<b>D</b> Location of Train		<b>E</b> Unique identification

5 **European Instruction 5 – Obligation to run with speed restriction**

x.30 Run with a maximum speed of  x.31 Km/h/Mph

Between/in  x.32 Location/Km/Signal and  x.33 Location/Km/Signal on  5.39 Track/Line

from  x.35 Location/Km/Signal to  x.36 Location/Km/Signal

Lineside boards  5.37 Yes  5.38 No

x.45 Examine the line for the following reason  x.46 Free text

x.50 Report findings to  x.51 Free text

x.90 Additional instruction  x.91 Free text

<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>M</b> ID of Driver	<b>N</b> ID of Issuer	<b>O</b> Time

**A** Train No

**B** Date

**C** Location of issuer

**D** Location of Train

**E** Unique identification

### European Instruction 6 – Obligation to run on sight

6

6.10

Run on sight

Between/in  and  on

6.11 Location

6.12 Location

6.13 Track/Line

from  to

6.14 Km/Signal

6.15 Km/Signal

x.30

Run with a maximum speed of

from  to

x.31 Km/h/Mph

x.32 Location/Km/Signal

x.33 Location/Km/Signal

x.45

Examine the line for the following reason

x.46 Free text

x.50

Report findings to

x.51 Free text

x.90

Additional instruction

x.91 Free text

**M** ID of Driver

**N** ID of Issuer

**O** Time

**A** Train/Shunting movement No

**B** Date

**C** Location of issuer

**D** Location of Train/Shunting movement

**E** Unique identification

### European Instruction 7 – Permission to start in SR after preparing a movement

Is allowed to start in SR

7.10

Is allowed to overpass EoA at

7.20

7.21 Km/Signal

Run with a maximum speed of

x.30

from

to

x.31 Km/h/Mph

x.32 Location/Km/Signal

x.33 Location/Km/Signal

Is exempted from running on sight

x.40

Set SR speed to

x.60

x.61 Km/Mph

Set SR distance to

x.65

x.66 m

Additional instruction

x.90

x.91 Free text

**M** ID of Driver

**N** ID of Issuer

**O** Time

**A** Train No

**B** Date

**C** Location of issuer

**D** Location of Train

**E** Unique identification

  
8

### European Instruction 8 – Permission to pass a defective level crossing

  
8.05

Stop before level crossing (at)

8.06 Km/ID

8.07 Km/ID

  
8.10

Examine level crossing (at)

8.11 Km/ID

8.12 Km/ID

Between/in

8.13 Location

and

8.14 Location

on

8.15 Track/Line

  
8.25

Activate level crossing manually

  
x.30

Run with a maximum speed of

x.31 Km/h/Mph.

from

x.32 Location/Km/Signal

to

x.33 Location/Km/Signal

  
8.70

Activate audible warning device

from

8.71 Km/Signal

to

8.72 Km/Signal

  
8.80

Pass level crossing

  
x.90

Additional instruction

x.91 Free text

**M** ID of Driver

**N** ID of Issuer

**O** Time

<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>A</b> Train No	<b>B</b> Date	<b>C</b> Location of issuer
<input type="text"/>		<input type="text"/>
<b>D</b> Location of Train		<b>E</b> Unique identification

9 **European Instruction 9 – Obligation to run with power supply restriction**

<input type="checkbox"/> 9.10 Run with lowered pantograph	<input type="checkbox"/> 9.15 Run with "main switch off"
<input type="checkbox"/> 9.20 Reduce power consumption to <input type="text"/>	<input type="text"/> %/Amp./KVA
	9.21 Value                      9.22 Measure unit
Between/in <input type="text"/>	and <input type="text"/> on <input type="text"/>
	9.23 Location/Km/Signal                      9.24 Location/Km/Signal                      9.25 Track/Line
Lineside boards <input type="checkbox"/> 9.28 <del>Yes</del>	<input type="checkbox"/> 9.29 No
<input type="checkbox"/> x.45 Examine the line for the following reason	<input type="text"/>
	x.46 Free text
<input type="checkbox"/> x.50 Report findings to	<input type="text"/>
	x.51 Free text
<input type="checkbox"/> x.90 Additional instruction	<input type="text"/>
	x.91 Free text

<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>M</b> ID of Driver	<b>N</b> ID of Issuer	<b>O</b> Time

## 7. **Communication of an operational instruction**

Terminology shall be used in the communication procedure by all the parties:

Situation	Terminology
Cancelling an operational instruction	'Cancel procedure'
If the message is then subsequently to be resumed, the procedure shall be repeated from the start	'Error during transmission'
When a transmission error is discovered by the sender, the sender shall request cancellation	'Error (+ prepare new form) Or 'Error (+ I say again)'
Error during read back	'Error (+ I say again)'
Misunderstanding: if one of the parties does not fully understand a message, the message shall be repeated	'Say again (+ speak slowly)'

## 8. **Book of Forms**

The infrastructure manager is responsible for drawing up the Book of Forms and the forms themselves in its operating language.

All the forms to be used shall be assembled in a document or a computer medium called the Book of Forms.

This Book of Forms shall be used by both the driver and the staff authorising the movement of trains. The Book used by the driver and the Book used by the staff authorising the movement of trains shall be structured and numbered in the same way.

The Book of Forms shall comprise two parts.

The first part contains at least the following items:

- an index of operational instruction Forms;
- a list of situations to which each form applies;
- the table containing the international phonetic alphabet.

The second part contains the forms themselves. These shall be collected by the railway undertaking and given to the driver.

## 9. **Glossary of Railway Terminology**

The railway undertaking shall produce a glossary of railway terminology for each network over which its trains operate. It shall supply the terms in regular use in the language chosen by the railway undertaking and in the 'operating' language of the infrastructure manager(s) whose infrastructure the railway undertaking operates on.



## Route compatibility and Route Book

## D1 Parameters for the vehicle and train compatibility over the route intended for operation

Note:

1. Following the requirements of 4.2.2.5.1, the railway undertaking may cover route compatibility checks of certain parameters during earlier stages.
2. All parameters must be checked at vehicle level: this is indicated by a 'X' in the column 'Vehicle level'. Some parameters need to be checked when the train composition changes, as defined in the section 4.2.2.5; those parameters are indicated with a 'X' under the column 'Train level'.
3. With a view to avoid duplication of testing, in relation to parameters 'Traffic loads and load carrying capacity of infrastructure' and 'Train detection systems', the infrastructure managers shall provide through RINF the list of vehicle types or vehicles compatible with the route for which they have already verified route compatibility, where such information is available.

Route compatibility check interface	Vehicle information (either from ERATV, the technical file, or any other appropriate means of information)	Route information available in Register of Infrastructure (RINF) or provided by Infrastructure manager until RINF is complete	Vehicle level	Train level	Procedure to check the vehicle and train compatibility over the route intended for operation
Traffic loads and load carrying capacity of infrastructure	<p>Static axle loads and design and operational masses in the following load cases:</p> <ul style="list-style-type: none"> <li>— design mass as defined in Regulation (EU) No 1302/2014</li> <li>— in working order;</li> <li>— under normal payload;</li> <li>— under exceptional payload;</li> </ul> <p>— Where relevant operational mass in accordance with EN 15663: 2017-A1 2018:</p> <ul style="list-style-type: none"> <li>— in working order;</li> <li>— under normal payload.</li> </ul> <p>Maximum design speed;</p> <p>Vehicle length;</p> <p>The position of the axles along the unit (axle spacing).</p> <p>Static compatibility check for Wagons:</p> <p>Permissible payload for different line categories according to WAG TSI.</p>	<p>1.1.1.1.2.4 Load capability</p> <p>1.1.1.1.2.4.1 National classification for load capability</p> <p>1.1.1.1.2.4.2 Compliance of structures with the High Speed Load Model (HSLM)</p> <p>1.1.1.1.2.4.3 Railway location of structures requiring specific checks</p> <p>1.1.1.1.2.4.4 Document(s) with the procedure(s) for static and dynamic route compatibility checks</p>	x	x	<p>The static compatibility checks for vehicles and, when necessary in accordance with the information provided by the infrastructure manager, the dynamic compatibility checks for trains shall be performed according to the procedure(s) or relevant information provided by the infrastructure manager through RINF under the parameter 1.1.1.1.2.4.4.</p> <p><b>For freight wagons:</b></p> <p>The static compatibility check is performed according to the following sections of EN 15528:2015: 4 to 7, Annex A, Annex D or, for the United Kingdom of Great Britain and Northern Ireland networks, relevant national rules in accordance with 4.2.7.4 (4) of Commission Regulation (EU) No 1299/2014 (1).</p>

Route compatibility check interface	Vehicle information (either from ERATV, the technical file, or any other appropriate means of information)	Route information available in Register of Infrastructure (RINF) or provided by Infrastructure manager until RINF is complete	Vehicle level	Train level	Procedure to check the vehicle and train compatibility over the route intended for operation
Gauging	Vehicle gauge: <ul style="list-style-type: none"> <li>— Reference profiles for which the vehicle was authorised;</li> <li>— other gauges assessed.</li> </ul>	1.1.1.1.3.1.1 gauging 1.2.1.0.3.4 gauging 1.1.1.1.3.1.2 Railway location of particular points requiring specific checks 1.1.1.1.3.1.3 Document with the transversal section of the particular points requiring specific checks 1.2.1.0.3.5 Railway location of particular points requiring specific checks 1.2.1.0.3.6 Document with the transversal section of the particular points requiring specific checks	X	X	Comparison of the declared reference profiles between Vehicle/Train and the intended route.  For the specific cases referred to in TSI 1302/2014 section 7.3.2.2 and TSI 1299/2014 sections 7.7.17.2 and 7.7.17.9 a specific procedure for route compatibility check can be applied. For such purpose, the Infrastructure Manager shall make available the relevant information.  The infrastructure manager shall identify particular points which deviate from the declared reference profile in RINF parameters: 1.1.1.1.3.1.1 and 1.2.1.0.3.4. For these cases, RINF shall be updated accordingly (parameters: 1.1.1.1.3.1.2, 1.1.1.1.3.1.3).  <i>Note:</i> Additional discussion between Infrastructure Manager and Railway Undertaking might be needed for checking these specific points.
Vertical radius	Minimum vertical: <ul style="list-style-type: none"> <li>— convex curve radius capability</li> <li>— concave curve radius capability</li> </ul>	1.2.2.0.3.3 Minimum radius of vertical curve (Concern siding)	X		Comparison of the declared minimum radius of vertical curve between vehicle and the intended route.
Train detection systems	Type of train detection systems for which the vehicle has been designed and assessed	1.1.1.3.7.1.1 Type of train detection system 1.1.1.3.7.1.2 Type of track circuits or axle counters to which specific checks are needed. 1.1.1.3.7.1.3 Document with the procedure(s) related to the type of train detection systems declared in 1.1.1.3.7.1.2 Specific to the French network: 1.1.1.3.7.1.4 Section with train detection limitation	X		Comparison of the declared type of train detection system(s) between Vehicle and the intended route.  <i>Note:</i> At vehicle authorisation, based on TSIs and national rules, the technical compatibility between the Vehicle and all train detection system(s) of the network(s) in the area of use is verified.  In duly-justified cases (e.g. problems of non-detection of the vehicle occurring during operation), tests and/or checks could be done after vehicle authorisation, involving Railway Undertaking and Infrastructure Manager.

Route compatibility check interface	Vehicle information (either from ERATV, the technical file, or any other appropriate means of information)	Route information available in Register of Infrastructure (RINF) or provided by Infrastructure manager until RINF is complete	Vehicle level	Train level	Procedure to check the vehicle and train compatibility over the route intended for operation
Hot axle box detection	Axle bearing condition monitoring (hot axles box detection)	<p>1.1.1.1.7.4 Existence of trackside Hot axle box detection</p> <p>Specific to the French, Italian and Swedish networks:</p> <p>1.1.1.1.7.5 Trackside Hot axle box detection TSI compliant: (Y/N), If No:</p> <ul style="list-style-type: none"> <li>— 1.1.1.1.7.6 Identification of trackside hot axle box detection;</li> <li>— 1.1.1.1.7.7 Generation of trackside hot axle box detection;</li> <li>— 1.1.1.1.7.8 Railway location of trackside hot axle box detection;</li> <li>— 1.1.1.1.7.9 Direction of measurement of trackside hot axle box detection</li> </ul>	X		<p><b>For existing non-TSI compliant vehicle:</b></p> <p>Comparison of the declared compliance to track side HABD between vehicle and the intended route, when the network(s) of the area of use is composed of more than one 'type' of track side HABD. If the network(s) of the area of use is composed by only one type of trackside hot axle box detector, no route compatibility check is needed.</p> <p><i>Note:</i></p> <p>For TSI compliant vehicle: Compatibility with track-sides for network(s) of an area of use is verified at authorisation phase. Any specificity of the network has to be covered by a specific case.</p>
Running characteristics	<p>Combination(s) of maximum speed and maximum cant deficiency to which the vehicle was authorised (operational envelope that the vehicle has been assessed for);</p> <p>Rail inclination.</p>	<p>1.1.1.1.4.2 Cant deficiency</p> <p>1.1.1.1.2.5 Maximum permitted speed</p> <p>1.1.1.1.4.3 Rail inclination</p>	X		<p>Comparison of the combination of maximum speed, maximum cant deficiency and rail inclination(s), to which the Vehicle is assessed, with the cant deficiency, speed and rail inclination(s) declared in RINF or information provided by Infrastructure Manager.</p> <p>In case vehicle characteristics don't match infrastructure characteristics and the compatibility between the vehicle and the route might be compromised, the Infrastructure Manager shall provide the exact combination of speed and cant deficiency for the specific points in which the compatibility might be compromised within one month, free of charge and in an electronic format.</p> <p><i>Note:</i></p> <p>The output of the check should be taken into account by the Railway Undertaking for the route book preparation. Operational conditions might be imposed as a result of this check (e.g. speed restriction for a section of line).</p>

Route compatibility check interface	Vehicle information (either from ERATV, the technical file, or any other appropriate means of information)	Route information available in Register of Infrastructure (RINF) or provided by Infrastructure manager until RINF is complete	Vehicle level	Train level	Procedure to check the vehicle and train compatibility over the route intended for operation
Wheelset	Wheel set gauge	1.1.1.1.4.1 Nominal track gauge 1.2.1.0.4.1 Nominal track gauge	X		Comparison of the wheelset gauge with track gauge of the intended route.
Wheelset	Minimum in-service wheel diameter	1.1.1.1.5.2 Minimum wheel diameter for fixed obtuse crossings	X		Comparison of the minimum wheel diameter between Vehicle and the intended route.
Wheelset	Type of changeover facilities to which the vehicle is designed for	1.2.0.0.0.5 Geographical location of Operational Point 1.2.0.0.0.4.1 Type(s) of track gauge changeover facility (ies)	X		Comparison of the type(s) of changeover facilities to which the vehicle is designed for with the type(s) of track gauge changeover facilities of the intended route.
Minimum curve	Minimum horizontal curve radius capability	1.1.1.1.3.7 Minimum radius of horizontal curve 1.2.2.0.3.2 Minimum radius of horizontal curve	X	X	Comparison of the minimum horizontal curve radius between vehicle and the intended route.
Braking	Emergency braking and maximum service brake: Stopping distance, Maximum deceleration, for the load condition 'design mass under normal payload' at the design maximum speed.  For general operation (*), in addition to the above data: brake weight percentage (lambda)	1.1.1.3.11.1 Maximum braking distance requested 1.1.1.1.3.6 Gradient profile 1.1.1.1.2.5 Maximum permitted speed 1.1.1.1.6.1 Maximum train deceleration 1.1.1.3.11.2 Availability by the infrastructure manager of additional information mentioned in the section 4.2.2.6.2.(2) is available or not (Y/N)  If yes: 1.1.1.3.11.3 Reference to the document(s) to be indicated in RINF.	X	X	<b>For pre-defined formation (as referred in section 2.2.1 of TSI 1302/2014):</b>  Comparison of the declared stopping distance and maximum train deceleration between Rolling Stock and the intended route for each load condition per design maximum speed.  <b>For general operation (*):</b>  No specific suggested procedure, to be covered by Railway Undertaking safety management system.
Braking	Thermal capacity: — Reference case of TSI; — if no reference case is indicated, thermal capacity expressed in terms of: — Speed; — Gradient; — Distance; — Time (if distance is not indicated)	1.1.1.1.3.6 Gradient profile 1.1.1.1.2.5 Maximum permitted speed	X		Comparison of the vehicle reference case with the intended route characteristics.  <i>Note:</i>  RINF or information provided by Infrastructure Manager, indicates location of change in km, gradient length can be calculated by extracting data.

Route compatibility check interface	Vehicle information (either from ERATV, the technical file, or any other appropriate means of information)	Route information available in Register of Infrastructure (RINF) or provided by Infrastructure manager until RINF is complete	Vehicle level	Train level	Procedure to check the vehicle and train compatibility over the route intended for operation
Braking	Maximum gradient on which the unit is kept stationary by the parking brake alone (if the vehicle is fitted with it)	1.1.1.1.3.6 Gradient profile 1.2.2.0.3.1 Gradient for stabling tracks	X	X	Comparison of the declared maximum gradient profile between vehicle and the intended route.  <i>Note:</i> The output of the comparison should be taken into account by the Safety Management System of the Railway Undertaking (e.g. use of additional means)
Magnetic track brake	Possibility of preventing the use of the magnetic brake (only if fitted with magnetic brake)	1.1.1.1.6.3 Use of magnetic brakes 1.1.1.1.6.5 Document with the conditions of use of magnetic track brake.	X		Verification if the use of magnetic track brake is allowed in the intended route.  <i>Notes:</i> Where magnetic brake is allowed, the infrastructure manager shall provide the conditions of its use. The output of the check should be taken into account by the Safety Management System of the Railway Undertaking (e.g. preventing the use of magnetic track brake in the section of line).
Eddy current track brake	Possibility of preventing the use of the eddy current brake (only if fitted with eddy current brake)	1.1.1.1.6.2 Use of eddy current brakes 1.1.1.1.6.4 Document with the conditions of use of eddy current brake.	X		Verification if the use of Eddy current track brake is allowed in the intended route.  <i>Notes:</i> Where Eddy current track brake is allowed, the infrastructure manager shall provide the conditions of its use. The output of the check should be taken into account by the Safety Management System of the Railway Undertaking (e.g. preventing the use of eddy current track brake in the section of line).
Weather conditions	Temperature range	1.1.1.1.2.6 Temperature range	X		Comparison of the declared temperature range between vehicle and the intended route.  <i>Note:</i> The Safety Management System of the Railway Undertaking shall consider any possible restrictions when the compared temperature range diverge.

Route compatibility check interface	Vehicle information (either from ERATV, the technical file, or any other appropriate means of information)	Route information available in Register of Infrastructure (RINF) or provided by Infrastructure manager until RINF is complete	Vehicle level	Train level	Procedure to check the vehicle and train compatibility over the route intended for operation
Weather conditions	Snow, ice and hail condition	1.1.1.1.2.8 Existence of severe climatic conditions	X		<p>Comparison of the declared vehicle 'Snow, ice and hail condition' (e.g. S1) with and the 'Existence of severe climatic conditions' in the intended route.</p> <p><i>Note:</i></p> <p>The Safety Management System of the Railway Undertaking shall consider any possible restrictions. Discussion between Railway Undertaking and Infrastructure Manager to identify the possible restrictions.</p>
Voltages and frequencies	<p>Energy supply system:</p> <ul style="list-style-type: none"> <li>— Nominal voltage and frequency;</li> <li>— Type of contact line system</li> <li>— For existing not TSI compliant vehicle and intended to operate in the specific lines mentioned in TSI ENE 1301/2014 section 7.4.2.2.1: Umax2.</li> </ul>	<p>1.1.1.2.2.1.1 Type of contact line system</p> <p>1.1.1.2.2.1.2 Energy supply system (Voltage and frequency)</p> <p>1.1.1.2.2.1.2.1 Energy supply system TSI compliant</p> <p>Specific cases defined in TSI ENE 1301/2014 section 7.4.2.2.1:</p> <p>1.1.1.2.2.1.3 Umax2 for lines referred to in sections 7.4.2.2.1 and 7.4.2.11.1 of Commission Regulation (EU) No 1301/2014 (?).</p>	X		<p>Comparison of the declared voltage between vehicle and the intended route of the traction supply system (nominal voltage and frequency) and type of contact line system.</p>
Regenerative brake	Possibility of preventing the use of the regenerative brake (only if fitted with regenerative brake)	1.1.1.2.2.4 Permission for regenerative braking	X		<p>Verification if the use of the regenerative brake is allowed in the intended route or under specific conditions.</p> <p><i>Note:</i></p> <p>The output of the check should be taken into account by the Safety Management System of the Railway Undertaking (e.g. preventing the use of the regenerative brake in the section of line).</p>
Current limitation	Electric units equipped with power or current limitation function.	1.1.1.2.5.1 Current or power limitation on board	X		<p>Verification if the intended route require that the vehicle is equipped with a current or power limitation.</p> <p><i>Note:</i></p> <p>TSI-compliant Rolling Stock with a maximum power higher than 2MW are equipped with current or power limitation.</p>

Route compatibility check interface	Vehicle information (either from ERATV, the technical file, or any other appropriate means of information)	Route information available in Register of Infrastructure (RINF) or provided by Infrastructure manager until RINF is complete	Vehicle level	Train level	Procedure to check the vehicle and train compatibility over the route intended for operation
Pantograph	Maximum current at standstill per pantograph for each DC systems the vehicle is equipped for	1.1.1.2.2.3 Maximum current at standstill per pantograph 1.2.2.0.6.1 Maximum current at standstill per pantograph	X		Comparison of the declared maximum current at standstill per pantograph for each DC systems, between vehicle and the intended route.
Pantograph	Height of interaction of pantograph with contact wires (over top of rail) for each energy supply system the vehicle is equipped for	1.1.1.2.2.5 Maximum contact wire height 1.1.1.2.2.6 Minimum contact wire height	X		Comparison of the height of interaction of pantograph with contact wires, for each energy supply system, between the vehicle and the intended route.
Pantograph	Pantograph head for each energy supply system the vehicle is equipped for	1.1.1.2.3.1 Accepted TSI compliant pantograph heads 1.1.1.2.3.2 Accepted other pantograph heads	X		Comparison of the pantograph head geometry (including insulated or nor not insulated horns for 1 950 mm), for each energy supply system, between the vehicle and the intended route.
Pantograph	Material of pantograph contact strip the vehicle may be equipped with for each energy supply system the vehicle is equipped for	1.1.1.2.3.4 Permitted contact strip material	X		Comparison of material of pantograph contact strip, for each energy supply system, between the vehicle and the intended route.
Pantograph	Mean contact force curve	1.1.1.2.5.2 Contact force permitted	X		Comparison of mean contact force between the vehicle and the intended route: <b>For TSI-Compliant vehicle intended to operate in Non-TSI conform line(s):</b> comparison of mean contact force between the vehicle and the intended route, for each voltage. <b>For existing non TSI-compliant vehicle:</b> comparison of the mean contact between vehicle and the intended route, for each voltage. <i>Note:</i> A TSI-compliant vehicle is authorised with a mean contact force within limits values defined in EN 50367:2012 Table 6.

Route compatibility check interface	Vehicle information (either from ERATV, the technical file, or any other appropriate means of information)	Route information available in Register of Infrastructure (RINF) or provided by Infrastructure manager until RINF is complete	Vehicle level	Train level	Procedure to check the vehicle and train compatibility over the route intended for operation
Pantograph	<p>Number of pantographs in contact with the overhead contact line (OCL) (for each energy supply system the vehicle is equipped for);</p> <p>Shortest distance between two pantographs in contact with the OCL (for each energy supply system the vehicle is equipped for; for single and, if applicable, multiple operation) (only if number of raised pantographs is more than 1);</p> <p>Type of OCL used for the test of current collection performance (for each energy supply system the vehicle is equipped for) (only if number of raised pantographs is more than 1).</p>	1.1.1.2.3.3 Requirements for number of raised pantographs and spacing between them, at the given speed	X	X	<p><b>For pre-defined formation (as referred in section 2.2.1 of TSI 1302/2014):</b></p> <p>For each energy supply system:</p> <ul style="list-style-type: none"> <li>— Comparison of number of vehicle pantographs in contact with the OCL and the intended route;</li> <li>— Comparison of the vehicle shortest distance between two pantographs in contact with the OCL and the intended route.</li> </ul> <p><b>For general operation (*):</b></p> <p>Covered by Railway Undertaking safety management system, considering the conditions imposed by the Infrastructure Manager, as in RINF or information provided by Infrastructure Manager.</p> <p><i>Note:</i></p> <p>The output of the comparison, concerning a minimum distance between two raised pantographs, might result in operational constraint on the vehicle to be considered by the safety management system of the Railway Undertaking (e.g. a two pantographs raised Electrical Multiple Units is forced to lower one pantograph).</p>
Pantograph	Automatic dropping device (ADD) fitted (for each energy supply system the vehicle is equipped for)	1.1.1.2.5.3 Automatic dropping device required	X		Verification if the intended route(s) require that the vehicle is equipped with an automatic dropping device.
Specific to the French network: Phase separation	Distance between cab and pantograph for reverse or multiple unit	1.1.1.2.4.3 Distance between signboard and phase separation ending		x	<p>Verification if the positioning of signboards identifying the place where driver is allowed to raise pantographs or close circuit breakers again on the intended route(s) is compatible with the distance between cab and pantograph for reverse or multiple unit.</p> <p>Where there is incompatibility, the signboard is to be moved and be settled far enough to ensure drivers do not raise pantographs too early.</p>



Route compatibility check interface	Vehicle information (either from ERATV, the technical file, or any other appropriate means of information)	Route information available in Register of Infrastructure (RINF) or provided by Infrastructure manager until RINF is complete	Vehicle level	Train level	Procedure to check the vehicle and train compatibility over the route intended for operation
Tunnel	Fire safety category	1.1.1.1.8.10 Fire category of rolling stock required 1.1.1.1.8.11 National fire category of rolling stock required 1.2.1.0.5.7 Fire category of rolling stock required 1.2.1.0.5.8 National fire category of rolling stock required 1.2.2.0.5.7 Fire category of rolling stock required 1.2.2.0.5.8 National fire category of rolling stock required	X		Comparison between fire safety category of vehicle and intended route.
train length	Train length	1.2.2.0.2.1 Usable length of siding 1.2.1.0.6.4 Usable length of platform	X	X	<p><b>For fixed and pre-defined formation (as referred in section 2.2.1 of TSI 1302/2014):</b></p> <p>Comparison of unit(s) length (single or multiple operation) with the 'siding and platform' length(s) of the intended route.</p> <p><b>For general operation (*):</b></p> <p>Verification of the composed train length with the 'siding and platform' length(s) of the intended route.</p> <p><i>Note:</i></p> <p>The output of the check should be taken into account by the Railway Undertaking in its Safety Management System. Operational conditions might be imposed as a result of this check.</p>
Platform height and access and egress	Platform heights for which the vehicle is designed	1.2.1.0.6.5 Height of platform	X		<p>Comparison of platform heights between the vehicle and the intended route.</p> <p><i>Note:</i></p> <p>The output of the check should be taken into account by the Railway Undertaking in its Safety Management System. Operational conditions might be imposed as a result of this check.</p>

Route compatibility check interface	Vehicle information (either from ERATV, the technical file, or any other appropriate means of information)	Route information available in Register of Infrastructure (RINF) or provided by Infrastructure manager until RINF is complete	Vehicle level	Train level	Procedure to check the vehicle and train compatibility over the route intended for operation
ETCS	ETCS System Compatibility	1.1.1.3.2.9 ETCS System Compatibility	X		Comparison ETCS System Compatibility value in RINF is included in the vehicle authorisation.
ETCS	Train Integrity	1.1.1.3.2.8 Train integrity confirmation from on-board necessary for line access	X	X	Comparison that vehicle/train is able to confirm the train integrity if required by trackside.
GSM-R	Radio System Compatibility Voice	1.1.1.3.3.9 Radio System Compatibility Voice	X		Comparison Radio System Compatibility voice value in RINF is included in the vehicle authorisation.
GSM-R	Radio System Compatibility Data	1.1.1.3.3.10 Radio System Compatibility data	X		Comparison Radio System Compatibility data value in RINF is included in the vehicle authorisation.
GSM-R	SIM Card GSM-R Home Network	1.1.1.3.3.5 GSM-R networks covered by a roaming agreement	X		Comparison that the SIM Card GSM-R Home Network is in the list of GSM-R networks with roaming agreement for all sections in the route. This has to be performed for all SIM Cards in the vehicle (Voice and Data).
GSM-R	Sim card support of group ID 555	1.1.1.3.3.4 Use of Group 555	X		Check that the Group ID 555 is used trackside. If this is not configured on-board, alternative operational procedures should be prior established with the Infrastructure Manager.
Class B	Class B train protection legacy system	1.1.1.3.5.3 Train protection legacy systems	X		Comparison of name and version of the Class B train protection legacy system.
Class B	Class B radio legacy system	1.1.1.3.6.1 Radio legacy system	X		Comparison of name and version of the Class B radio legacy system.

(\*) General operation: A unit is designed for general operation when the unit is intended to be coupled with other unit(s) in a train formation which is not defined at design stage

(<sup>1</sup>) Commission Regulation (EU) No 1299/2014 of 18 November 2014 on the technical specifications for interoperability relating to the 'infrastructure' subsystem of the rail system in the European Union (OJ L 356, 12.12.2014, p. 1).

(<sup>2</sup>) Commission Regulation (EU) No 1301/2014 of 18 November 2014 on the technical specifications for interoperability relating to the 'energy' subsystem of the rail system in the Union (OJ L 356, 12.12.2014, p. 179).

**D2 Elements the infrastructure manager has to provide to the railway undertaking for the Route Book**

Number	Route Book
1	<b>Generic information regarding the infrastructure manager</b>
1.1	infrastructure manager's Name
2	<b>Maps and Diagrams</b>
2.1	<b>Map: schematic overview including</b>
2.1.1	Line sections
2.1.2	Principal locations (stations, yards, junctions, freight terminals)
2.2	<b>Line diagram</b>
2.2.1	Indication of running lines, loops catch/trap points and access to sidings
2.2.2	Principal locations (stations, yards, junctions, freight terminals) and their position relative to the line
2.2.3	Location, type and name of all fixed signals relevant for trains
2.3	<b>Station/Yard/Depot diagrams</b>
2.3.1	Name of location
2.3.2	Type of location passenger terminal, freight terminal, yard, depot
2.3.3	Location, type and identification of fixed signals that protect danger points
2.3.4	Identification and plan of tracks, including switches
2.3.5	Identification of platforms
2.3.6	Length of platforms
2.3.7	Height of platforms
2.3.8	Curvature of platforms
2.3.9	Identification of loops
2.3.10	Other installations
3	<b>Specific Line Segment information</b>
3.1	<b>General Characteristics</b>
3.1.1	Line segment extremity 1
3.1.2	Line segment extremity 2
3.1.3	Lineside indications of distance (frequency, appearance and positioning)
3.1.4	Maximum permissible speed for each track, including, if necessary, differential speeds relating to certain types of train
3.1.5	Any other information the driver shall be aware of

Number	Route Book
3.1.6	Specific geographical information required on the local infrastructure
3.1.7	Means of Communication with the traffic management/control centre in normal, degraded and emergency situation
3.2	<b>Specific Technical Characteristics</b>
3.2.1	Gradient percentage
3.2.2	Gradient location
3.2.3	Tunnels: location, name, length, specific information such as the existence of walkways and points of safe egress as well as the location of safe areas where evacuation of passengers may take place; fire safety categorisation
3.2.4	Non-stopping areas: identification, location, type
3.2.5	Industrial risks — locations where it is dangerous for the driver to step out
3.2.6	Locations of areas designated for testing the sanding equipment (if existing)
3.2.7	Type of signalling system and corresponding operational regime (double track, reversible working, left or right hand running, etc.)
3.2.8	Type of track to train radio equipment.
3.3	<b>Energy subsystem</b>
3.3.1	Energy supply system (voltage and frequency)
3.3.2	Maximum train current
3.3.3	Restriction related to power consumption of specific electric traction unit(s)
3.3.4	Restriction related to the position of Multiple Traction unit(s) to comply with contact line separation (position of pantograph)
3.3.5	Location of neutral sections
3.3.6	Location of areas that shall be passed with lowered pantographs.
3.3.7	Conditions applying with regard to regenerative braking
3.3.8	Maximum current at standstill per pantograph
3.4	<b>Control-Command and Signalling subsystem</b>
3.4.1	Need for more than one system active simultaneously
3.4.2	Special conditions to switch over between different class B train protection, control and warning systems
3.4.3	Special technical conditions required to switch over between ERTMS/ETCS and Class B systems
3.4.4	Special instructions (location) to switch over between different radio systems
3.4.5	Permissibility to use Eddy-current brake
3.4.6	Permissibility to use magnetic brake
3.5	<b>Operation and Traffic Management subsystem</b>
3.5.1	Operating language

*Appendix E***Language and communication level**

The oral qualification in a language may be subdivided into five levels:

Level	Description
5	<ul style="list-style-type: none"><li>— may adapt the way he/she speaks to any interlocutor</li><li>— may put forward an opinion</li><li>— may negotiate</li><li>— may persuade</li><li>— may give advice</li></ul>
4	<ul style="list-style-type: none"><li>— may cope with totally unforeseen situations</li><li>— may make assumptions</li><li>— may express an argued opinion</li></ul>
3	<ul style="list-style-type: none"><li>— may cope with practical situations involving an unforeseen element</li><li>— may describe</li><li>— may keep a simple conversation going</li></ul>
2	<ul style="list-style-type: none"><li>— may cope with simple practical situations</li><li>— may ask questions</li><li>— may answer questions</li></ul>
1	<ul style="list-style-type: none"><li>— may talk using memorised sentences</li></ul>

*Appendix F***Minimum elements relevant to professional qualification for the tasks associated with 'accompanying trains'****1. General requirements**

- (a) This Appendix, which shall be read in conjunction with points 4.6 and 4.7 is a list of the elements that are deemed to be relevant to the tasks associated with accompanying a train on the network.
- (b) The expression 'professional qualification', when taken within the context of this Regulation, refers to those elements that are important to ensure that operational staff are trained and able to understand and discharge the tasks.
- (c) Rules and procedures apply to the tasks being performed and to the person carrying out the tasks. These tasks may be carried out by any authorised qualified person irrespective of any name, job title or grade used in rules or procedures or by the individual company.

**2. Professional knowledge**

Any authorisation requires a successfully passed initial examination and provisions for ongoing assessment and training as described in point 4.6.

**2.1. General professional knowledge**

- (a) Principles of organisation's safety management system, relevant to the tasks.
- (b) Roles and responsibilities of the key players involved in operations.
- (c) General conditions relevant to the safety of passengers or cargo and persons on or about the railway track.
- (d) Conditions of health and safety at work.
- (e) General principles of security of the railway system.
- (f) Personal safety including when leaving the train on the running line.

**2.2. Knowledge of operational procedures and safety systems relevant to the tasks**

- (a) Operational procedures and safety rules.
- (b) Relevant aspects of control command and signalling system.
- (c) Formalised messaging procedure including use of communication equipment.

**2.3. Knowledge of rolling stock**

- (a) Passenger vehicle interior equipment.
- (b) Appropriate knowledge of safety-critical tasks in respect to procedures and interfaces for rolling stock.

**2.4. Knowledge of the route**

- (a) Relevant operational arrangements (such as the method of train despatch) at individual locations (station equipment and signalling etc.).
- (b) Stations at which passengers may alight or board the train.
- (c) Local operating and emergency arrangements specific to the line(s) of route.

**2.5. Knowledge on passenger safety**

The training on passenger safety shall cover at least the following:

- (a) Principles to ensure the safety of passengers:
  - Support Passengers with Reduced Mobility;
  - Identify the hazards;

- Procedures applicable to accidents involving persons;
- Events of a fire and/or smoke;
- Evacuation of passengers.

(b) Principles of communication:

- Identify who needs to be contacted and understand communication methods, especially with the signaller during an evacuation incident;
- Identify causes/situations and requests to initiate communication
- Communication methods for informing passengers;
- Communication methods in degraded operations/emergency situations.

(c) Behavioural skills:

- Situational awareness;
- Conscientiousness;
- Communication;
- Decision making and action.

3. **Ability to put the knowledge into practice**

The ability to apply this knowledge in normal, degraded and emergency situations shall require staff to be fully acquainted with:

- Methods and principles for applying the rules and procedures;
- Process for the use of line-side equipment and rolling stock, as well as any specific safety-related equipment;

In particular with:

- (a) Checks before departure, including brake tests if necessary and correct closure of the doors.
  - (b) Departure procedure.
  - (c) Degraded operation.
  - (d) Assess the potential of a defect within the passenger areas and react according to rules and procedures.
  - (e) Protection and warning measures as required by the rules and regulations or in assistance to the driver.
  - (f) Communicate with the infrastructure manager's staff when assisting the driver.
  - (g) Report any unusual occurrences concerning the operation of the train, the condition of the rolling stock and the safety of passengers. If required these reports shall be made in writing, in the language chosen by the railway undertaking.
-

*Appendix G***Minimum elements relevant to professional qualification for the task of preparing trains****1. General requirements**

- (a) This Appendix, which shall be read in conjunction with point 4.6, gives a list of the elements that are deemed to be relevant to the task of preparing a train on the network.
- (b) The expression 'professional qualification', when taken within the context of this Regulation, refers to those elements that are important to ensure that operational staff are trained and able to understand and discharge the elements of the task.
- (c) Rules and procedures apply to the task being performed and to the person carrying out the task. These tasks may be carried out by any authorised qualified person irrespective of any name, job title or grade used in rules or procedures or by the individual company.

**2. Professional knowledge**

Any authorisation requires a successfully passed initial examination and provisions for ongoing assessment and training as described in point 4.6.

**2.1. General professional knowledge**

- (a) Principles of organisation's safety management system, relevant to the task.
- (b) Roles and responsibilities of the key players involved in operations.
- (c) General conditions relevant to the safety of passengers and/or cargo including the carriage of dangerous goods and exceptional loads.
- (d) Appreciation of hazards, especially in relation to the risks involving railway operation and electric traction supply.
- (e) Conditions of health and safety at work.
- (f) General principles of security of the railway system.
- (g) Personal safety when on or in the vicinity of rail lines.
- (h) Communications principles and formalised messaging procedure including use of communication equipment.

**2.2. Knowledge of operational procedures and safety systems relevant to the task**

- (a) Working of trains in normal, degraded and emergency situations.
- (b) Operational procedures at individual locations (signalling, station/depot/yard equipment) and safety rules.
- (c) Local operating arrangements.

**2.3. Knowledge of train equipment**

- (a) Purpose and use of wagon and vehicle equipment.
- (b) Identification of and arranging for technical inspections.
- (c) Appropriate knowledge of safety-critical tasks in respect to procedures and interfaces for rolling stock.

**3. Ability to put the knowledge into practice**

The ability to apply this knowledge in normal, degraded and emergency situations shall require staff to be fully acquainted with:

- Methods and principles for applying the rules and procedures;
- Process for the use of line-side equipment and rolling stock, as well as any specific safety-related equipment;



In particular:

- (a) Application of train composition rules, train braking rules, train loading rules etc. to ensure the train is in running order.
  - (b) Understanding of marking and labels on vehicles.
  - (c) Process for determining and making train data available.
  - (d) Communication with train crew.
  - (e) Communication with staff responsible for controlling the movement of trains.
  - (f) Degraded operations especially as it affects the preparation of trains.
  - (g) Protection and warning measures as required by the rules and regulations or local arrangements at the location in question.
  - (h) Actions to be taken in respect to incidents involving the carriage of dangerous goods (where relevant).
-

## Appendix H

**European Vehicle Number and linked alphabetical marking on the bodywork**

## 1. GENERAL PROVISIONS ON THE EUROPEAN VEHICLE NUMBER

The European Vehicle Number (EVN) is assigned in accordance with Appendix 6 of Annex II to Commission Implementing Decision (EU) 2018/1614 <sup>(1)</sup>.

The EVN shall be changed in accordance with point 3.2.2.8 of Annex II to Implementing Decision (EU) 2018/1614.

The EVN may be changed at the request of the keeper in accordance with point 3.2.2.9 of Annex II to Implementing Decision (EU) 2018/1614.

## 2. GENERAL ARRANGEMENTS FOR EXTERNAL MARKINGS

The capital letters and figures making up the marking inscriptions shall be at least 80 mm in height, in a sans serif font type of correspondence quality. A smaller height may only be used where there is no option but to place the marking on the sole bars.

The marking is put not higher than 2 metres above rail level.

The keeper may add, in letters of larger size than the European Vehicle Number, an own number marking (consisting generally of digits of the serial number supplemented by alphabetical coding) useful in operations. The place where the own number is marked is left to the choice of the keeper, however it shall be always be possible to distinguish easily the European Vehicle Number from the keeper's own number marking.

## 3. WAGONS

The marking shall be inscribed on the wagon bodywork in the following manner:

23. TEN	31. TEN	33. TEN
80 D-RFC	80 D-DB	84 NL-ACTS
7369 553-4	0691 235-2	4796 100-8
Zcs	Tanoos	Slpss

Where in the examples:

D and NL stand for the registering Member State as set out in Decision (EU) 2018/1614, Appendix 6, part 4.

RFC, DB and ACTS stand for the keeper marking as set out in Decision (EU) 2018/1614, Appendix 6, part 1.

For wagons whose bodywork does not offer a large enough area for this type of arrangement, particularly in the case of flat wagons, the marking shall be arranged as follows:

01 87	3320 644-7	
TEN	F-SNCF	Ks

When one or more index letters of national significance are inscribed on a wagon, this national marking shall be shown after the international letter marking and separated from it by a hyphen as follows:

01 87	3320 644-7	
TEN	F-SNCF	Ks-xy

## 4. COACHES AND HAULED PASSENGER STOCK

The number shall be applied to each sidewall of the vehicle in the following manner:

F-SNCF	61 87 <u>20 - 72 021</u> - 7
	B <sup>10</sup> tu

<sup>(1)</sup> Commission Implementing Decision (EU) 2018/1614 of 25 October 2018 laying down specifications for the vehicle registers referred to in Article 47 of Directive (EU) 2016/797 of the European Parliament and of the Council and amending and repealing Commission Decision 2007/756/EC (OJ L 268, 26.10.2018, p. 53).

The marking of the country in which the vehicle is registered and of the technical characteristics are printed directly in front of, behind or under the twelve digits of the vehicle number.

In case of coaches with driver's cabin, the European Vehicle Number is also written inside the cabin.

#### 5. LOCOMOTIVES, POWER CARS AND SPECIAL VEHICLES

The European Vehicle Number shall be marked on each sidewall of the tractive stock in the following manner:

92 10 1108 062-6

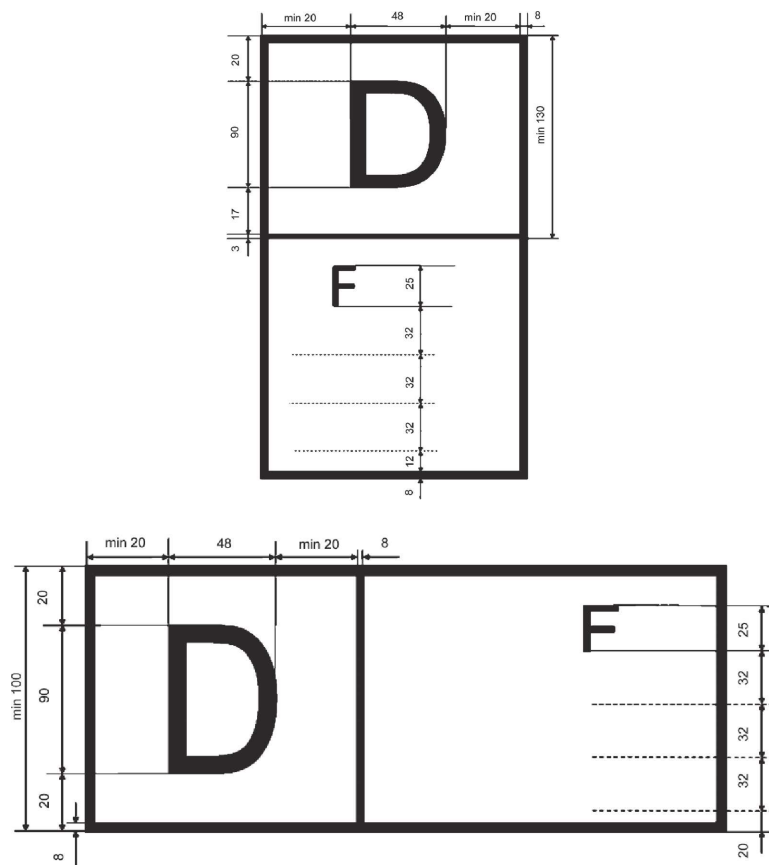
The European Vehicle Number is also written inside each cabin of the tractive rolling stock.

#### 6. ALPHABETICAL MARKING OF THE INTEROPERABILITY CAPABILITY

'TEN': Vehicle which is provided with an authorisation valid for an area of use covering all Member States.

'PPV/PPW': Vehicle which complies with PPV/PPW or PGW agreement (inside OSJD States). (original: PPV/PPW: ППВ (Правила пользования вагонами в международном сообщении); PGW: Правила Пользования Грузовыми Вагонами)

Vehicles which are provided with an authorisation valid for an area of use which does not cover all Member States need a marking indicating the Member States which are part of the area of use of the vehicle. This marking shall be according to one of the following drawings, where D stands for the Member State who has granted the first authorisation (in the given example, Germany) and F stands for the second authorising MS (in the given example, France). The MS are codified in accordance with Decision (EU) 2018/1614, Appendix 6, part 4.



*Appendix I***List of areas for which national rules may continue to apply according to Article 8 of Directive (EU) 2016/798**

## 1. AREAS FOR NATIONAL RULES

**Shunting****Signalling rules**

Rules related to the operational use of the national signalling system

**Maximum speeds in degraded mode including running on sight****Running at caution****Local operational rule**

Relating to specific local conditions where additional information may be needed — this is limited to requirements not covered by this Regulation

**Operation during works****Safe operation of test train****Train visibility — Front end (see 4.2.2.1.2)**

Existing Non TSI conform vehicles

**Managing an emergency situation and emergency responses (see point 4.2.3.7)**

Role of local/national authorities and emergency services

Notification of accidents and incidents: national instructions on modalities for notifications to authorities

**Safety-related communications terminology (see Appendix C)**

National operational instructions

**Requirements on route knowledge under the national transposition of Directive 2007/59/EC (Train Driver Directive)**

## 2. LIST OF OPEN POINTS

**Exceptional transport****Timetable (see 4.2.1.2.3)**

Additional information

**Recording of supervision data outside the train (see 4.2.3.5.1)**

Additional information

**Recording of supervision data on-board the train (see 4.2.3.5.2)**

Additional information

**Professional competences (see point 4.6)**

— Staff with safety critical tasks other than train drivers;

— Additional information for staff undertaking the safety critical tasks associated with accompanying a train other than train driver;

— Additional information for staff undertaking the safety critical tasks associated with the last preparation of a train before it is scheduled to cross a border and work beyond any location(s) designated as the 'frontier' in the network statement of an infrastructure manager and included in its safety authorization.

**Health and safety conditions (see point 4.7)**

- Staff with safety critical tasks other than train drivers;
- Additional information for staff undertaking the safety critical tasks associated with accompanying a train other than train driver;
- Alcohol limits (see 4.7.1).

**Common operational principles and rules (See 4.4 and Appendix B)**

- Sanding — automatic sanding equipment and report in case of use of the sanding equipment;
- Failure of level crossing — additional information;

**Safety-related communications terminology (see Appendix C)**

Additional terms

**Operations in long tunnels (see 4.3.5)**

Additional information

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## Appendix J

**Glossary**

The definitions in this glossary refer to the use of terms in this Regulation.

For the purpose of this Regulation, the definition in Article 2 of Directive (EU) 2016/797 and in point 2.2 of Locomotives and passenger rolling stock TSI shall apply.

Term	Definition
Accident	As defined in Article 3 of Directive (EU) 2016/798.
Authorising train movements	The operation of equipment in signalling centres, electric traction current supply control rooms and traffic control centres that permits train movement. This does not include those staff employed by a railway undertaking who are responsible for management of resources such as train crew or rolling stock.
Competence	The qualification and experience necessary to safely and reliably undertake the task being performed. Experience may be gained as part of the training process.
Dangerous goods	As covered by Directive 2008/68/EC of the European Parliament and of the Council on the inland transport of dangerous goods (1)
Degraded operation	Operation resulting from an unplanned event that prevents the normal delivery of train services.
Despatch (= dispatch)	See Train despatch
Driver	As defined in Article 3 of Directive 2007/59/EC.
Emergency call	Call set up in some dangerous situations to warn all trains/shunting movements in a defined area.
End of authority passed without permission	<p>An end of authority passed without permission is any occasion when a train proceeds beyond the end of authority in the following circumstances:</p> <ul style="list-style-type: none"> <li>— A trackside signal at danger, or an order to STOP where an ATP is not operational,</li> <li>— The end of a movement authority provided in an ATP,</li> <li>— A point communicated by verbal or written authorisation laid down in regulations,</li> <li>— Stop boards,</li> <li>— Hand signals.</li> </ul> <p>This covers movement authority as described in ETCS and authority to move covered by instructions/signalling.</p> <p>Any case in which a vehicle without any traction unit attached or a train that is unattended runs away is not included.</p>
European instruction	An harmonised operational instruction giving a similar content to train drivers across the European Union in order for them to answer in a similar manner to similar situation.
Evacuation	Evacuation of a train is when all passengers are instructed to leave the train and go on to the infrastructure under the supervision of on-board staff. On-board staff having agreed with the signaller or other responsible infrastructure manager staff, that it is safe to do so.

Term	Definition
Exceptional transport	A vehicle and/or the load carried which because of construction/design, dimensions or weight does not meet the parameters of the route and requires special authority for the movement and may require special conditions over part or its entire journey.
Health and Safety Conditions	In the context of this Regulation, this refers only to the medical and psychological qualifications required to operate the relevant elements of the subsystem.
Hot axle box	An axle box and bearing that has exceeded its maximum designed operating temperature.
Incident	As defined in Article 3 of Directive (EU) 2016/798.
Length of train	Total length of all vehicles over buffers including locomotive(s)
Loop	Track, connected to the main track, used for passing, crossing and stabling.
National instruction	An instruction defined at national level or by an infrastructure manager which covers situations specific to a Class B system or the transition between class A and class B systems.
Operating Language	The language or languages used in daily operation an infrastructure manager and published in its Network Statement, for the communication of operational or safety related messages between the staff of the infrastructure manager and the railway undertaking.
Operational instruction	Formal information exchanged between signaller and train driver so as to ensure/continue railway operation in specific situations. The operational instruction exists at both national and European levels.
Passenger	Person (other than an employee with specific duties on the train) travelling by train or on railway property before or after a train journey.
Performance monitoring	The systematic observation and recording of the performance of the train service and the infrastructure for the purpose of bringing about improvements in the performance of both.
Qualification	The physical and psychological suitability for the task together with the required knowledge.
Real time	The ability to exchange or process information on specified events (such as arrival at a station, passing a station or departure from a station) on the trains journey as they occur.
Reporting point	A point on the trains schedule where reporting of the arrival, departure or passing time is required.
Route	The particular section or sections of line
Safety-critical task	Task performed by staff when they control or affect the movement of a train, which could affect railway safety.
Scheduled stop	Planned stop for commercial or operational reasons.
Siding	Any track(s) within an operational point which is not used for operational routing of a train.
Signaller	Performer in charge of the route setting of trains/shunting movements and of issuing instructions to drivers.
Staff	Employees working for a railway undertaking or an infrastructure manager, or their contractors, undertaking tasks as specified in this Regulation.

Term	Definition
Stop aspect	Any signal aspect that does not allow the driver to pass the signal.
Stopping point	A location identified in the schedule of a train where the train is planned to stop, usually to carry out a specific activity such as allowing passengers to join and leave the train.
Timetable	Document or system that gives details of a train(s) schedule over a particular route.
Timing point	A location identified in the schedule of a train where a specific time is identified. This time may be an arrival time, departure time or in the case of a train not scheduled to stop at that location the passing time.
Traction unit	A powered vehicle able to move itself and other vehicles to which it may be coupled.
Train	A train is defined as (a) traction unit(s) with or without coupled railway vehicles with train data available operating between two or more defined points.
Train despatch	The indication to the person driving the train that all station or depot activities are completed and that, as far as the staff responsible are concerned, movement authority has been granted for the train.
Train crew	Members of the on-board staff of a train, who are certified as competent and appointed by a railway undertaking to carry out specific, designated safety related tasks on the train, for example the driver or the guard.
Train preparation	Ensuring that a train is in a fit condition to enter service, that the train equipment is correctly deployed and the train composition matches the train's designated route(s). Train preparation also includes technical inspections carried out prior to the train entering service.

(<sup>1</sup>) Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods (OJ L 260, 30.9.2008, p. 13).

Abbreviation	Explanation
AC	Alternating current
ATP	Automatic Train Protection
CCS	Control-Command and Signalling
CEN	European Committee for Standardisation (Comité Européen de Normalisation)
COTIF	Convention Concerning International Carriage by Rail (Convention relative aux Transports Internationaux Ferroviaires)
dB	Decibels
DC	Direct Current
DMI	Driver Machine Interface
EC	European Community
ECG	Electro Cardiogram
EIRENE	European Integrated Railway Radio Enhanced Network
EN	Euro-norm



Abbreviation	Explanation
ENE	Energy
ERA	European Union Agency for Railways
ERATV	European Register of Authorised Types of Vehicles
ERTMS	European Rail Traffic Management System
ETCS	European Train Control System
EU	European Union
FRS	Functional Requirement Specification
GSM-R	Global System for Mobile Communications — Rail
IM	Infrastructure Manager
INF	Infrastructure
OPE	Operation and Traffic Management
OSJD	Organisation for Cooperation between Railways
PPV/PPW	Russian abbreviation for <i>Prawila Polzowaniiia Wagonami w mejdunarodnom soobqenii</i> = Rules for use of railway vehicles in international traffic
RINF	Register of Infrastructure
RST	Rolling Stock
RU	Railway Undertaking
SMS	Safety Management System
SPAD	Signal Passed at Danger
SRS	System Requirement Specification
TAF	Telematic Applications for Freight
TEN	Trans-European Network
TPS	Train Protection System
TSI	Technical Specification for Interoperability
UIC	International Union of Railways (Union Internationale des Chemins de fer)
Locomotives and passenger rolling stock (LOC&PAS) TSI	Commission Regulation (EU) No 1302/2014 of 18 November 2014 concerning a technical specification for interoperability relating to the 'rolling stock — locomotives and passenger rolling stock' subsystem of the rail system in the European Union

Abbreviation	Explanation
Control-command and signalling (CCS) TSI	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
Noise (NOI) TSI	Commission Regulation (EU) No 1304/2014 of 26 November 2014 on the technical specification for interoperability relating to the subsystem 'rolling stock — noise' amending Decision 2008/232/EC and repealing Decision 2011/229/EU
Wagon (WAG) TSI	Commission Regulation (EU) No 321/2013 of 13 March 2013 concerning the technical specification for interoperability relating to the subsystem 'rolling stock — freight wagons' of the rail system in the European Union and repealing Decision 2006/861/EC
Persons with reduced mobility (PRM) TSI	Commission Regulation (EU) No 1300/2014 of 18 November 2014 on the technical specifications for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility
Energy (ENE) TSI	Commission Regulation (EU) No 1301/2014 of 18 November 2014 on the technical specifications for interoperability relating to the 'energy' subsystem of the rail system in the Union
Infrastructure (INF) TSI	Commission Regulation (EU) No 1299/2014 of 18 November 2014 on the technical specifications for interoperability relating to the 'infrastructure' subsystem of the rail system in the European Union
Safety in Railway Tunnels (SRT) TSI	Commission Regulation (EU) No 1303/2014 of 18 November 2014 concerning the technical specification for interoperability relating to 'safety in railway tunnels' of the rail system of the European Union

**COMMISSION IMPLEMENTING REGULATION (EU) 2019/774****of 16 May 2019****amending Regulation (EU) No 1304/2014 as regards application of the technical specification for interoperability relating to the subsystem 'rolling stock — noise' to the existing freight wagons****(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 Union <sup>(1)</sup>, and in particular Article 5(11) thereof,

Whereas:

- (1) Directive 2002/49/EC of the European Parliament and of the Council <sup>(2)</sup> (Environmental Noise Directive) provides a basis for developing and completing the existing set of Community measures concerning noise emitted by, inter alia, rail vehicles.
- (2) Environmental noise and in particular noise from railways remains a serious threat to human health, as results from the evaluation of the Environmental Noise Directive <sup>(3)</sup> and the implementation report of the Environmental Noise Directive <sup>(4)</sup>.
- (3) While Environmental Noise Directive generally applies to routes having more than 30 000 trains, both freight and passenger, in developing the concept of 'quieter routes' it has been necessary to take into account those routes where there is a significant freight traffic during the night-time.
- (4) There is a risk that excessive levels of railway noise could lead to uncoordinated unilateral action by some Member States. Such measures could have adverse effects on European economies and result in a reverse modal shift from rail to road. Furthermore, such actions might undermine Union rail interoperability. As the majority of rail freight in the Union is international, a European-level solution to the problem is needed.
- (5) The application of the technical specification for interoperability relating to the 'rolling stock — noise' subsystem of the rail system in the Union ('NOI TSI') as set out in Commission Regulation (EU) No 1304/2014 <sup>(5)</sup> to existing wagons should therefore significantly reduce maximum noise emission levels. One of the most effective ways to mitigate rail noise is by retrofitting existing freight wagons with composite brake blocks. This technical solution reduces rail noise by up to 10 dB, which represents a 50 % reduction in audible noise for humans.
- (6) On 22 September 2017, the Commission requested the European Union Agency for Railways ('the Agency') to issue a recommendation, pursuant to Article 5(2) of Directive (EU) 2016/797, for a revision of the NOI TSI with a view to specifying the application of the NOI TSI to the existing freight wagons in the framework of the 'quieter routes' strategy and in order to align the NOI TSI with Directive (EU) 2016/797.
- (7) The issue of rail freight noise should be tackled where it is a serious nuisance and a health threat. For this reason and as freight trains operating in night are of particular nuisance, a definition of a quieter route should be formulated with reference to rail freight traffic intensity during night-time.

<sup>(1)</sup> 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 Union (OJ L 138, 26.5.2016, p. 44).

<sup>(2)</sup> Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise (OJ L 189, 18.7.2002, p. 12).

<sup>(3)</sup> Commission Staff Working Document Refit Evaluation of the Directive 2002/49/EC relating to the assessment and management of environmental noise (SWD(2016) 454 final)

<sup>(4)</sup> Report from the Commission to the European Parliament and the Council on the Implementation of the Environmental Noise Directive in accordance with Article 11 of Directive 2002/49/EC (COM(2017) 151 final).

<sup>(5)</sup> Commission Regulation (EU) No 1304/2014 of 26 November 2014 on the technical specification for interoperability relating to the subsystem 'rolling stock — noise' amending Decision 2008/232/EC and repealing Decision 2011/229/EU (OJ L 356, 12.12.2014, p. 421).

- (8) The date of application of the introduction of the quieter routes should be set taking into account several parameters, including the progress of retrofitting in different Member States, the rate of renewal of the rail freight fleet, the freight wagons maintenance cycle, the production capacity of manufacturers of composite brake blocks and workshop availability. The date should also be aligned with the recurrent change of working timetable in accordance with Annex VII to Directive 2012/34/EU of the European Parliament and of the Council <sup>(6)</sup>.
- (9) As traffic intensity may be subject to fluctuations, the list of quieter routes should be updated at regular intervals to take into account such changes and, at the same time, guarantee a stable framework over a period of several years. Therefore, it would be appropriate that the Member States update the list of quieter routes at least every five years after 8 December 2024. Furthermore, before the first update, the Commission should evaluate the progress of retrofitting and the impact of the introduction of quieter routes on the rail freight industry.
- (10) Given the concerns raised by some stakeholders related to the operations of wagons equipped with composite brake blocks in Nordic winter conditions, the Commission, assisted by the Agency, should continue to analyse the issues and possible solutions. It should assess by June 2020 whether an amendment to this TSI is necessary, possibly in form of an exemption allowing the continued operation of limited numbers of wagons with cast iron brake blocks on quieter routes, to preserve cross border rail freight traffic to and from affected Nordic regions. According to the estimates of the Swedish authorities the number of wagons used in such a traffic does in total not exceed 17 500.
- (11) The introduction of quieter routes should complement other actions at Union level aimed at reducing rail freight noise, including the financing of retrofitting under the Connecting Europe Facility, <sup>(7)</sup> ESIF funds <sup>(8)</sup>, noise-differentiated track access charges schemes <sup>(9)</sup> and the development of new technical solutions under the Shift2Rail initiative <sup>(10)</sup>.
- (12) In order to ensure an efficient implementation of quieter routes the respective national competent authorities should closely cooperate.
- (13) As the amendments have a direct impact on the social environment of workers in the sector and on rail freight customers, the social partners and rail freight customers have been consulted, as required by Articles 6 and 7 of Regulation (EU) 2016/796 of the European Parliament and of the Council <sup>(11)</sup>.
- (14) An impact assessment in accordance with Article 5 of Directive (EU) 2016/797 was conducted during the revision of this TSI by the Agency.
- (15) On 29 May 2018, the Agency issued a recommendation on the amendments to the NOI TSI regarding the application of its provisions to the existing wagons.
- (16) Furthermore, on 29 November 2018, the Agency issued a recommendation on the amendment to the NOI TSI in order to align this Regulation with Directive (EU) 2016/797.
- (17) Under Commission Delegated Decision (EU) 2017/1474 <sup>(12)</sup>, TSI should indicate whether it is necessary to re-notify the conformity assessment bodies that were notified on the basis of a previous version of the TSI and whether a simplified notification process should be applied. This Regulation brings about limited changes and it should not be necessary to re-notify bodies notified on the basis of a previous version of the TSI.

<sup>(6)</sup> Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area (OJ L 343, 14.12.2012, p. 32).

<sup>(7)</sup> Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010 (OJ L 348, 20.12.2013, p. 129).

<sup>(8)</sup> Regulation (EU) No 1300/2013 of the European Parliament and of the Council of 17 December 2013 on the Cohesion Fund and repealing Council Regulation (EC) No 1084/2006 (OJ L 347, 20.12.2013, p. 281) and Regulation (EU) No 1301/2013 of the European Parliament and of the Council of 17 December 2013 on the European Regional Development Fund and on specific provisions concerning the Investment for growth and jobs goal and repealing Regulation (EC) No 1080/2006 (OJ L 347, 20.12.2013, p. 289).

<sup>(9)</sup> Commission Implementing Regulation (EU) 2015/429 of 13 March 2015 setting out the modalities to be followed for the application of the charging for the cost of noise effects (OJ L 70, 14.3.2015, p. 36).

<sup>(10)</sup> Council Regulation (EU) No 642/2014 of 16 June 2014 establishing the Shift2Rail Joint Undertaking (OJ L 177, 17.6.2014, p. 9).

<sup>(11)</sup> 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 881/2004 (OJ L 138, 26.5.2016, p. 1).

<sup>(12)</sup> 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).

- (18) This Regulation amends the NOI TSI to further achieve interoperability within the Union rail system, improve and develop international rail transport, contribute to the progressive creation of the internal market and complement the NOI TSI in view of covering essential requirements. It enables to achieve the objectives and to meet the essential requirements of both Directives 2008/57/EC of the European Parliament and of the Council <sup>(13)</sup> and (EU) 2016/797. Therefore, this Regulation should be directly applicable in all Member States including Member States which have notified the Agency and the Commission under Article 57(2) of Directive (EU) 2016/797 that they have extended the transposition period and thus continue to apply Directive 2008/57/EC until 15 June 2020 at the latest. Notified Bodies exercising under Directive 2008/57/EC in the Member States that have extended the transposition period should be able to issue 'EC' certificate of verification in accordance with this Regulation as long as Directive 2008/57/EC applies in the Member State where they are established.
- (19) Regulation (EU) No 1304/2014 should therefore be amended in order to align this Regulation with Directive (EU) 2016/797 and to apply it to existing freight wagons in the framework of the quieter routes strategy and to provide for a procedure for the assessment of acoustic performance of composite brake blocks. This procedure should become as set out by this amendment an open point within the meaning of Article 4(6) of Directive (EU) 2016/797.
- (20) The measures provided for in this Regulation are in accordance with the opinion of the Committee established under Article 51(1) of Directive (EU) 2016/797,

HAS ADOPTED THIS REGULATION:

#### Article 1

Regulation (EU) No 1304/2014 is amended as follows:

(1) Article 5 is amended as follows:

(a) paragraph 1 is replaced by the following:

'1. With regard to specific cases listed in point 7.3.2 of the Annex, 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 7.3.2 of the Annex or by national rules in force in the Member State which is part of the area of use of the vehicles covered by this Regulation';

(b) point (c) of paragraph 2 is replaced by the following:

'(c) the bodies designated to carry out the conformity assessment and verification procedures with respect to the national rules relating to the specific cases set out in point 7.3.2 of the Annex';

(2) Article 7 is amended as follows:

(a) in paragraph 4, the reference to 'Article 6 of Directive 2008/57/EC' is replaced by a reference to 'Article 5 of Directive (EU) 2016/797';

(b) in paragraph 5, the reference to 'Directive 2008/57/EC' is replaced by a reference to 'Directive (EU) 2016/797';

(3) The following Articles 5a, 5b, 5c, 5d, 5e are inserted:

##### 'Article 5a

From 8 December 2024, wagons within the scope of Regulation (EU) No 321/2013 which are not covered by point 7.2.2.2 of the Annex to this Regulation shall not be operated on the quieter routes.

##### Article 5b

A 'quieter route' means a part of the railway infrastructure with a minimum length of 20 km on which the average number of daily operated freight trains during the night-time as defined in national legislation transposing Directive 2002/49/EC of the European Parliament and of the Council (\*) was higher than 12. The freight traffic in the

<sup>(13)</sup> Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community (OJ L 191, 18.7.2008, p. 1)

years 2015, 2016 and 2017 shall be the basis for the calculation of that average number. In case the freight traffic due to exceptional circumstances diverges in a given year from that average number by more than 25 %, the Member State concerned can calculate the average number on the basis of the remaining two years.

#### Article 5c

1. Member States shall designate quieter routes in accordance with Article 5b and the procedure set out in Appendix D.1 of the Annex. They shall provide the European Union Agency for Railways (‘the Agency’) with a list of quieter routes six months after the date of publication of this Regulation at the latest. The Agency shall publish those lists on its website.

2. Member States shall update the list of quieter routes at least every five years after 8 December 2024, following the procedure set out in Appendix D.2 of the Annex.

#### Article 5d

By 31 December 2028, the Commission shall evaluate the implementation of the quieter routes, in particular regarding the progress of retrofitting of wagons and the impact of the introduction of quieter routes on the overall noise exposure of the population and competitiveness of the rail freight sector.

#### Article 5e

By 30 June 2020, the Commission shall issue a report regarding operations with wagons equipped with composite brake blocks in Nordic winter conditions, based on evidence gathered by the Agency, national safety authorities and rail companies. In particular, this report shall contain an assessment of the safety and braking performance of such wagons and existing or potential operational and technical measures applicable in Nordic winter conditions. The report shall be made public.

If the report provides evidence that the use of such wagons in Nordic winter conditions poses safety issues that cannot be addressed by operational and technical measures without severe adverse impact on rail freight operations, the Commission shall propose amendments to this TSI to address those issues while preserving cross border freight traffic to and from affected Nordic regions. In particular, the proposal may if necessary include an exemption permitting the continued operation on quieter routes throughout the Union of a limited number of wagons used frequently in such cross border freight traffic, and any operational restrictions appropriate to limit the impact of the use of such wagons on quieter routes, which are compatible with the purpose of preserving the above-mentioned cross-border freight traffic.

If the revision set out in the paragraph above takes place, the Commission shall report annually thereafter on the progress on technical and operational solutions for the operation of freight wagons in winter conditions. It shall provide an estimation of the number of wagons equipped with cast iron brake blocks necessary to ensure continued cross border traffic to and from such Nordic regions, with a view to ending the exemption in 2028 at the latest.

(\*) Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise (OJ L 189, 18.7.2002, p. 12).’

(4) The Annex to Regulation (EU) No 1304/2014 is amended in accordance with the Annex to this Implementing Regulation.

#### Article 2

1. Notifications of conformity assessment bodies for the purposes of Regulation (EU) No 1304/2014 shall remain valid on the basis of that Regulation, as amended by the present Regulation.

2. Conformity assessment bodies notified in accordance with Directive 2008/57/EC may issue ‘EC’ certificate of verification in accordance with this Regulation as long as Directive 2008/57/EC applies in the Member State where they are established in accordance with Article 57(2) of Directive (EU) 2016/797 and until 15 June 2020 at the latest.

#### Article 3

This Regulation shall enter into force on the twentieth 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, 16 May 2019.

*For the Commission*  
*The President*  
Jean-Claude JUNCKER

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## ANNEX

The Annex to Regulation (EU) No 1304/2014 is amended as follows:

1. In Chapter 1 the text 'Directive 2008/57/EC' is replaced by the text 'Directive (EU) 2016/797';
2. In chapter 1 section 1.1 is replaced by the following:

**1.1 Technical scope**

1.1.1 *Scope related to rolling stock*

This TSI applies to all rolling stock within the scope of Regulation (EU) No 1302/2014 (LOC&PAS TSI) and Regulation (EU) No 321/2013 (WAG TSI);

1.1.2. *Scope related to operational aspects*

Alongside with Commission Decision 2012/757/EU (\*) (OPE TSI), this TSI applies to the operation of freight wagons which are used on railway infrastructure designated as 'quieter routes'.

(\*) Commission Decision 2012/757/EU of 14 November 2012 concerning the technical specification for interoperability relating to the operation and traffic management subsystem of the rail system in the European Union and amending Decision 2007/756/EC (OJ L 345, 15.12.2012, p. 1).'

3. Chapter 2 is replaced by the following:

**2. DEFINITION OF THE SUBSYSTEM**

A 'unit' means the rolling stock which is subject to the application of this TSI, and therefore subject to the 'EC' verification procedure. Chapter 2 in the annex to Regulation (EU) No 1302/2014 and chapter 2 in the annex to Regulation (EU) No 321/2013 describe what a unit can consist of.

The requirements of this TSI apply to the following categories of rolling stock set out in section 2 in Annex I of Directive (EU) 2016/797:

- (a) Locomotives and passenger rolling stock including thermal or electric traction units, self-propelling thermal or electric passenger trains, and passenger coaches. This category is further defined in chapter 2 in the annex to Regulation (EU) No 1302/2014 and shall be referred to in this TSI as locomotives, electric multiple units (EMU), diesel multiple units (DMU) and coaches;
- (b) Freight wagons, including low-deck vehicles designed for the entire network and vehicles designed to carry lorries. This category is further defined in chapter 2 in the annex to Regulation (EU) No 321/2013 and shall be referred to in this TSI as wagons;
- (c) Special vehicles, such as on-track machines. This category is further defined in chapter 2 in the annex to Regulation (EU) No 1302/2014 and consists of on-track machines (referred to in this TSI as OTMs) and infrastructure inspection vehicles, which belong to the categories in points (a) or (b) depending on their design.;

4. Chapter 3 is replaced by the following:

**3. ESSENTIAL REQUIREMENTS**

All basic parameters set out in this TSI shall be linked to at least one of the essential requirements as set out in Annex III of Directive (EU) 2016/797. Table 1 indicates the allocation.

Table 1

**Basic parameters and their link to the essential requirements**

Point	Basic parameter	Essential requirements					
		Safety	Reliability and availability	Health	Environmental protection	Technical compatibility	Accessibility
4.2.1	Limits for stationary noise				1.4.4		



Point	Basic parameter	Essential requirements					
		Safety	Reliability and availability	Health	Environmental protection	Technical compatibility	Accessibility
4.2.2	Limits for starting noise				1.4.4		
4.2.3	Limits for pass-by noise				1.4.4		
4.2.4	Limits for driver's cab interior noise				1.4.4'		

5. Chapter 4 is amended as follows:

- (a) in section 4.2 the reference to 'Articles 5(5) and 2(l) of Directive 2008/57/EC' is replaced by the reference to 'Articles 4(5) and 2(13) of Directive (EU) 2016/797';
- (b) section 4.3 is replaced by the following:

#### '4.3 Functional and technical specifications of the interfaces

This TSI has the following interfaces with the rolling stock subsystem:

Interface with subsystems of points (a), (b), (c) and (e) of chapter 2 (dealt with in Regulation (EU) No 1302/2014) with regard to:

- stationary noise,
- starting noise (not applicable to coaches),
- pass-by noise,
- interior noise within the driver's cab, where applicable.

Interface with subsystems of point (d) of chapter 2 (dealt with in Regulation (EU) No 321/2013) with regard to:

- pass-by noise,
- stationary noise.

This TSI has the following interface with the operation and traffic management subsystem (dealt with in Decision 2012/757/EU) with regard to:

- pass-by noise.;

- (c) section 4.4 is replaced by the following:

#### '4.4 Operating rules

Requirements concerning the operating rules for the subsystem rolling stock are set out in section 4.4 of the Annex of Regulation (EU) No 1302/2014 and in section 4.4 of the Annex of Regulation (EU) No 321/2013.

##### 4.4.1 *Specific rules for the operation of wagons on quieter routes in case of degraded operation*

The contingency arrangements as defined in point 4.2.3.6.3 of the Annex of Decision 2012/757/EU include the operation of wagons not compliant with point 7.2.2.2 on quieter routes.

This measure can be applied to address capacity restrictions or operational constraints caused by rolling stock failures, extreme weather conditions, accidents or incidents and infrastructure failures.

#### 4.4.2 *Specific rules for the operation of wagons on quieter routes in case of infrastructure works and wagons maintenance*

The operation of wagons not compliant with point 7.2.2.2 on quieter routes shall be possible in case of wagons maintenance activities where only a quieter route is available in order to access the maintenance workshop.

Contingency arrangements set out in point 4.4.1 are applicable in case of infrastructure works where a quieter route is the only suitable alternative.'

(d) section 4.5 is replaced by the following:

#### '4.5 **Maintenance rules**

Requirements concerning the maintenance rules for the subsystem rolling stock are set out in section 4.5 of the Annex of Regulation (EU) No 1302/2014 and in section 4.5 of the Annex of Regulation (EU) No 321/2013;'

6. In chapter 6 'Conformity assessment and EC verification', in point 6.2.2.3.2.1 'EMU, DMUs, locomotives and coaches' and in point 6.2.2.3.2.2 'Wagons', the text ' $v_{\text{test}}$ ' is replaced by ' $v_{\text{test}}$ ' (four replacements).

7. Chapter 7 is amended as follows:

(a) section 7.2 is replaced by the following:

#### '7.2 **Application of this TSI to existing subsystems**

The principles to be applied by the applicants and authorising entities in case of change(s) to an existing rolling stock or rolling stock type are defined in point 7.1.2 of the Annex to Regulation (EU) No 1302/2014 and section 7.2 of the Annex to Regulation (EU) No 321/2013.

##### 7.2.1 *Provisions in case of changes to existing rolling stock or rolling stock type*

The applicant shall ensure that the noise levels of rolling stock subject to change(s) remain below the limits set out in the TSI, which was applicable when the rolling stock in question was first authorised. If no TSI existed at the time of the first authorisation, the applicant shall ensure that the noise levels of the rolling stock subject to change(s) are either not increased or remain below the limits set out in Decision 2006/66/EC or Decision 2002/735/EC.

If an assessment is required, it shall be limited to the basic parameters affected by the change(s).

If the simplified evaluation is applied, the original unit may represent the reference unit in accordance with the provisions of point 6.2.3.

The replacement of a whole unit or (a) vehicle(s) within a unit (e.g. a replacement after a severe damage) does not require a conformity assessment against this TSI, as long as the unit or the vehicle(s) are identical to the ones they replace.

##### 7.2.2 *Additional provisions for the application of this TSI to existing wagons*

The restriction of the operation set out in Article 5a of this Regulation shall not apply to wagons mostly operated on lines with a gradient of more than 40 ‰, wagons with a maximum operating speed higher than 120 km/h, wagons with a maximum axle load higher than 22,5 t, wagons exclusively operated for infrastructure works and wagons used in rescue trains.

If a wagon is being equipped with quieter brake blocks as defined in point 7.2.2.1 and no noise sources are added to the wagon, then it shall be assumed that the requirements of point 4.2.3 are met without further testing.

##### 7.2.2.1 **Quieter brake blocks**

A quieter brake block is a brake block belonging to one of the following categories:

- Brake block listed in Appendix G of Regulation (EU) No 321/2013;
- Brake block assessed in accordance with the procedure set out in Appendix F of this TSI.

### 7.2.2.2 Wagons operated on quieter routes

Wagons belonging to one of the categories below can be operated on the quieter routes within their area of use:

- Wagons holding an EC declaration of verification against Commission Decision 2006/66/EC concerning the technical specification for interoperability relating to the subsystem 'rolling stock — noise' of the trans-European conventional rail system;
- Wagons holding an EC declaration of verification against Commission Decision 2011/229/EU concerning the technical specifications of interoperability relating to the subsystem 'rolling stock — noise' of the trans-European conventional rail system;
- Wagons holding an EC declaration of verification against this TSI;
- Wagons fitted with quieter brake blocks as defined in point 7.2.2.1 or brake discs for the service brake function;
- Wagons fitted with composite brake blocks listed in Appendix E for the service brake function. The operation of these wagons on the quieter routes shall be limited in accordance with the conditions described in this appendix.;

(b) point 7.3.2.1 is replaced by the following:

#### 7.3.2.1. Specific cases

(a) Specific case Estonia, Finland, Latvia, Lithuania, Poland and Slovakia

(P) For units, which are in shared use with third countries, the track gauge of which is different from that of the main rail network within the Union, the application of national technical rules instead of the requirements in this TSI shall be permitted.

(b) Specific case Finland

(T) Decision 2011/229/EU may continue to apply for freight wagons to be used only on the territory of Finland and until the relevant technical solution in relation to severe winter conditions is found, but in any case not later than until 31 December 2032. This shall not prevent freight wagons from other Member States to operate on the Finnish network.'

(c) in point 7.3.2.2(a), the second subparagraph is deleted;

(d) point 7.3.2.4 is replaced by the following:

#### 7.3.2.4. Limits for pass-by noise (point 4.2.3)

(a) Specific case Channel Tunnel

(P) For the Channel Tunnel, the limits for pass-by noise shall not apply to wagons dedicated to the transport of heavy goods vehicles between Coquelles (France) and Folkestone (United Kingdom).

(b) Specific case Sweden

(T) For locomotives with total tractive power of more than 6 000 kW and a maximum axle load of more than 25 t the limit values for pass-by noise  $L_{pAeq,Tp}$  (80 km/h) in Table 4 may be raised up to 85 dB.;

(e) the following section 7.4 is added:

## 7.4 Particular implementation rules

### 7.4.1. Particular implementation rules for the application of this TSI to existing wagons (point 7.2.2)

(a) Particular implementation rules for the application of this TSI to existing wagons in the Channel Tunnel

(P) For the calculation of the annual average daily operated freight trains during night-time the freight trains composed of wagons dedicated to the transport of heavy goods vehicles confined in the Coquelles (France) - Folkestone (United Kingdom) line shall not be taken into account.

- (b) Particular implementation rules for the application of this TSI to existing wagons in Finland and Sweden

(‘T’) The concept of quieter routes shall not apply on the Finnish and Swedish networks due to uncertainties related to the operation in severe winter conditions with composite brake blocks until 31 December 2032. This shall not prevent freight wagons from other Member States to operate on the Finnish and Swedish network.

7.4.2. *Particular implementation rules for wagons operated on quieter routes (point 7.2.2.2)*

- (a) Particular implementation rules for wagons operated on quieter routes of Belgium

(‘T’) On top of the wagons listed in point 7.2.2.2, the following existing wagons can be operated on quieter routes in the territory of Belgium:

- Wagons with tyred wheels until 31 December 2026
- Wagons which require the fitting of a kink valve in order to replace the cast iron block with composite brake blocks until 31 December 2026
- Wagons fitted with cast iron blocks which require the replacement of wheels with wheels compliant with the requirements set out in EN 13979-1:2003+A2:2011 in order to be retrofitted with composite brake blocks until 31 December 2026

- (b) Particular implementation rules for wagons operated on quieter routes of Channel Tunnel

(‘P’) On top of the wagons listed in point 7.2.2.2, the following existing wagons can be operated on quieter routes in the Channel Tunnel concession:

Wagons dedicated to the transport of heavy goods vehicles between Coquelles (France) and Folkestone (United Kingdom)

- (c) Particular implementation rules for wagons operated on quieter routes of Czechia

(‘T’) On top of the wagons listed in point 7.2.2.2, the following existing wagons can be operated on quieter routes in the territory of Czechia:

- Wagons with tyred wheels, until 31 December 2026
- Wagons with 59V type bearings until 31 December 2034
- Wagons which require the fitting of a kink valve in order to replace the cast iron block with composite brake blocks, until 31 December 2034
- Wagons with 1Bg or 1Bgu brake configuration fitted with cast iron brake blocks until 31 December 2036
- Wagons fitted with cast iron blocks which require the replacement of wheels with wheels compliant with the requirements set out in EN 13979-1:2003+A2:2011 in order to be retrofitted with composite brake blocks until 31 December 2029

Furthermore, it shall not be mandatory to use composite brake blocks on quieter routes for existing wagons not covered by the five dashes above and for which there exists no one-to-one-solution for replacement of cast iron brake blocks until 31 December 2030.

- (d) Particular implementation rules for wagons operated on quieter routes of France

(‘T’) On top of the wagons listed in point 7.2.2.2, the following existing wagons can be operated on quieter routes in the territory of France:

- Wagons with 1Bg or 1Bgu brake configuration fitted with cast iron brake blocks until 31 December 2030
- Wagons fitted with small wheels (diameter under 920 mm) until 31 December 2030

(e) Particular implementation rules for wagons operated on quieter routes of Italy

(‘T’) On top of the wagons listed in point 7.2.2.2, the following existing wagons can be operated on quieter routes in the territory of Italy:

- Wagons with tyred wheels until 31 December 2026
- Wagons which require the fitting of a kink valve in order to replace the cast iron block with composite brake blocks until 31 December 2026
- Wagons fitted with cast iron blocks which require the replacement of wheels with wheels compliant with the requirements set out in EN 13979-1:2003+A2:2011 in order to be retrofitted with composite brake blocks until 31 December 2026

Furthermore, it shall not be mandatory to use composite brake blocks on quieter routes for existing wagons not covered by the three dashes above and for which there exists no one-to-one-solution for replacement of cast iron brake blocks until 31 December 2030.

(f) Particular implementation rules for wagons operated on quieter routes of Poland

(‘T’) On top of the wagons listed in point 7.2.2.2, the following existing wagons can be operated on quieter routes in the territory of Poland until 31 December 2036:

- Wagons with tyred wheels
- Wagons with 1Bg or 1Bgu brake configuration fitted with cast iron blocks
- Wagons designed for ‘S’ traffic equipped with ‘SS’ brake fitted with cast iron blocks
- Wagons fitted with cast iron blocks and designed for ‘SS’ traffic for which retrofitting with LL brake blocks would require fitting with wheels complying with EN 13979-1:2003+A2:2011 and a kink valve

(g) Particular implementation rules for wagons operated on quieter routes of Slovakia

(‘T’) On top of the wagons listed in point 7.2.2.2, the following existing wagons can be operated on quieter routes in the territory of Slovakia:

- Wagons with tyred wheels until 31 December 2026
- Wagons with bogies of type 26-2.8 fitted with cast iron blocks P10 until 31 December 2036
- Wagons, which require the fitting of a kink valve in order to replace the cast iron block with composite brake blocks until 31 December 2036.

(‘P’) Wagons with bogies 2TS intended for circulation between Slovakia and third countries by means of exchange of bogies in the border station

(h) Particular implementation rules for wagons operated on quieter routes of UK for Great Britain

(‘P’) For units intended to operate solely on the GB Network, where existing wagons are equipped with composite brake blocks published in GMGN 2688 it shall be permitted to operate on quieter routes

(‘T’) The following types of existing wagons equipped with cast iron brake blocks intended to operate on the GB Network shall be permitted to operate on quieter routes:

- Wagons equipped with a non-UIC braking system for which there are no compatible silent brake blocks available for retrofitting until 31 December 2030.
- Wagons with a designed braking distance of 810m or less from 60 mph in brake mode G (goods timing)/75 mph in brake mode P (passenger timing), where those wagons are operated in trains with other wagons which have stopping distances in accordance with the relevant UK(GB) national technical rules, until 31 December 2030
- Wagons used exclusively for the transport of nuclear products until 31 December 2050.;

8. In Appendix A ‘Open points’, the text ‘This TSI does not contain any open points’, is replaced by the following table:

‘Element of the rolling stock subsystem	Clause of this TSI	Technical aspect not covered by this TSI	Comments
Quieter brake block	7.2.2.1 and Appendix F	Assessment of the acoustic properties of the brake blocks	Alternative technical solutions available (see point 7.2.2)’

9. The following Appendices D, E and F are added:

*‘Appendix D*

### **Quieter routes**

#### **D.1 Identification of quieter routes**

In accordance with Article 5c(1) of this Regulation the Member States shall provide the European Union Agency for Railways (‘the Agency’) with a list of quieter routes in a format allowing further processing by the users with IT-tools. The list shall contain at least the following information:

- Start and end points of the quieter routes and their corresponding sections, using geographical code location as defined in the register set out in Commission Implementing Decision 2014/880/EU (\*) (RINF). If one of these points is at the border of the Member State, it shall be reflected.
- Identification of the sections making up the quieter route

The list shall be provided using the template below:

Quieter route	Sections in the route	Unique section ID	Quieter route starts/finishes at the border of the Member State
Point A — Point E	Point A — Point B	201	Yes POINT E (Country Y)
	Point B — Point C	202	
	Point C — Point D	203	
	Point D — Point E	204	
Point F — Point I	Point F — Point G	501	No
	Point G — Point H	502	
	Point H — Point I	503	

In addition, the Member States may provide maps illustrating the quieter routes on a voluntary basis. All lists and maps shall be published on the Agency website (<http://www.era.europa.eu>) no later than 9 months after 27.5.2019.

By the same date the Agency shall inform the Commission of the lists and maps of quieter routes. The Commission shall inform the Member States accordingly through the committee referred to in Article 51 of Directive (EU) 2016/797.

#### **D.2 Update of quieter routes**

The freight traffic data used for the update of quieter routes in accordance with Article 5c(2) of this Regulation shall refer to the last three years preceding the update for which the data is available. In case the freight traffic due to exceptional circumstances diverges in a given year from that average number by more than 25 %, the Member State concerned can calculate the average number on the basis of the remaining two years. Member States shall provide the Agency with the updated quieter routes.

The routes designated as quieter routes shall remain as such following the update unless during the period concerned the volume of traffic has decreased by more than 50 % and the average number of daily operated freight trains during the night-time is lower than 12.

In case of new and upgraded lines, the expected volume of traffic shall be used for the designation of those lines as quieter routes.

The Agency shall publish the updated quieter routes on its website (<http://www.era.europa.eu>) no later than 3 months after their reception and they shall apply from the next December timetable change following one year after their publication.

The Agency shall inform the Commission of any changes to the quieter routes. The Commission shall inform the Member States of these changes through the committee referred to in Article 51 of Directive (EU) 2016/797.

(\*) Commission Implementing Decision 2014/880/EU of 26 November 2014 on the common specifications of the register of railway infrastructure and repealing Implementing Decision 2011/633/EU (OJ L 356, 12.12.2014, p. 489).

#### Appendix E

### Historic composite brake blocks

#### E.1 Historic composite brake blocks for international use

Existing wagons equipped with the brake blocks listed below are allowed to be used on the quieter routes within their area of use, until the relevant date set out in Appendix N of UIC 541-4.

Manufacturer/name of product	Designation/type of block	Type of friction coefficient
Valeo/Hersot Wabco/Cobra	693 W554	K
Ferodo	I/B 436	K
Abex	229	K (Fe — sintered)
Jurid	738	K (Fe — sintered)

Wagons equipped with historic composite brake blocks not listed in the table above but already authorised for international traffic in conformity with the provisions of Decision 2004/446/EC or Decision 2006/861/EC can still be used without any deadline within the area of use covered by their authorisation.

#### E.2 Historic composite brake blocks for national use

Existing wagons equipped with the brake blocks listed below are only allowed to be used on the railway networks, including quieter routes, of the corresponding Member States within their area of use.

Manufacturer/name of the product	Designation/type of block	Member State	Remarks
Cobra/Wabco	V133	Italy	
Cofren	S153	Sweden	

Manufacturer/name of the product	Designation/type of block	Member State	Remarks
Cofren	128	Sweden	
Cofren	229	Italy	
ICER	904	Spain, Portugal	
ICER	905	Spain, Portugal	
Jurid	838	Spain, Portugal	

*Appendix F*

**Assessment of acoustic performance of a brake block**

The purpose of this procedure is to demonstrate the acoustic performance of a composite brake block at interoperability constituent level.

This procedure shall be an open point in accordance with Article 4(6) of Directive (EU) 2016/797.'

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**COMMISSION IMPLEMENTING REGULATION (EU) 2019/775**  
**of 16 May 2019**  
**amending Regulation (EU) No 454/2011 as regards Change Control Management**  
**(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 Union <sup>(1)</sup>, and in particular Article 5(11) thereof,

Whereas:

- (1) Article 19 of Regulation (EU) 2016/796 of the European Parliament and of the Council <sup>(2)</sup> requires the European Union Agency for Railways ('the Agency') to address recommendations to the Commission on the technical specifications for interoperability ('TSIs') and their revision, in accordance with Article 5 of Directive (EU) 2016/797, and to ensure that TSIs are adapted to technical progress, market trends and social requirements.
- (2) Article 14 of Commission Delegated Decision (EU) 2017/1474 <sup>(3)</sup> requires Section 7.5 of Annex I to Commission Regulation (EU) No 454/2011 <sup>(4)</sup> (TAP TSI) to be amended for specifying the modified change control procedure for the TAP TSI.
- (3) In accordance with Article 5 of Regulation (EU) 2016/796, a working party has been established for making a proposal for a recommendation as regards the changes of the Section 7.5 of the TAP TSI.
- (4) On 20 April 2018, the Agency addressed a recommendation to the Commission on the revision of Section 7.5 of Regulation (EU) No 454/2011 (TAP TSI)
- (5) Section 7.5 of Annex I to Regulation (EU) No 454/2011 related to TAP TSI should be amended accordingly.
- (6) The list of the relevant technical documents referenced in TAP TSI should be updated.
- (7) 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*

Section 7.5 of Annex I to Commission Regulation (EU) No 454/2011 (TAP TSI) is replaced by the text in Annex I to this Regulation.

<sup>(1)</sup> OJ L 138, 26.5.2016, p. 44.

<sup>(2)</sup> 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 881/2004 (OJ L 138, 26.5.2016, p. 1).

<sup>(3)</sup> 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).

<sup>(4)</sup> Commission Regulation (EU) No 454/2011 of 5 May 2011 on the technical specification for interoperability relating to the subsystem 'telematics applications for passenger services' of the trans-European rail system (OJ L 123, 12.5.2011, p. 11).

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*Article 2*

Annex III to Commission Regulation (EU) No 454/2011 is replaced by the text in Annex II to this Regulation.

*Article 3*

This Regulation shall enter into force on the twentieth 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, 16 May 2019.

*For the Commission*  
*The President*  
Jean-Claude JUNCKER

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## ANNEX I

Section 7.5 of Annex I to Commission Regulation (EU) No 454/2011 is replaced by the following:

**7.5. Change Management**

*7.5.1. Change Management Process*

Change management procedures shall be designed to ensure that the costs and benefits of change are properly analysed and that changes are implemented in a controlled way. These procedures shall be defined, put in place, supported and managed by the Agency and shall include:

- the identification of the technical constraints underpinning the change,
- a statement of who takes responsibility for the change implementation procedures,
- the procedure for validating the changes to be implemented,
- the policy for change management, release, migration and roll-out,
- the definition of the responsibilities for the management of the detailed specifications and for both its quality assurance and configuration management.

The Change Control Board (CCB) shall be composed of the Agency, rail sector representative bodies, a ticket vendor representative body, a passenger representative body and Member States. Such an affiliation of the parties shall ensure a perspective on the changes that are to be made and an overall assessment of their implications. The CCB ultimately shall be brought under the aegis of the Agency.

*7.5.2. Specific Change Management Process for documents listed in Annex III to this Regulation*

The change control management for the documents listed in Annex III to this Regulation shall be established by the Agency in accordance with the following criteria:

1. The change requests affecting the documents are submitted either via the Member States or via the representative bodies from the railway sector acting on a European level as defined in Article 38(4) of Regulation (EU) 2016/796 of the European Parliament and of the Council (\*), or the ticket vendors' representative or via the International Union of Railways (UIC) for error corrections in relation to specifications originally developed by UIC or via the TAP TSI Steering Committee.
2. The Agency shall gather and store the change requests.
3. The Agency shall present the change requests to the dedicated ERA working party, which will evaluate them and prepare a proposal accompanied by an economic evaluation, where appropriate.
4. Afterwards the Agency shall present each change request and the associated proposal to the change control board that will or will not validate or postpone the change request.
5. If the change request is not validated, the Agency shall send back to the requester either the reason for the rejection or a request for additional information about the draft change request.
6. If the change request is validated, the technical document shall be amended.
7. If no consensus about the validation of a change request can be reached, the Agency shall submit to the Commission a recommendation to update the documents listed in Annex III together with the draft new version of the document, the change requests and their economic evaluation and shall make these documents available on their web site.
8. The new version of the technical document with the validated change requests shall be made available at the site of the Agency. The Agency will keep the Member States informed via the Committee established in accordance with Article 29(1) of Directive 2008/57/EC.
9. If a change request would require a change of the legal text of the TAP TSI, the Agency shall send a request to the European commission to request a revision of the TAP TSI and/or request the technical opinion from the Agency.

Where change control management affects elements which are in common use within the TAF TSI, the changes shall be made so as to remain compliant to the implemented TAF TSI in order to achieve optimum synergies.

(\*) 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 881/2004 (OJ L 138, 26.5.2016, p. 1).

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## ANNEX II

Annex III to Regulation (EU) No 454/2011 is replaced by the following:

## ‘ANNEX III

**List of technical documents**

No	Reference	Title
1	B.1	Computer generation and exchange of tariff data meant for international or foreign sales — NRT tickets
2	B.2	Computer generation and exchange of tariff data meant for international and foreign sales — Integrated Reservation Tickets (IRT)
3	B.3	Computer generation and exchange of data meant for international or foreign sales — Special offers
4	B.4	Implementation guide for EDIFACT messages covering timetable data exchange
5	B.5	Electronic reservation of seats/berths and electronic production of travel documents — Exchange of messages
6	B.6	Electronic seat/berth reservation and electronic production of transport documents (RCT2 standards)
7	B.7	International Rail ticket for Home Printing
8	B.8	Standard numerical coding for railway undertakings, infrastructure managers and other companies involved in rail-transport chains
9	B.9	Standard numerical coding of locations
10	B.10	Electronic reservation of assistance for persons with reduced mobility — Exchange of messages
12	B.30	Schema — messages/datasets catalogue needed for the RU/IM communication of TAP TSI

**COMMISSION IMPLEMENTING REGULATION (EU) 2019/776****of 16 May 2019****amending Commission Regulations (EU) No 321/2013, (EU) No 1299/2014, (EU) No 1301/2014, (EU) No 1302/2014, (EU) No 1303/2014 and (EU) 2016/919 and Commission Implementing Decision 2011/665/EU as regards the alignment with Directive (EU) 2016/797 of the European Parliament and of the Council and the implementation of specific objectives set out in Commission Delegated Decision (EU) 2017/1474****(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 Union <sup>(1)</sup>, and in particular Articles 5(11) and 48(2) thereof,

Whereas:

- (1) In accordance with Article 19 of Regulation (EU) 2016/796 of the European Parliament and of the Council <sup>(2)</sup> the European Union Agency for Railways (the 'Agency') is required to address recommendations to the Commission on the technical specifications for interoperability (TSIs) and their revision and to ensure that TSIs are adapted to technical progress, market trends and social requirements.
- (2) TSIs should be amended in order to indicate provisions applicable to existing subsystems and vehicles, in particular in the event of their upgrading and renewal as well as to indicate the parameters of the vehicles and fixed subsystems to be checked by the railway undertaking to ensure compatibility between vehicles and the routes on which they are to be operated and the procedures to be applied to check those parameters after the vehicle authorisation for placing on the market and before the first use of the vehicle.
- (3) Commission Delegated Decision (EU) 2017/1474 <sup>(3)</sup> sets out specific objectives for the drafting, adoption and review of TSIs. On 22 September 2017, the Commission asked the Agency to prepare recommendations implementing a number of those objectives.
- (4) Under Decision (EU) 2017/1474, TSIs should be reviewed in order to take into account developments of the Union railway system relating to research and innovation activities, and update references to standards.
- (5) Furthermore TSIs should be reviewed in order to close the remaining open points. In particular, open points as regards specifications on the design of track to be compatible with the use of eddy current brake and the minimum factor for traffic codes should be closed in Commission Regulation (EU) No 1299/2014 <sup>(4)</sup>. Open points as regards specifications on aerodynamic effects, passive safety and variable gauge systems and braking systems should be closed in Commission Regulation (EU) No 1302/2014 <sup>(5)</sup>. Open points as regards specifications on test conditions for on-track tests and variable gauge systems should be closed in Commission Regulation (EU) No 321/2013 <sup>(6)</sup>.

<sup>(1)</sup> OJ L 138, 26.5.2016, p. 44.

<sup>(2)</sup> 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 881/2004 (OJ L 138, 26.5.2016, p. 1).

<sup>(3)</sup> 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).

<sup>(4)</sup> Commission Regulation (EU) No 1299/2014 of 18 November 2014 on the technical specifications for interoperability relating to the 'infrastructure' subsystem of the rail system in the European Union (OJ L 356, 12.12.2014, p. 1).

<sup>(5)</sup> Commission Regulation (EU) No 1302/2014 of 18 November 2014 concerning a technical specification for interoperability relating to the 'rolling stock — locomotives and passenger rolling stock' subsystem of the rail system in the European Union (OJ L 356, 12.12.2014, p. 228).

<sup>(6)</sup> Commission Regulation (EU) No 321/2013 of 13 March 2013 concerning the technical specification relating to the subsystem 'rolling stock — freight wagons' of the rail system in the European Union and repealing Decision 2006/861/EC (OJ L 104, 12.4.2013, p. 1).

- (6) Decision (EU) 2017/1474 also sets out specific objectives applicable to the TSI relating to the subsystem 'rolling stock — locomotives and passenger rolling stock' and the TSI relating to the subsystem 'rolling stock — freight wagons'. In particular the provisions on automatic variable gauge systems should be reviewed and access to passenger coaches, the authorisation of passenger vehicles in large areas of use and the composition of passenger trains should be facilitated.
- (7) Certain components for which a single failure has potential to lead directly to a serious accident are critical for the safety of the rail system and should be labelled as 'safety-critical' on a case-by-case basis. The manufacturer should identify safety-critical components in the vehicle maintenance file.
- (8) Trackside and on-board investments should be protected by guaranteeing compatibility and stability of the specifications of the European rail traffic management system (ERTMS), giving legal and technical certainty that a compliant Baseline 3 ERTMS on-board unit can safely run on compliant ERTMS line with an acceptable level of performance. In order to keep pace with technological progress and encourage modernisation such as ERTMS game changers, as specified in the Agency's report on *ERTMS longer-term perspective* (ERA-REP-150), their implementation should, under certain conditions, be allowed. Where the Agency issues draft released specifications of ERTMS game changers before the planned legal release in 2022, suppliers and early implementers should use the specifications in their pilot phase, provided that any Baseline 3 on-board unit can safely run on any infrastructure implementing a game changer.
- (9) On the basis of the system architecture research and innovation work of the Shift2Rail Joint Undertaking, the Agency work on the game changer related to the evolution of the radio communication system aims at proposing solutions that would allow independent life cycle management for the radio communication system and the train protection system, while facilitating the integration of the new radio communication system with the European Train Control system (ETCS) on-boards that follow the set#3 of specifications listed in Table 2.3 of Annex A to Commission Regulation (EU) 2016/919 <sup>(7)</sup>.
- (10) Even a successful certification process cannot always exclude that, when an on-board CCS subsystem interacts with a trackside CCS subsystem, one of the subsystems repeatedly fails to function or perform as intended under certain conditions. This may be due to variance in national control-command and signalling equipment (e.g. interlockings), engineering and operational rules, deficiencies in the specifications, different interpretations, design errors or equipment being installed incorrectly. Therefore, checks might need to be carried out to demonstrate the technical compatibility of the control-command and signalling subsystems in the area of use for a vehicle. The necessity of these checks should be considered as a temporary measure to increase the confidence on the technical compatibility between the subsystems. In addition, Regulation (EU) 2016/919 should specify the procedure for those checks. In particular, the principles applicable to those checks should be transparent and prepare the ground for further harmonisation. The possibility of executing those checks in a laboratory representing the trackside configuration to be made available by the Infrastructure Manager should be prioritised.
- (11) To limit to a minimum the checks each Member State should promote harmonisation within its infrastructure. Following this principle, only one single set of compatibility checks for radio (one for voice transmission and another one for data transmission), if at all needed, should be requested per Member State.
- (12) Consideration should be given on the necessary steps in the shortest possible time to increase the confidence on the technical compatibility and to reduce and eliminate the tests or checks to prove technical compatibility of on-board units with different European rail traffic management system trackside implementations. Therefore, the Agency should assess the underlying technical divergences and define the necessary steps to eliminate the tests or checks to prove technical compatibility of on-board units with different trackside implementations.
- (13) Certain TSIs may provide transitional measures in order to keep the railway sector competitive and to prevent undue costs triggered by too frequent changes in the legal framework. Such transitional measures apply to contracts in course of performance and to projects at an advanced stage of development on the date of application of the relevant TSI. As long as these transitional measures apply, requests for application of Article 7(1) of Directive 2016/797/EC should not be needed. Once these transitional measures expire, applicants requesting non-application of TSIs or part of them should do so pursuant to Article 7(1) of Directive (EU) 2016/797. Such requests should however only in duly justified cases be based on Article 7(1)(a) of Directive 2016/797/EC.

<sup>(7)</sup> 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).

- (14) Directive (EU) 2016/797 and Commission Implementing Regulation (EU) 2018/545 <sup>(8)</sup> set out the Agency's role as authorising entity. In addition, Implementing Regulation (EU) 2018/545 sets out the procedure applicable in the event of a change to existing vehicle types, in particular for the creation of versions of a vehicle type and versions of a vehicle type variant. The Agency's role in registering data in the European register of authorised types of railway vehicles (ERATV) and the tasks of authorising entities as regards versions of a vehicle type and versions of a vehicle type variant should be adapted accordingly.
- (15) Regulations (EU) No 321/2013, (EU) No 1302/2014, and (EU) 2016/919 should take into account changes in the procedure for placing mobile subsystems on the market, as provided for in Articles 20 to 26 of Directive (EU) 2016/797. Those TSIs should therefore list the basic design characteristics used to identify the vehicle type and set out requirements regarding changes that impact them. The list of ERATV parameters should be amended accordingly.
- (16) Under Decision (EU) 2017/1474, TSIs should indicate whether it is necessary to re-notify the conformity assessment bodies that were notified on the basis of a previous version of the TSI and whether a simplified notification process should be applied. This Regulation brings about limited changes and it should not be necessary to re-notify bodies notified on the basis of a previous version of the TSIs.
- (17) This Regulation amends TSIs so as to further achieve interoperability within the Union rail system, improve and develop international rail transport, contribute to the progressive creation of the internal market and complement TSIs in view of covering essential requirements. It enables to achieve the objectives and to meet the essential requirements of Directive 2008/57/EC of the European Parliament and of the Council <sup>(9)</sup> and Directive (EU) 2016/797. Therefore this Regulation should be directly applicable in all Member States including Member States which have notified the Agency and the Commission under Article 57(2) of Directive (EU) 2016/797 that they have extended the transposition period and thus continue to apply Directive 2008/57/EC until 15 June 2020 at the latest. Notified Bodies exercising under Directive 2008/57/EC in the Member States that have extended the transposition period should be able to issue 'EC' certificate in accordance with this Regulation as long as Directive 2008/57/EC applies in the Member State where they are established.
- (18) On 17 December 2015, 6 January 2016 and 14 November 2017, the Agency issued three recommendations to amend Regulation (EU) No 1302/2014 covering the conditions for having an authorisation for placing on the market not limited to particular national networks, the closing of open-points, requirements regarding safety critical components and the revision of provisions on automatic variable gauge systems.
- (19) On 11 April 2016, the Agency issued a recommendation on the amendment to Regulation (EU) No 321/2013 covering the closing of open-points.
- (20) On 4 October 2017, the Agency issued a recommendation on the amendment to Regulation (EU) No 1299/2014 covering the closing of open-points.
- (21) On 19 July 2018, the Agency issued a recommendation on the amendment to Regulations (EU) No 321/2013 and (EU) No 1302/2014 and Commission Implementing Decision 2011/665/EU <sup>(10)</sup> covering the changes in the procedure for placing mobile subsystems on the market, including the checking of vehicle-route compatibility after the vehicle authorisation and before the first use of authorised vehicles and provisions applicable to existing subsystems and vehicles, in particular in the event of their upgrading and renewal.
- (22) On 19 October 2018, the Agency issued a recommendation on the amendment to Regulation (EU) 2016/919 covering the changes in the procedure for placing mobile subsystems on the market, including the checking of vehicle-route compatibility before the first use of authorised vehicles and provisions applicable to existing subsystems and vehicles, in particular in the event of their upgrading and renewal.
- (23) On 15 November 2018, the Agency issued a recommendation on the amendment to Regulation (EU) No 1303/2014 covering the changes to align that Regulation with Directive (EU) 2016/797.

<sup>(8)</sup> Commission Implementing Regulation (EU) 2018/545 of 4 April 2018 establishing practical arrangements for the railway vehicle authorisation and railway vehicle type authorisation process pursuant to Directive (EU) 2016/797 of the European Parliament and of the Council (OJ L 90, 6.4.2018, p. 66).

<sup>(9)</sup> Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community (OJ L 191, 18.7.2008, p. 1).

<sup>(10)</sup> Commission Implementing Decision 2011/665/EU of 4 October 2011 on the European register of authorised types of railway vehicles (OJ L 264, 8.10.2011, p. 32).



- (24) On 29 November 2018, the Agency issued a recommendation on the amendment to Regulations (EU) No 1299/2014 and (EU) No 1301/2014 covering the changes to align those Regulations with Directive (EU) 2016/797.
- (25) Regulation (EU) No 321/2013, Regulation (EU) No 1299/2014, Regulation (EU) No 1301/2014, Regulation (EU) No 1302/2014, Regulation (EU) No 1303/2014, Regulation (EU) 2016/919 and Implementing Decision 2011/665/EU should therefore be amended accordingly.
- (26) 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

Regulation (EU) No 321/2013 is amended as follows:

- (1) in Article 2(1), the reference to ‘point 2.7 of Annex II to Directive 2008/57/EC’ is replaced by a reference to ‘point 2.7 of Annex II to Directive (EU) 2016/797 of the European Parliament and of the Council (\*)’

(\*) 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 Union (OJ L 138, 26.5.2016, p. 44).’;

- (2) in Article 3, the second subparagraph is amended as follows:

- (a) point (a) is replaced by the following:

‘(a) when it is renewed and upgraded in accordance with section 7.2.2 of the Annex to this Regulation’;

- (b) point (c) is replaced by the following:

‘(c) with regards to the marking “GE” as depicted in point 5 of Appendix C of the Annex, wagons of the existing fleet which have been authorised in accordance with Commission Decision 2006/861/EC as amended by Decision 2009/107/EC or with Decision 2006/861/EC as amended by Decisions 2009/107/EC and 2012/464/EU and meeting the conditions set out in point 7.6.4 of Decision 2009/107/EC may receive this marking “GE” without any additional third party assessment or new authorisation for placing on the market. The use of this marking in wagons in operation remains under the responsibility of the railway undertakings.’;

- (3) Article 4 is amended as follows:

- (a) paragraph 1 is replaced by the following:

‘1. With regard to “open points” set out in Appendix A, the conditions to be complied with for the verification of the essential requirements of Directive (EU) 2016/797 shall be those laid down by national rules in force in the Member State which is part of the area of use of the vehicles covered by this Regulation’;

- (b) point (c) of paragraph 2 is replaced as follows:

‘(c) the bodies designated to carry out the conformity assessment and verification procedures with respect to the open points’;

- (4) Article 5 is amended as follows:

- (a) paragraph 1 is replaced by the following:

‘1. With regard to specific cases set out in Section 7.3 of the Annex, the conditions to be met for the verification of the essential requirements of Directive (EU) 2016/797 shall be those laid down in Section 7.3 of the Annex or by national rules in force in the Member State which is part of the area of use of the vehicles covered by this Regulation’;

- (b) point (c) of paragraph 2 is replaced as follows:

‘(c) the bodies designated to carry out the conformity assessment and verification procedures for the national rules relating to the specific cases set out in point 7.3 of the Annex’;

(5) Article 8 is amended as follows:

(a) paragraph 1 is replaced by the following:

‘1. An EC certificate of verification for a subsystem that contains interoperability constituents which do not have an EC declaration of conformity or suitability for use may be issued during a transition period ending on 1 January 2024, provided the provisions set out in Section 6.3 of the Annex are met.’;

(b) paragraph 2 is replaced by the following:

‘2. The production or upgrade/renewal of the subsystem using non-certified interoperability constituents shall be completed within the transition period set out in paragraph 1, including placing on the market.’;

(c) in point (b) of paragraph 3, the reference to ‘Article 18 of Directive 2004/49/EC’ is replaced by a reference to ‘Article 19 of Directive (EU) 2016/798 of the European Parliament and of the Council (\*)’

(\*) Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety (OJ L 138, 26.5.2016, p. 102).’;

(d) paragraph 4 is replaced by the following:

‘4. After a transition period ending on 1 January 2015, newly produced interoperability constituents of “rear-end signals”, shall be covered by the required EC declaration of conformity.’;

(6) Article 8a is amended as follows:

(a) paragraph 1 is replaced by the following:

‘1. Notwithstanding the provisions in Section 6.3 of the Annex, an EC certificate of verification may be issued for a subsystem containing components corresponding to the “friction element for wheel tread brakes” interoperability constituent that does not have an EC declaration of conformity during a transition period ending on 1 January 2024, if the following conditions are met:

(a) the component was manufactured before the date of application of this Regulation; and

(b) the interoperability constituent has been used in a subsystem that had been approved and placed on the market in at least one Member State before the date of application of this Regulation.’;

(b) paragraph 2 is replaced by the following:

‘2. The production, upgrade or renewal of any subsystem using non-certified interoperability constituents shall be completed, including granting authorisation for placing on the market, before the transition period set out in paragraph 1 expires.’;

(c) in point (b) of paragraph 3, the reference to ‘Article 18 of Directive 2004/49/EC’ is replaced by a reference to ‘Article 19 of Directive (EU) 2016/798’;

(7) Article 8 c is amended as follows:

(a) point (b) of paragraph 1 is replaced by the following:

‘(b) the interoperability constituent has been used in a subsystem that had been approved and placed on the market in at least one Member State before the expiry of its approval period.’;

(b) paragraph 2 is replaced by the following:

‘2. The production, upgrade or renewal of any subsystem using non-certified interoperability constituents shall be completed, including granting authorisation for placing on the market, before the transition period set out in paragraph 1 expires.’;

(c) in point (b) of paragraph 3, the reference to ‘Article 18 of Directive 2004/49/EC’ is replaced by a reference to ‘Article 19 of Directive (EU) 2016/798’;

(8) Article 9 is amended as follows:

‘The declaration of verification and/or conformity to type of a new vehicle established in accordance with Decision 2006/861/EC shall be considered valid until the end of a transition period ending on 1 January 2017.’;

(9) Article 10a is amended as follows:

- (a) in paragraph 4, the reference to 'Article 6 of Directive 2008/57/EC' is replaced by a reference to 'Article 5 of Directive (EU) 2016/797';
- (b) in paragraph 5, the reference to 'Directive 2008/57/EC' is replaced by a reference to 'Directive (EU) 2016/797';

(10) the Annex is amended in accordance with Annex I to this Regulation.

## Article 2

Regulation (EU) No 1299/2014 is amended as follows:

(1) Article 2 is amended as follows:

- (a) in paragraph 1, the reference to 'point 2.1 of Annex I to Directive 2008/57/EC' is replaced by a reference to 'point 2.1 of Annex II to Directive (EU) 2016/797 of the European Parliament and of the Council (\*)'

(\*) 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 Union (OJ L 138, 26.5.2016, p. 44).';

- (b) in paragraph 3, the reference to 'Article 20 of Directive 2008/57/EC' is replaced by a reference to 'Article 18 of Directive (EU) 2016/797';

(c) paragraph 4 is replaced as follows:

'4. The TSI shall apply to the network of the Union rail system as described in Annex I of Directive (EU) 2016/797 with the exclusion of cases referred to in Article 1(3) and (4) of Directive (EU) 2016/797';

(2) Article 3 is amended as follows:

(a) paragraph 1 is replaced by the following:

'1. With regard to the aspects listed as "open points" in Appendix R to the Annex to this Regulation, the conditions to be complied with for verifying the essential requirements set out in Annex III to Directive (EU) 2016/797 shall be those laid down by national rules in force in the Member State which authorises the placing in service of the subsystem covered by this Regulation.';

(b) point (c) of paragraph 2 is replaced as follows:

'(c) the bodies designated to carry out the conformity assessment and verification procedures with respect to the open points';

(3) in Article 4, paragraph 1 is replaced by the following:

'1. With regard to specific cases listed in Section 7.7 of the Annex, 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 Section 7.7 of the Annex or by national rules in force in the Member State which authorises the placing in service of the subsystem covered by this Regulation';

(4) point (c) of paragraph 2 of Article 4 is replaced by the following:

'(c) the bodies designated to carry out the conformity assessment and verification procedures for the national rules relating to the specific cases set out in point 7.7 of the Annex';

(5) Article 7(3) is amended as follows;

- (a) in point (a), the reference to 'Article 18 of Directive 2008/57/EC' is replaced by a reference to 'Article 15 of Directive (EU) 2016/797';

- (b) in point (b), the references to 'Article 16(2)(c) of Directive 2004/49/EC' and 'Article 18 of Directive 2004/49/EC' are replaced by references to 'Article 16(2)(d) of Directive (EU) 2016/798 of the European Parliament and of the Council (\*)'

(\*) Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety (OJ L 138, 26.5.2016, p. 102).'

and 'Article 19 of Directive (EU) 2016/798' respectively;

- (6) in Article 9, paragraph 2 is deleted;
- (7) Article 10 is amended as follows:
  - (a) in paragraph 4, the reference to 'Article 6 of Directive 2008/57/EC' is replaced by a reference to 'Article 5 of Directive (EU) 2016/797';
  - (b) in paragraph 5, the reference to 'Directive 2008/57/EC' is replaced by a reference to 'Directive (EU) 2016/797';
- (8) the Annex is amended in accordance with Annex II to this Regulation.

### Article 3

Regulation (EU) No 1301/2014 is amended as follows:

- (1) Article 2 is amended as follows:
  - (a) in paragraph 1, the reference to 'point 2.2 of Annex II to Directive 2008/57/EC' is replaced by a reference to 'point 2.2 of Annex II to Directive (EU) 2016/797 of the European Parliament and of the Council (\*)'
    - (\*) 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 Union (OJ L 138, 26.5.2016, p. 44).';
  - (b) in paragraph 3, the reference to 'Article 20 of Directive 2008/57/EC' is replaced by a reference to 'Article 18 of Directive (EU) 2016/797';
  - (c) paragraph 4 is replaced as follows:

'4. The TSI shall apply to the network of the Union rail system as described in Annex I of Directive (EU) 2016/797 with the exclusion of cases referred to in Article 1(3) and (4) of Directive (EU) 2016/797';
- (2) Article 4 is amended as follows:
  - (a) paragraph 1 is replaced by the following:

'1. With regard to specific cases listed in Section 7.4.2 of the Annex, the conditions to be met for the verification of compliance with the essential requirements set out in Annex III to Directive (EU) 2016/797 shall be those laid down in Section 7.4.2 of the Annex or by national rules in force in the Member State which authorises the placing in service of the subsystem covered by this Regulation.';
  - (b) point (c) of paragraph 2 is replaced by the following:

'(c) the bodies designated to carry out the conformity assessment and verification procedures for the national rules relating to the specific cases set out in point 7.4.2 of the Annex';
- (3) Article 7(3) is amended as follows:
  - (a) in point (a), the reference to 'Article 18 of Directive 2008/57/EC' is replaced by a reference to 'Article 15 of Directive (EU) 2016/797';
  - (b) in point (b), the references to 'Article 16(2)(c) of Directive 2004/49/EC' and 'Article 18 of Directive 2004/49/EC' are replaced by references to 'Article 16(2)(d) of Directive (EU) 2016/798 of the European Parliament and of the Council (\*)'
    - (\*) Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety (OJ L 138, 26.5.2016, p. 102).'and 'Article 19 of Directive (EU) 2016/798' respectively;
- (4) in Article 9, paragraph 2 is deleted;
- (5) Article 10 is amended as follows:
  - (a) in paragraph 4, the reference to 'Article 6 of Directive 2008/57/EC' is replaced by a reference to 'Article 5 of Directive (EU) 2016/797';
  - (b) in paragraph 5, the reference to 'Directive 2008/57/EC' is replaced by a reference to 'Directive (EU) 2016/797';
- (6) the Annex is amended in accordance with Annex III to this Regulation.

## Article 4

Regulation (EU) No 1302/2014 is amended as follows:

- (1) in Article 2(1), the reference to ‘point 2.7 of Annex II to Directive 2008/57/EC’ is replaced by a reference to ‘point 2.7 of Annex II to Directive (EU) 2016/797 of the European Parliament and of the Council (\*)’

(\*) 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 Union (OJ L 138, 26.5.2016, p. 44).’;

- (2) in Article 3, paragraph 2 is replaced by the following:

‘2. The TSI shall not apply to existing rolling stock of the rail system in the Union which is already placed in service on all or part of the network of any Member State on 1 January 2015, except when it is subject to renewal or upgrading in accordance with Section 7.1.2 of the Annex.’;

- (3) Article 4 is amended as follows:

- (a) paragraph 1 is replaced by the following:

‘1. With regard to the aspects listed as “open points” in Appendix I of the Annex, the conditions to be complied with for verifying the essential requirements set out in Annex III to Directive (EU) 2016/797 shall be those laid down by national rules in force in the Member States which are part of the area of use of the vehicles covered by this Regulation.’;

- (b) point (c) of paragraph 2 is replaced as follows:

‘(c) the bodies designated to carry out the conformity assessment and verification procedures with respect to the open points’;

- (4) in Article 5, paragraph 1 is replaced by the following:

‘1. With regard to specific cases listed in Section 7.3 of the Annex, 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 Section 7.3 of the Annex or by national rules in force in the Member States which are part of the area of use of the vehicles covered by this Regulation’;

- (5) point (c) of paragraph 2 of Article 5 is replaced by the following:

‘(c) the bodies designated to carry out the conformity assessment and verification procedures for the national rules relating to the specific cases set out in point 7.3 of the Annex’;

- (6) Article 8(3) is amended as follows:

- (a) in point (a), the references to ‘Article 18 of Directive 2008/57/EC’ and ‘Article 16(2)(c) of Directive 2004/49/EC’ are replaced by a reference to ‘Article 15 of Directive (EU) 2016/797’;

- (b) in point (b) the references to ‘Article 16(2)(c) of Directive 2004/49/EC’ and ‘Article 18 of Directive 2004/49/EC’ are replaced by references to ‘Article 16(2)(d) of Directive (EU) 2016/798 of the European Parliament and of the Council (\*)’

(\*) Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety (OJ L 138, 26.5.2016, p. 102).’

and ‘Article 19 of Directive (EU) 2016/798’ respectively;

- (7) in Article 9, the references to ‘Articles 16 to 18 of Directive 2008/57/EC’ and ‘Article 26 of Directive 2008/57/EC’ are replaced by references to ‘Articles 13 to 15 of Directive (EU) 2016/797’ and ‘Article 24 of Directive (EU) 2016/797’ respectively;

- (8) Article 10 is amended as follows:

- (a) in paragraph 4, the reference to ‘Article 6 of Directive 2008/57/EC’ is replaced by a reference to ‘Article 5 of Directive (EU) 2016/797’;

- (b) in paragraph 5, the reference to ‘Directive 2008/57/EC’ is replaced by a reference to ‘Directive (EU) 2016/797’;

(9) the following paragraph 3 is added in Article 11:

‘3. Section 7.1.3.1 of the Annex to this Regulation shall not apply for vehicles placed on the market after 31 December 2028. Vehicles placed on the market after that date shall be conform to chapters 4, 5 and 6 of the Annex to the present Regulation.’;

(10) the following paragraph 4 is added in Article 11:

‘4. Member States may only in duly justified cases permit applicants not to apply this Regulation or parts of it pursuant to Article 7(1)(a) of Directive 2016/797/EC for projects for which the possibility to apply sections 7.1.1.2 or 7.1.3.1 of the Annex exists or has expired. The application of sections 7.1.1.2 or 7.1.3.1 of the Annex does not require the application of Article 7(1)(a) of Directive 2016/797/EC.’;

(11) the Annex is amended in accordance with Annex IV to this Regulation.

#### Article 5

Regulation (EU) No 1303/2014 is amended as follows:

(1) in Article 2, the reference to ‘Annex II to Directive 2008/57/EC’ is replaced by a reference to ‘Annex II to Directive (EU) 2016/797 (\*)’

(\*) 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 Union (OJ L 138, 26.5.2016, p. 44).’;

(2) Article 4 is amended as follows:

(a) paragraph 1 is replaced by the following:

‘1. With regard to specific cases listed in Section 7.3 of the Annex, 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 Section 7.3 of the Annex or by national rules in force in the Member State which authorises the placing in service of the fixed subsystems or which is part of the area of use of the vehicles covered by this Regulation.’;

(b) point (c) of paragraph 2 is replaced by the following:

‘(c) the bodies designated to carry out the conformity assessment and verification procedures for the national rules relating to the specific cases set out in point 7.3 of the Annex’;

(3) Article 8 is amended as follows:

(a) in paragraph 4, the reference to ‘Article 6 of Directive 2008/57/EC’ is replaced by a reference to ‘Article 5 of Directive (EU) 2016/797’;

(b) in paragraph 5, the reference to ‘Directive 2008/57/EC’ is replaced by a reference to ‘Directive (EU) 2016/797’;

(4) the Annex is amended in accordance with Annex V to this Regulation.

#### Article 6

Regulation (EU) 2016/919 is amended as follows:

(1) Article 2 is amended as follows:

(a) paragraph 1 is replaced by:

‘1. The TSI shall apply to all new, upgraded or renewed “trackside control-command and signalling” and “on-board control-command and signalling subsystems of the rail system as defined in points 2.3 and 2.4 of Annex II to Directive (EU) 2016/797 of the European Parliament and of the Council (\*). Section 7.2.1a of the Annex shall apply to all changes to an existing On-Board subsystem.

(\*) 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 Union (OJ L 138, 26.5.2016, p. 44).’;

- (b) in paragraph 2, the words ‘Article 20 of Directive 2008/57/EC and’ are deleted;
- (c) paragraph 3 is deleted;
- (2) in Article 3(1), the reference to ‘Article 17(3) of Directive 2008/57/EC’ is replaced by a reference to ‘Article 14 of Directive (EU) 2016/797’;
- (3) Article 5 is deleted;
- (4) Article 6 is amended as follows:
- (a) in paragraph 2, the reference to ‘Articles 13 and 18 of Directive 2008/57/EC’ is replaced by the reference to ‘Articles 10 and 15 of Directive (EU) 2016/797’;
- (b) in paragraph 3, the reference to ‘Article 16 of Directive 2004/49/EC’ is replaced by a reference to ‘Article 16 of Directive (EU) 2016/798 of the European Parliament and of the Council (\*)’.
- (\*) Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety (OJ L 138, 26.5.2016, p. 102).;
- (5) Article 9 is amended as follows:
- (a) in paragraph 4, the reference to ‘Article 29(1) of Directive 2008/57/EC’ is replaced by a reference to ‘Article 51(1) of Directive (EU) 2016/797’;
- (b) in paragraph 5, the reference to ‘points 7.3.2.1, 7.3.2.2 and 7.3.2.3 of Decision 2012/88/EU’ is replaced by a reference to ‘Article 2(1) of Commission Implementing Regulation (EU) 2017/6 (\*) and point 7.4.1.1 of the Annex to this Regulation.’
- (\*) Commission Implementing Regulation (EU) 2017/6 of 5 January 2017 on the European Rail Traffic Management System European deployment plan (OJ L 3, 6.1.2017, p. 6);
- (6) Articles 10 and 11 are replaced by the following:

*‘Article 10*

#### **Error corrections**

If errors that do not allow the system to provide a normal service are detected, the Agency shall of its own motion or at the request of the Commission identify as soon as possible solutions to correct them and an evaluation of their impact on the compatibility and stability of the existing ERTMS deployment. In such cases, the Agency shall send to the Commission an opinion on such solutions and the evaluation. The Commission shall analyse the Agency’s opinion, assisted by the committee referred to in Article 51(1) of Directive (EU) 2016/797, and may recommend that the solutions specified in the Agency’s opinion apply until the next revision of the TSI.

*Article 11*

#### **ERTMS game changers**

1. By June 2021, taking into consideration the input from Shift2Rail and the Agency, the Commission shall issue a report on the definition of the next generation communication system. The report shall include the conditions and possible strategies for the migration to that system with due considerations for the coexistence of the system and spectrum requirements.

2. Where the Agency has issued an opinion with the draft release specifications relating to an ERTMS game changer as identified within ERA-REP-150, suppliers and early implementers shall use those specifications in their pilots and shall inform the Agency.’;

- (7) the following Article 11a is inserted:

*‘Article 11a*

#### **ERTMS compatibility and future revision**

1. By 1 June 2020, the Agency shall send a report to the Commission on the implementation of ETCS system compatibility (ESC) and radio system compatibility (RSC). The report shall include an assessment of the differing types of ESC and RSC, and the potential for reducing the underlying technical divergences of ESC and RSC types. Member States shall provide the Agency with the necessary information to complete the analysis.

2. By 1 December 2021, the Commission shall, based on input from the Agency, define the necessary steps to eliminate the tests or checks to prove technical compatibility of on-board units with different ERTMS trackside implementations, in particular to achieve harmonisation of engineering and operational rules at Member State level and between Member States. Member States shall provide the Commission and the Agency with the necessary information to complete the analysis.

3. By 1 December 2020, the Agency shall send a report to the Commission on the potential for including further elements of trackside and vehicle control-command and signalling system architecture, in particular to achieve a future proof design, facilitating the use of state of the art technology and ensuring backward compatibility.;

(8) the following paragraphs 2 and 3 are added in Article 13:

‘2. Member States may only in duly justified cases permit applicants not to apply Section 7.4.2.1 of the Annex pursuant to Article 7(1)(a) of Directive 2016/797/EC for projects for which the possibility to apply section 7.4.2.3 of the Annex exists or has expired. The application of section 7.4.2.3 of the Annex does not require the application of Article 7(1)(a) of Directive 2016/797/EC.

3. Without prejudice to sections 6.1.2.4 and 6.1.2.5 of the Annex, applicants may continue to apply the provisions of the original version of Regulation (EU) 2016/919 (and relevant Agency opinions) when applying for authorisation of:

(a) trackside projects which are at an advanced stage of development at the date of entry into force of this Regulation; and

(b) on-board projects developed in accordance with ERTMS specifications #2 or #3 listed in Table A.2 of Annex A which are at an advanced stage of development at the date of entry into force of this Regulation.;

(9) the Annex is amended in accordance with Annex VII to this Regulation.’.

#### Article 7

Implementing Decision 2011/665/EU is amended as follows:

(1) the following Article 2a is inserted:

‘Article 2a

#### **Information to be inserted by the Agency**

The Agency shall insert in the European register of authorised types of vehicles information on the vehicle type authorisations or vehicle type variants it has granted and on new versions of a vehicle type or of a vehicle type variant in accordance with Article 50 of Commission Implementing Regulation (EU) 2018/545 (\*), as set out in Annex II to this Decision.

(\*) Commission Implementing Regulation (EU) 2018/545 of 4 April 2018 establishing practical arrangements for the railway vehicle authorisation and railway vehicle type authorisation process pursuant to Directive (EU) 2016/797 of the European Parliament and of the Council (OJ L 90, 6.4.2018, p. 66).;

(2) in Article 3, paragraph 1 is replaced by the following:

‘1. Member States shall ensure that the national safety authorities provide the information on the vehicle type authorisations or vehicle type variants they have granted and on the new version of a vehicle type or of a vehicle type variant in accordance with Article 50 of Regulation (EU) 2018/545, as set out in Annex II to this Decision.’;

(3) Article 4 is replaced by the following:

‘Article 4

#### **Restriction codes**

Harmonised restriction codes shall be applicable in all Member States.

The list of harmonised restriction codes shall be the list referred to in Commission Implementing Decision (EU) 2018/1614 (\*).

(\*) Commission Implementing Decision (EU) 2018/1614 of 25 October 2018 laying down specifications for the vehicle registers referred to in Article 47 of Directive (EU) 2016/797 of the European Parliament and of the Council and amending and repealing Commission Decision 2007/756/EC (OJ L 268, 26.10.2018, p. 53).;



- (4) Annex I is amended in accordance with Annex VIII to this Regulation;
- (5) Annex II is replaced by Annex IX to this Regulation.

*Article 8*

In accordance with Regulations (EU) No 1299/2014 and (EU) No 1303/2014, each Member State shall update its national implementation plan for the INF TSI and SRT TSI. Each Member State shall forward its updated implementation plan to the other Member States and the Commission by 1 January 2020.

*Article 9*

1. Notifications of conformity assessment bodies for the purposes of Regulations (EU) No 321/2013, (EU) No 1299/2014, (EU) No 1301/2014, (EU) No 1302/2014, (EU) No 1303/2014 and (EU) 2016/919 shall remain valid on the basis of those Regulations, as amended by the present Regulation.
2. Conformity assessment bodies notified in accordance with Directive 2008/57/EC may issue 'EC' certificate of verification and 'EC' certificate of conformity or suitability for use of interoperability constituents in accordance with this Regulation as long as Directive 2008/57/EC applies in the Member State where they are established in accordance with Article 57(2) of Directive (EU) 2016/797 and until 15 June 2020 at the latest.

*Article 10*

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

It shall apply from 16 June 2019.

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

Done at Brussels, 16 May 2019.

*For the Commission*  
*The President*  
Jean-Claude JUNCKER

## ANNEX I

The Annex to Regulation (EU) No 321/2013 is amended as follows:

- (1) in sections 1, 1.3, 3, 4.1, 4.2.1, 4.7, 5.1, 6.1.2.3, the references to 'Directive 2008/57/EC' are replaced by references to 'Directive (EU) 2016/797';
- (2) section 1.2 is replaced by the following:

**1.2. Geographical scope**

The geographical scope of this TSI is the entire European Union's rail system as set out in the section 1 of Annex I to Directive (EU) 2016/797, taking into account the limitations concerning the track gauge set out in Article 2.;

- (3) Section 2 is replaced as follows:

**2. SCOPE AND DEFINITION OF SUBSYSTEM**

**2.1. Scope**

This TSI is applicable to "freight wagons including vehicles designed to carry lorries" as referred to in Annex I Section 2 to Directive (EU) 2016/797 taking into account the limitations as set out in Article 2. In the following this part of the subsystem rolling stock is called "freight wagon" and belongs to the subsystem "rolling stock" as set out in Annex II to Directive 2016/797/EC.

The other vehicles listed in Section 2 of Annex I to Directive (EU) 2016/797 are excluded from the scope of this TSI; this is especially the case for:

- (a) mobile railway infrastructure construction and maintenance equipment;
- (b) vehicles designed to carry:
  - motor vehicles with their passengers on board, or
  - motor vehicles without passengers on board but intended to be integrated in passenger trains (car carriers);
- (c) vehicles which
  - increase their length in loaded configuration, and
  - their payload itself is part of the vehicle structure.

*Note:* See also section 7.1 for particular cases.

**2.2. Definitions**

In the present TSI the following definitions are used:

- (a) A "unit" is the generic term used to name the rolling stock. It is subject to the application of this TSI, and therefore subject to the EC verification procedure.

A unit can consist of:

- a "wagon" that can be operated separately, featuring an individual frame mounted on its own set of wheels, or
  - a rake of permanently connected "elements", those elements cannot be operated separately, or
  - "separate rail bogies connected to compatible road vehicle(s)" the combination of which forms a rake of a rail compatible system.
- (b) A "train" is an operational formation consisting of several units.

- (c) The “design operating state” covers all conditions under which the unit is intended to operate and its technical boundaries. This design operating state may go beyond the specifications of this TSI in order that units may be used together in a train on the network under the safety management system of a railway undertaking.;

- (4) Section 3, row 4.2.3.6.6 of Table 1 is replaced as follows:

'4.2.3.6.6	Automatic variable gauge systems	1.1.1, 1.1.2, 1.1.3	1.2			1.5'
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- (5) Section 4.2.2.2 is replaced as follows:

'4.2.2.2 The structure of a unit body, any equipment attachments and lifting and jacking points shall be designed such that no cracks, no significant permanent deformation or ruptures occur under the load cases defined in Chapter 5 of EN 12663-2:2010.

In case of a rake of a rail compatible system composed of separate rail bogies connected to compatible road vehicles, the load cases may differ from those mentioned above, due to their bi-modal specification; in such a case, the load cases considered shall be described by the applicant based on a consistent set of specifications with consideration of the specific conditions of use related to train composition, shunting and operation.

The demonstration of conformity is described in point 6.2.2.1.

The lifting and jacking positions shall be marked on the unit. The marking shall comply with point 4.5.14 of EN 15877-1:2012.

*Note:* Joining techniques are deemed to be covered as well by the demonstration of conformity in accordance to point 6.2.2.1.;

- (6) in the second and third paragraph of section 4.2.3.1, the text 'EN 15273-2:2009' is replaced by 'EN 15273-2:2013 +A1:2016';
- (7) in section 4.2.3.1, the text 'GIC1 and GIC2' is replaced by 'GI1 and GI2';
- (8) in section 4.2.3.2, the text 'EN 15528:2008' is replaced by 'EN 15528:2015';
- (9) in section 4.2.3.3, the text 'Commission Decision 2012/88/EU (1)' is replaced by 'ERA/ERTMS/033281 rev. 4.0';
- (10) in point 4.2.3.3 the footnote '(1) OJ L 51, 23.2.2012, p. 1.' is deleted;
- (11) in section 4.2.3.4, the text 'The specifications of the design and the conformity assessment of on-board equipment is an open point in this TSI.' is replaced as follows:

If the unit is intended to be capable of being monitored by on-board equipment, the following requirements shall apply:

- This equipment shall be able to detect a deterioration of any of the axle box bearings of the unit.
- The bearing condition shall be evaluated either by monitoring its temperature, or its dynamic frequencies or some other suitable bearing condition characteristic.
- The detection system shall be located entirely on board the unit, and diagnosis messages shall be available on board the unit.
- The diagnosis messages delivered and how they are made available shall be described in the operating documentation set out in section 4.4 of this TSI, and in the maintenance rules described in section 4.5 of this TSI.;

- (12) in section 4.2.3.5.2 the text 'Chapter 5 of EN 14363:2005' is replaced by 'chapters 4, 5 and 7 of EN 14363:2016';

(13) section 4.2.3.6.6 is replaced as follows:

*4.2.3.6.6. Automatic variable gauge systems*

This requirement is applicable to units equipped with an automatic variable gauge system with changeover mechanism of the axial position of the wheels allowing the unit to be compatible with 1 435 mm track gauge and other track gauge(s) within the scope of this TSI by means of passage through a track gauge changeover facility.

The changeover mechanism shall ensure the locking in the correct intended axial position of the wheel.

After passage through the track gauge changeover facility, the verification of the state of the locking system (locked or unlocked) and of the position of the wheels shall be performed by one or more of the following means: visual control, on-board control system or infrastructure/facility control system. In case of on-board control system, a continuous monitoring shall be possible.

If a running gear is equipped with brake equipment subject to a change in position during the gauge change operation, the automatic variable gauge system shall ensure the position and safe locking in the correct position of this equipment simultaneously to those of the wheels.

The failure of the locking of the position of the wheels and braking equipment (if relevant) during operation has typical credible potential to lead directly to a catastrophic accident (resulting in multiple fatalities); considering this severity of the failure consequence, it shall be demonstrated that the risk is controlled to an acceptable level.

The automatic variable gauge system is defined as an interoperability constituent (point 5.3.4b) and is part of the interoperability constituent wheelset (point 5.3.2). The conformity assessment procedure is specified in point 6.1.2.6 (interoperability constituent level), point 6.1.2.2 (safety requirement) and in point 6.2.2.4a (subsystem level) of this TSI.

The track gauges the unit is compatible with shall be recorded in the technical documentation.

A description of the changeover operation in normal mode, including the type(s) of track gauge changeover facility(ies) the unit is compatible with, shall be part of the technical documentation (see also section 4.4 of this TSI).

The requirements and conformity assessments required in other sections of this TSI apply independently for each wheel position corresponding to one track gauge and have to be documented accordingly.;

- (14) in section 4.2.4.2 the text ‘Commission Regulation (EC) No 352/2009 <sup>(1)</sup>’ is replaced by the text ‘Commission Implementing Regulation (EU) No 402/20131 <sup>(1)</sup>’;
- (15) in section 4.2.4.2 the footnote ‘<sup>(1)</sup> OJ L 108, 29.4.2009, p. 4.’ is replaced by the footnote ‘<sup>(1)</sup> OJ L 121, 3.5.2013, p. 8.’;
- (16) in section 4.2.4.3.2.1, the text ‘UIC leaflet 544-1:2013’ and ‘UIC 544-1:2013’ is replaced by the text ‘UIC 544-1:2014’;
- (17) in section 4.2.4.3.2.2, the text ‘the minimum parking brake performance’ is replaced by the text ‘the minimum parking brake force’
- (18) in section 4.2.4.3.2.2, the text ‘the minimum performance of the parking brake shall be marked on the unit. The marking shall comply with clause 4.5.25 of EN 15877- 1:2012.’ is deleted;
- (19) in section 4.2.5, the text ‘EN 50125-1:1999’ is replaced by ‘EN 50125-1:2014’;
- (20) in section 4.2.6.2.1, the text ‘EN 50153:2002’ is replaced by ‘EN 50153:2014’;
- (21) in section 6.2.2.8.4, the text ‘TS 45545-7:2009’ is replaced by ‘EN 45545-7:2013’;
- (22) in section 4.2.6.2.2, the text ‘EN 50153:2002’ is replaced by ‘EN 50153:2014’;
- (23) in section 4.2.6.3, the text ‘chapter 1 of ERA technical document ERA/TD/2012-04/INT version 1.2 of 18.1.2013 published on the ERA website (<http://www.era.europa.eu>)’ is replaced by ‘Figure 11 of EN 16116-2:2013’;

(24) in Table 7 of section 4.3.3, the text 'Reference Commission Decision 2012/88/EU Annex A, Table A2, index 77' is replaced by 'Reference ERA/ERTMS/033281 rev. 4.0';

(25) Section 4.4 is replaced as follows:

#### **4.4 Operating rules**

Operating rules are developed within the procedures described in the railway undertaking safety management system. These rules take into account the documentation related to operation which forms a part of the technical file as required in Article 15(4) of and as set out in Annex IV to Directive (EU) 2016/797.

For the safety critical components (see also 4.5), the specific operational and operational traceability requirements are developed by the designers/manufacturers at design phase and through a collaboration between designers/manufacturers and the concerned railway undertakings or the concerned wagon keeper after vehicles have entered into operation.

The documentation related to operation describes the characteristics of the unit in relation to the design operating state to be considered in order to define the operating rules in normal and in various reasonably foreseeable degraded modes.

The documentation related to operation is composed of:

- a description of operation in normal mode, including the operational characteristics and limitations of the unit (e.g. vehicle gauge, maximum design speed, axle loads, brake performance, compatibility with train detection systems, permitted environmental conditions, type(s) and operation of track gauge changeover facility(ies) the unit is compatible with),
- a description of operation in degraded mode (when equipment or functions described in this TSI suffer safety failures) as far as can reasonably be predicted, together with the related acceptable limits and operating conditions of the unit that could be experienced,
- a safety critical components list: The safety critical components list shall contain the specific operational and operational traceability requirements.

The applicant shall provide the initial version of the documentation related to operating rules. This documentation might be modified later in accordance with the corresponding Union legislation, taking into account the existing operating and maintenance conditions of the unit. The Notified Body shall verify only that the documentation on operation is provided.;

(26) Section 4.5 is replaced as follows:

#### **4.5 Maintenance rules**

Maintenance is a set of activities intended to keep a functional unit in, or to restore it to a state in which it can perform its required function.

The following documents being part of the technical file as required in Article 15(4) of and as set out in Annex IV to Directive (EU) 2016/797 are necessary to undertake maintenance activities on the units:

- general documentation (point 4.5.1),
- the maintenance design justification file (point 4.5.2), and
- the maintenance description file (point 4.5.3).

The applicant shall provide the three documents described in 4.5.1, 4.5.2. and 4.5.3. This documentation might be modified later in accordance with the corresponding EU legislation, taking into account the existing operating and maintenance conditions of the unit. The Notified Body shall verify only that the documentation on maintenance is provided.

The applicant or any entity authorised by the applicant (e.g. a keeper) shall provide this documentation to the entity in charge of maintenance as soon as it is assigned for the maintenance of the unit.

On the basis of these three documents, the entity in charge of maintenance shall define a maintenance plan and appropriate maintenance requirements at maintenance operational level under its sole responsibility (not in the scope of the assessment against this TSI).

The documentation includes a list of safety critical components. Safety critical components are components for which a single failure has a credible potential to lead directly to a serious accident as defined in Article 3(12) of Directive (EU) 2016/798.

The safety critical components and their specific servicing, maintenance and maintenance traceability requirements are identified by the designers/manufacturers at design phase and through a collaboration between designers/manufacturers and the concerned entities in charge of maintenance after vehicles have entered into operation.

#### 4.5.1 *General documentation*

The general documentation comprises of:

- Drawings and description of the unit and its components.
- Any legal requirement concerning the maintenance of the unit.
- Drawing of systems (electrical, pneumatic, hydraulic and control-circuit diagrams).
- Additional on-board systems (description of the systems including description of functionality, specification of interfaces and data processing and protocols).
- Configuration files for each vehicle (parts list and bill of material) to enable (in particular but not only) traceability during maintenance activities.

#### 4.5.2 *Maintenance design justification file*

The maintenance design justification file explains how maintenance activities are defined and designed in order to ensure that the rolling stock characteristics will be kept within permissible limits of use during its lifetime. The file shall give input data in order to determine the criteria for inspection and the periodicity of maintenance activities. The maintenance design justification file consists of:

- Precedents, principles and methods used to design the maintenance of the unit.
- Precedents, principles and methods used to identify the safety critical components and their specific operational, servicing, maintenance and traceability requirements.
- Limits of the normal use of the unit (e.g. km/month, climatic limits, foreseen types of loads, etc.).
- Relevant data used to design the maintenance and origin of these data (return of experience).
- Tests, investigations and calculations carried out to design the maintenance.

#### 4.5.3 *Maintenance description file*

The maintenance description file describes how maintenance activities can be conducted. Maintenance activities include, among others, inspections, monitoring, tests, measurements, replacements, adjustments and repairs.

Maintenance activities are split into:

- preventive maintenance (scheduled and controlled), and
- corrective maintenance.

The maintenance description file includes the following:

- Component hierarchy and functional description which sets up the boundaries of the rolling stock by listing all the items belonging to the product structure of that rolling stock and using an appropriate number of discrete levels. The lowest item of the hierarchy shall be a replaceable component.

- Parts list which shall contain the technical and functional descriptions of the spare parts (replaceable units). The list shall include all parts specified for changing based on condition, which may require a replacement following electrical or mechanical malfunction or which will foreseeable require a replacement after an accidental damage. Interoperability constituents shall be indicated and referenced to their corresponding declaration of conformity.
- Safety critical components list: The safety critical components list shall contain the specific servicing, maintenance and servicing/maintenance traceability requirements.
- Limit values for components which are not to be exceeded in service. It is permitted to specify operational restrictions in degraded mode (limit value reached).
- List of reference to the European legal obligations to which components or subsystems are subject.
- Maintenance plan (\*) i.e. the structured set of tasks to perform the maintenance including the activities, procedures and means. The description of this set of tasks includes:
  - (a) Disassembly/assembly instructions drawings necessary for correct assembly/disassembly of replaceable parts.
  - (b) Maintenance criteria.
  - (c) Checks and tests in particular of safety relevant parts; these include visual inspection and non-destructive tests (where appropriate e.g. to detect deficiencies that may impair safety).
  - (d) Tools and materials required to undertake the task.
  - (e) Consumables required to undertake the task.
  - (f) Personal protective safety provision and equipment.
- Necessary tests and procedures to be undertaken after each maintenance operation before re-entry into service of rolling stock.

(\*) The maintenance plan shall take into accounts the findings of the ERA Task force on Freight Maintenance (see “Final report on the activities of the Task Force Freight Wagon Maintenance” published on the ERA website <http://www.era.europa.eu>);

(27) in section 4.8, the text ‘GIC1 and GIC2’ is replaced by ‘GI1 and GI2’;

(28) a new section 4.9 is added as follows:

**‘4.9 Route compatibility checks before the use of authorised vehicles**

The parameters of the subsystem “rolling stock — freight wagons” to be used by the railway undertaking, for the purpose of route compatibility check, are described in Appendix D1 of Commission Implementing Regulation (EU) 2019/773 (\*)

(\*) Commission Implementing Regulation (EU) 2019/773 of 16 May 2019 on the technical specification for interoperability relating to the operation and traffic management subsystem of the rail system within the European Union and repealing Decision 2012/757/EU (OJ L 139 I, 27.5.2019, p. 5).;

(29) in section 5.3.1, the text ‘The running gear shall be designed for an application range, the area of use, as defined by the following parameters:’ is replaced as follows:

‘The running gear shall be designed for all application ranges, the areas of use, as defined by the following parameters:

- Track gauge’;

(30) in section 5.3.2, the text ‘The wheelset shall be assessed and designed for the area of use as defined by’ is replaced as follows:

‘For the purpose of this TSI, wheelsets include the main parts ensuring the mechanical interface with the track (wheels and connecting elements: e.g. transverse axle, independent wheel axle). Accessories parts (axle bearings, axle boxes and brake discs) are assessed at subsystem level.

The wheelset shall be assessed and designed for the area of use as defined by:

— track gauge;’

(31) in section 5.3.3, the text: ‘— maximum speed and service life, and’ is replaced as follows:

‘— maximum speed,

— in-service limits, and’

(32) a new section 5.3.4b is added below section 5.3.4a:

‘5.3.4b. *Automatic variable gauge system*

An IC “automatic variable gauge system” shall be designed and assessed for an area of use defined by:

— the track gauges the system is designed for,

— the range of maximum static axle loads,

— the range of nominal wheel tread diameters,

— the maximum design speed of the unit, and

— the types of track gauge changeover facility(ies) the system is designed for, including the nominal speed through the track changeover facility(ies) and the maximum axial forces during the automatic gauge changeover process.

An automatic variable gauge system shall comply with the requirements set out in point 4.2.3.6.6; these requirements shall be assessed at IC level as set out in point 6.1.2.6.’

(33) in section 6.1.2, Table 9, a new row 4.2.3.6.6 is added below the row ‘4.2.3.6.4 Axle’

‘4.2.3.6.6	Automatic variable gauge system	X (*)	X	X	X (*)	X	X (**)
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(34) in section 6.1.2, the following text is added after the last paragraph:

‘In case of a specific case applicable to a component defined as interoperability constituent in section 5.3 of this TSI, the corresponding requirement can be part of the verification at interoperability constituent level only in the case where the component remains compliant to the chapters 4 and 5 of this TSI and where the specific case does not refer to a national rule (i.e. additional requirement compatible with the core TSI and fully specified in the TSI).

In other cases, the verification shall be made at subsystem level; when a national rule applies to a component, the concerned Member State may define relevant applicable conformity assessment procedures.’;

(35) the section 6.1.2.1 is replaced as follows:

‘6.1.2.1. *Running gear*

The demonstration of conformity for running dynamic behaviour is set out in EN 16235:2013.

Units equipped with an established running gear as described in chapter 6 of EN 16235:2013 are presumed to be in conformity with the relevant requirement provided that the running gears are operated within their established area of use.

The assessment of the bogie frame strength shall be based on clause 6.2 of EN 13749:2011.’;

(36) in section 6.1.2.2, the last paragraph is replaced as follows:

‘A verification procedure shall exist to ensure at the assembly phase that no defects may detrimentally affect safety due to any change in the mechanical characteristics of the fitted parts of the axle. This procedure shall contain the determination of the interference values and, in case of press-fitted wheelsets, the corresponding press-fitting diagram.’;



(37) in section 6.1.2.5, four instances of text ‘ERA/TD/2013-02/INT version 2.0 of XX.XX.2014’ are replaced by the text ‘ERA/TD/2013-02/INT version 3.0 of 27.11.2015’;

(38) a new section 6.1.2.6 is added below the section 6.1.2.5:

‘6.1.2.6. Automatic variable gauge system

The assessment procedure shall be based on a validation plan covering all aspects mentioned in points 4.2.3.6.6 and 5.3.4b.

The validation plan shall be consistent with the safety analysis required in clause 4.2.3.6.6 and shall define the assessment needed in all the following different phases:

- Design review
- Static tests (bench tests and integration-in-the-wheelset/unit tests)
- Test on track gauge changeover facility(ies), representative of in-service conditions
- On-track tests, representative of in-service conditions.

Regarding the demonstration of compliance to the safety level required in point 4.2.3.6.6, the assumptions considered for the safety analysis related to the unit the system is intended to be integrated in, and related to the mission profile of that unit, shall be clearly documented.

The automatic variable gauge system may be subject to an assessment of suitability for use (module CV). Before commencing in-service tests, a suitable module (CB or CH1) shall be used to certify the design of the interoperability constituent. The in-service tests shall be organised on request from the manufacturer, who must obtain an agreement from a railway undertaking for its contribution to such assessment.

The certificate delivered by the notified body in charge of the conformity assessment shall include both the conditions for use as per clause 5.3.4b and the type(s) and operating conditions of the track gauge changeover facility(ies) the automatic variable gauge system has been assessed for.;

(39) In section 6.2.2.1, the text ‘The demonstration of conformity shall be in accordance with Chapters 6 and 7 of EN 12663-2:2010.’ is replaced by ‘The demonstration of conformity shall be in accordance with chapters 6 and 7 of EN 12663-2:2010, or alternatively with chapter 9.2 of EN 12663-1:2010+A1:2014.’;

(40) section 6.2.2.2 is replaced as follows:

‘6.2.2.2. Safety against derailment running on twisted track

The demonstration of conformity shall be carried out in accordance with chapters 4, 5 and 6.1 of EN 14363:2016.’;

(41) section 6.2.2.3 is replaced as follows:

‘6.2.2.3. Running dynamic behaviour

*On-track tests*

The demonstration of conformity shall be carried out in accordance with chapters 4, 5 and 7 of EN 14363:2016.

For units operated on the 1 668 mm track gauge network, the evaluation of the estimated value for the guiding force normalized to the radius  $R_m = 350$  m according to EN 14363:2016, clause 7.6.3.2.6 (2), shall be calculated according to the following formula:

$$Y_{a,nf,qst} = Y_{a,f,qst} - (11\,550 \text{ m}/R_m - 33) \text{ kN.}$$

The limit value of the quasi-static guiding force  $Y_{j,a,qst}$  shall be 66 kN.

Values of cant deficiency can be adapted to 1 668 mm track gauge by multiplying the corresponding 1 435 mm parameter values by the following conversion factor: 1 733/1 500.

The combination of the highest equivalent conicity and speed for which the unit meets the stability criterion in chapters 4, 5 and 7 of EN 14363:2016 shall be recorded in the report.’;

(42) in section 6.2.2.4, following text is added below the text:

‘It is permitted to use other standards for the above demonstration of conformity where the EN standards do not cover the proposed technical solution; in that case the notified body shall verify that the alternative standards form part of a technically consistent set of standards applicable to the design, construction and testing of the bearings.

Only standards that are publicly available can be referred to in the demonstration required above.

In the case of bearings manufactured according to a design developed and already used to place products on the market before the entry into force of relevant TSIs applicable to those products, the applicant is allowed to deviate from the demonstration of conformity above and refer to design review and type examination performed for previous applications under comparable conditions instead; this demonstration shall be documented and is considered as providing the same level of proof as type examination according to module SB or design examination according to module SH1.’;

(43) a new section 6.2.2.4a is added below section 6.2.2.4:

‘6.2.2.4a. Automatic variable gauge systems

The safety analysis required in point 4.2.3.6.6, and performed at IC level, shall be consolidated at the level of the unit; in particular, the assumptions made in accordance with point 6.1.2.6 may need to be reviewed to take into account the unit and its mission profile.’;

(44) in section 6.2.2.5, the text ‘for bogie units: Figure 18 of Annex H of Annex I of UIC leaflet 430-1:2012.’ is replaced by ‘for bogie units: Figure 18 of Annex H and Figures 19 and 20 of Annex I of UIC leaflet 430-1:2012.’;

(45) in section 6.2.2.8.1, the text ‘EN 1363-1:1999’ is replaced by ‘EN 1363-1:2012’;

(46) in section 6.2.2.8.2, the text: ‘Testing of the materials ignitability and flame spread properties shall be performed in accordance with ISO 5658-2:2006/Am1:2011 for which the limit value shall be  $CFE \geq 18 \text{ kW/m}^2$ . For the following materials and components the fire safety requirements are deemed to comply with the required ignitability and flame spread properties:’ is replaced by ‘Testing of the materials ignitability and flame spread properties shall be performed in accordance with ISO 5658-2:2006/Am1:2011 for which the limit value shall be  $CFE \geq 18 \text{ kW/m}^2$ .

For rubber parts of bogies, the testing shall be performed in accordance with ISO 5660-1:2015 for which the limit value shall be  $MARHE \leq 90 \text{ kW/m}^2$  under the test conditions specified in reference T03.02 of Table 6 of EN 45545-2:2013+A1:2015.

For the following materials and components the fire safety requirements are deemed to comply with the required ignitability and flame spread properties:

— Wheelsets, coated or uncoated,;

(47) in section 6.2.2.8.3, the text ‘EN 50355:2003’ is replaced by ‘EN 50355:2013’;

(48) in section 6.2.2.8.3, the text ‘EN 50343:2003’ is replaced by ‘EN 50343:2014’;

(49) the section 7.1 is replaced as follows:

#### ‘7.1. Authorisation for placing on the market

This TSI is applicable to the subsystem “rolling stock — freight wagons” within the scope set out in its Sections 1.1, 1.2 and 2.1, which are placed on the market after the date of application of this TSI.

This TSI is also applicable on a voluntary basis to:

- units referred to in section 2.1 point (a) in transport (running) configuration, in case they correspond to a “unit” as defined in this TSI, and
- units as defined in section 2.1 point (c), in case they are in empty configuration.

In case the applicant chooses to apply this TSI, the corresponding EC declaration of verification shall be recognised as such by Member States.’

(50) the section 7.1.2 is replaced as follows:

#### 7.1.2 Mutual recognition of the first authorisation of placing on the market

In accordance with Article 21(3)(b) of Directive (EU) 2016/797 the authorisation for placing of the market of a vehicle (as defined in this TSI) is granted on the basis of:

- in accordance with point (a) of Article 21(3): the “EC” declaration of verification as provided for in Article 15 of the same directive, and
- in accordance with (d) of Article 21(3): evidence of the technical compatibility of the unit with the network in the area of use covering the EU network.

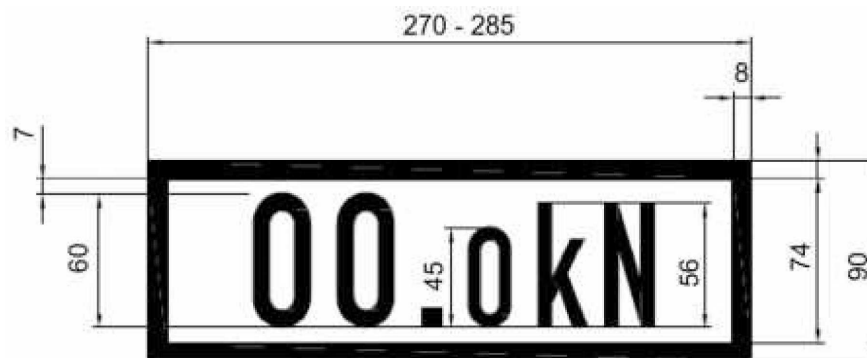
Points (b) and (c) of Article 21(3) of Directive (EU) 2016/797 do not represent any additional requirement. The technical compatibility of the vehicle with the network being covered by rules (TSIs or national rules), this aspect is also considered at the level of the “EC” verification.

Therefore, the conditions for having an area of use not limited to particular national networks are specified below as additional requirements to be covered in the EC verification of the subsystem rolling stock. These conditions shall be seen as complementary to the requirements in Section 4.2 and must be fulfilled in their entirety:

- (a) The unit must be equipped with forged and rolled wheels assessed according to point 6.1.2.3(a).
- (b) The compliance/non-compliance with the requirements regarding the axle bearing condition monitoring by line side equipment as set out in point 7.3.2.2.(a) must be recorded in the technical file.
- (c) The reference profile established for the unit as per point 4.2.3.1 must be allocated to one of the target reference profile(s) G1, GA, GB and GC including those used for the lower part GI1 and GI2.
- (d) The unit must be compatible with the train detection systems based on track circuits, on axle counters and on loop equipment as specified in clauses 4.2.3.3(a), 4.2.3.3(b) and 4.2.3.3(c).
- (e) The unit must be equipped with the manual coupling system in accordance with the prescriptions set out in Appendix C, Section 1, including the fulfilment of Section 8 or with any semi-automatic or automatic standardised coupling system.
- (f) The brake system must be in accordance with the conditions of Appendix C, Sections 9, 14 and 15 when applying the reference case set out in point 4.2.4.2.
- (g) The unit must be marked with all applicable markings in accordance with EN 15877-1:2012, except the marking defined in its clause 4.5.25(b).
- (h) The parking brake force shall be marked as set out in Figure 1, 30 mm below the marking defined in clause 4.5.3 of EN 15877-1:

Figure 1

#### Marking of the parking brake force



When an international agreement to which the European Union is party provides for reciprocal legal provisions, units which have been authorised to operate according to said international agreement and comply with all requirements set out in section 4.2 and in this point 7.1.2 shall be deemed as authorised for placing on the market in the Member States of the European Union.;

(51) section 7.2 is replaced as follows:

**7.2 General rules for implementation**

**7.2.1 Substitution of constituents**

This section deals with substitutions of constituents as referred to in Article 2 of Directive (EU) 2016/797.

The following categories have to be considered:

**Certified ICs:** Components which correspond to an IC in Chapter 5 and which are holding a certificate of conformity.

**Other components:** Any component, which is not corresponding to an IC in Chapter 5.

**Non-certified ICs:** Components which correspond to an IC in Chapter 5 but are not holding a certificate of conformity and which are produced before the expiry of the transitional period referred to in Section 6.3.

Table 11 shows the possible permutations.

Table 11

**Substitution permutation table**

	... substituted by ...		
	... certified ICs	... other components	... non-certified ICs
Certified ICs ...	Check	not possible	check
Other components ...	not possible	check	not possible
Non-certified ICs ...	Check	not possible	check

The word “check” in Table 11 means that the entity in charge of maintenance (ECM) may under its responsibility substitute a component by another one utilising the same function and at least the same performance in accordance with the relevant TSI requirements considering that these components are:

- suitable, i.e. conform to the relevant TSI(s),
- used within its area of use,
- enabling interoperability,
- meeting the essential requirements, and
- in line with restrictions stated in the technical file.

**7.2.2 Changes to an existing unit or to an existing unit type**

**7.2.2.1 Introduction**

This point 7.2.2 defines the principles to be applied by the entities managing the change and authorising entities in line with the EC verification procedure described in Article 15(9), Article 21(12) and Annex IV of Directive (EU) 2016/797. This procedure is further developed in Article 13, 15 and 16 of Commission Implementing Regulation (EU) 2018/545 (\*) and in Commission Decision 2010/713/EC (\*\*).

This point 7.2.2 applies in case of any change(s) to an existing unit or unit type, including renewal or upgrade. It does not apply in case of changes:

- that do not introduce a deviation from the technical files accompanying the EC declarations for verification for the subsystems, if any, and
- that do not have an impact on basic parameters not covered by the EC declaration, if any.

The holder of the vehicle type authorisation shall provide, under reasonable conditions, the information necessary for assessing the changes to the entity managing the change.

#### 7.2.2.2 Rules to manage changes in both a unit or a unit type

Parts and basic parameters of the unit that are not affected by the change(s) are exempt from conformity assessment against the provisions in this TSI.

Without prejudice to clause 7.2.2.3, compliance with the requirements of this TSI or the TSI Noise (Commission Regulation (EU) No 1304/2014 (\*\*\*) , see clause 7.2 of that TSI) shall only be needed for the basic parameters in this TSI which may be affected by the change(s).

In accordance with Articles 15 and 16 of Commission Implementing Regulation (EU) 2018/545 and Decision 2010/713/EU and by application of modules SB, SD/SF or SH1 for the EC verification, and if relevant in accordance with Article 15(5) of Directive (EU) 2016/797, the entity managing the change shall inform a notified body of all changes affecting the conformity of the subsystem with requirements of the relevant TSI(s) requiring new checks by a notified body. This information shall be provided by the entity managing the change with corresponding references to the technical documentation relating to the existing EC type or design examination certificate.

Without prejudice of the general safety judgement mandated in article 21(12)(b) of Directive (EU) 2016/797, in case of changes requiring reassessment of the safety requirements set out in clauses 4.2.4.2 for the brake system, a new authorization for placing on the market will be required unless one of the following conditions are met:

- The brake system fulfils the conditions of C.9 and C.14 of Appendix C after change or,
- Both the original and changed brake systems fulfil the safety requirements set out in clause 4.2.4.2.

National migration strategies related to the implementation of other TSIs (e.g. TSIs covering fixed installations) shall be taken into account when defining to what extent the TSIs covering rolling stock needs to be applied.

The basic design characteristics of the rolling stock are defined in Table 11a. Based on these tables and on the safety judgement mandated in Article 21(12)(b) of Directive (EU) 2016/797, the changes shall be categorised as follows:

- 15(1)(c) of Commission Implementing Regulation (EU) 2018/545 if they are above the thresholds set out in column 3 and below thresholds set out in column 4 unless the safety judgement mandated in Article 21(12)(b) of Directive (EU) 2016/797 requires to categorise them as 15(1)(d), or
- 15(1)(d) of Commission Implementing Regulation (EU) 2018/545 if they are above the thresholds set out in column 4 or if the safety judgement mandated in Article 21(12)(b) of Directive (EU) 2016/797 requires to categorise them as 15(1)(d).

The determination whether the changes are beyond or above the thresholds mentioned above shall be done in reference to the values of the parameters at the time of the last authorisation of the rolling stock or rolling stock type.

Changes not referred to in the paragraph above are deemed not to have any impact on the basic design characteristics and will be categorised as 15(1)(a) or 15(1)(b) of Commission Implementing Regulation (EU) 2018/545, unless the safety judgement mandated in Article 21(12)(b) of Directive (EU) 2016/797 requires to categorise them as 15(1)(d).

The safety judgement mandated in Article 21(12)(b) of Directive (EU) 2016/797 shall cover all changes concerning basic parameters of table 1, related to all the essential requirements, in particular the requirements “Safety” and “Technical compatibility”.

Without prejudice to clause 7.2.2.3, all changes shall remain compliant with the applicable TSIs regardless their classification.

The replacement of a whole element within a rake of permanently connected elements after a severe damage does not require a conformity assessment against this TSI, as long as the element is identical to the one it replaces. Such element must be traceable and certified in accordance with any national or international rule, or any code of practice widely acknowledged in the railway domain.

Table 11a

**Basic design characteristics related to basic parameters set out in the WAG TSI**

1. TSI clause	2. Related basic design characteristic(s)	3. Changes impacting the basic design characteristic and not classified as 21(12)(a) of Directive (EU) 2016/797	4. Changes impacting the basic design characteristic and classified as 21(12)(a) of Directive (EU) 2016/797
4.2.2.1.1 End coupling	Type of end coupling	Change of end coupler type	N/A
4.2.3.1 Gauging	Reference profile	N/A	Change of reference profile the vehicle is conform to
	Minimum vertical convex curve radius capability	Change in minimum vertical convex curve radius capability the unit is compatible with of more than 10 %	N/A
	Minimum vertical concave curve radius capability	Change in minimum vertical concave curve radius capability the unit is compatible with of more than 10 %	N/A
4.2.3.2. Compatibility with load carrying capacity of lines	Permissible payload for different line categories	Change (!) of any of the vertical loading characteristics resulting in a change of the line category (ies) the wagon is compatible with	N/A
4.2.3.3 Compatibility with train detection systems	Compatibility with train detection systems	N/A	Change of declared compatibility with one or more of the three train detection systems: Track circuits Axle counters Loop equipment
4.2.3.4 Axle bearing condition monitoring	On-board detection system	N/A	Fitting/Removal of on-board detection system

1. TSI clause	2. Related basic design characteristic(s)	3. Changes impacting the basic design characteristic and not classified as 21(12)(a) of Directive (EU) 2016/797	4. Changes impacting the basic design characteristic and classified as 21(12)(a) of Directive (EU) 2016/797
4.2.3.5 Running safety	Combination of maximum speed and maximum cant deficiency for which the unit was assessed	N/A	Increase in maximum speed of more than 15 km/h or change of more than $\pm 10\%$ in maximum admissible cant deficiency
	Rail inclination	N/A	Change of rail inclination the vehicle is conform to <sup>(2)</sup>
4.2.3.6.2 Characteristics of wheelsets	Wheelset gauge	N/A	Change of track gauge the wheelset is compatible with
4.2.3.6.3 Characteristics of wheels	Minimum required in-service wheel diameter	Change of minimum required in-service diameter of more than 10 mm	N/A
4.2.3.6.6 Automatic variable gauge systems	Wheelset gauge changeover facility	Change in the unit leading to a change in the changeover facility(ies) the wheelset is compatible with	Change of track gauge(s) the wheelset is compatible with
4.2.4.3.2.1 Service brake	Stopping distance	Change of stopping distance of more than $\pm 10\%$ Note: Brake weight percentage (also called "lambda" or "braked mass percentage") or braked mass may also be used, and can be derived (directly or via stopping distance) from deceleration profiles by a calculation. The allowed change is the same ( $\pm 10\%$ )	N/A
	Maximum deceleration for the load condition 'maximum speed under normal payload at the maximum design speed	Change of more than $\pm 10\%$ on the maximum average brake deceleration	N/A
4.2.4.3.2.2 Parking brake	Parking brake	Parking brake function installed/removed	N/A
4.2.4.3.3 Thermal capacity	Thermal capacity expressed in terms of Speed Gradient Brake distance	N/A	New reference case declared
4.2.4.3.4 Wheel slide protection (WSP)	Wheel slide protection	N/A	Fitting/removal of WSP function

1. TSI clause	2. Related basic design characteristic(s)	3. Changes impacting the basic design characteristic and not classified as 21(12)(a) of Directive (EU) 2016/797	4. Changes impacting the basic design characteristic and classified as 21(12)(a) of Directive (EU) 2016/797
4.2.5 Environmental conditions	Temperature range	Change of temperature range (T1, T2, T3)	N/A
	Snow, ice and hail conditions	Change of the selected range "snow, ice and hail" (nominal or severe)	N/A

(1) Change of the loading characteristics is not to be re-assessed in operation (loading/unloading of the wagon)

(2) The rolling stock fulfilling one of the following conditions are deemed to be compatible with all rail inclinations:

- Rolling stock assessed according to EN 14363:2016
- Rolling stock assessed according to EN 14363:2005 (amended or not amended by ERA/TD/2012-17/INT) or UIC 518:2009 with the result, that there is no restriction to one rail inclination
- vehicles assessed according to EN 14363:2005 (amended or not amended by ERA/TD/2012-17/INT) or UIC 518:2009 with the result, that there is a restriction to one rail inclination and a new assessment of the wheel-rail-contact test conditions based on real wheel- and rail profiles and measured track gauge show compliance with the requirements on wheel-rail-contact conditions of EN 14363:2016

In order to establish the EC type or design examination certificate, the notified body selected by the entity managing the change is permitted to refer to:

The original EC type or design examination certificate for parts of the design that are unchanged or those that are changed but do not affect the conformity of the subsystem, as far as it is still valid (during 10 years phase B period).

Additional EC type or design examination certificate (amending the original certificate) for modified parts of the design that affect the conformity of the subsystem with the latest revision of this TSI in force at that time.

In any case, the entity managing the change shall ensure that the technical documentation which is relating to the EC type or design examination certificate is updated accordingly.

The updated technical documentation, related to the EC type or design examination certificate is referred to in the technical file accompanying the EC declaration of verification issued by the entity managing the change for rolling stock declared as conformant to the modified type.

#### 7.2.2.3 Particular rules for existing units not covered by an EC declaration of verification with a first authorisation for placing in service before 1 January 2015

The following rules apply, in addition to clause 7.1.2.2, to existing units with a first authorisation for placing in service before 1 January 2015, where the scope of the change has an impact on basic parameters not covered by the EC declaration

The compliance with technical requirements of this TSI is deemed established when a basic parameter is improved in the direction of the TSI defined performance and the entity managing the change demonstrates that the corresponding essential requirements are met and the safety level is maintained and, where reasonably practicable, improved. The entity managing the change shall in this case justify the reasons for which the TSI defined performance was not met, taking into account migration strategies of other TSIs as stated in section 7.2.2.2. This justification shall be in the technical file, if any, or in the original technical documentation of the unit.

The particular rule set out in the above paragraph is not applicable in changes impacting the basic design characteristics and classified as 21(12)a set out in table 11b. For those changes, compliance with the TSI requirements is mandatory.



Table 11b

**Changes to basic parameters for which compliance with TSI requirements is mandatory for rolling stock not holding an EC type or design examination certificate**

TSI clause	Related basic design characteristic(s)	Changes impacting the basic design characteristic and classified as 21(12)(a) of Directive (EU) 2016/797
4.2.3.1 Gauging	Reference profile	Change of reference profile the unit is conform to
4.2.3.3 Compatibility with train detection systems	Compatibility with train detection systems	Change of declared compatibility with one or more of the three train detection systems: Track circuits Axle counters Loop equipment
4.2.3.4 Axle bearing condition monitoring	On-board detection system	Fitting/Removal of on-board detection system
4.2.3.6.2 Characteristics of wheelsets	Wheelset gauge	Change of track gauge the wheelset is compatible with
4.2.3.6.6 Automatic variable gauge systems	Wheelset gauge changeover facility	Change of track gauge(s) the wheelset is compatible with

### 7.2.3 Rules related to the EC type or design examination certificates

#### 7.2.3.1 Rolling stock subsystem

This point concerns a rolling stock type (unit type in the context of this TSI), as defined in Article 2(26) of Directive (EU) 2016/797, which is subject to an EC type or design verification procedure in accordance with section 6.2 of this TSI. It also applies to the EC type or design verification procedure in accordance with the TSI Noise, which refers to this TSI for its scope of application to freight units.

The TSI assessment basis for an EC type or design examination is defined in columns “Design review” and “Type test” of Appendix F of this TSI and of Appendix C of the TSI Noise.

##### 7.2.3.1.1 Phase A

Phase A starts once a notified body, which is responsible for EC verification, is appointed by the applicant and ends when the EC type or design examination certificate is issued.

The TSI assessment basis for a type is defined for a phase A period, with a duration of maximum four years. During the phase A period the assessment basis for EC verification to be used by the notified body will not change.

When a revision of this TSI or of the TSI Noise comes into force during the phase A period, it is permissible (but not mandatory) to use the revised version(s), either totally or for particular sections, unless explicitly otherwise specified in the revision of these TSIs. In case of application limited to particular sections, the applicant has to justify and document that applicable requirements remain consistent, and this has to be approved by the notified body.

##### 7.2.3.1.2 Phase B

The phase B period defines the period of validity of the EC type or design examination certificate once it is issued by the notified body. During this time, units may be EC certified on the basis of conformity to type.

The EC type or design examination certificate of EC verification for the subsystem is valid for a ten-year phase B period after its issue date, even if a revision of this TSI or of the TSI Noise come into force, unless explicitly otherwise specified in the revision of these TSIs. During this period of validity, new rolling stock of the same type is permitted to be placed on the market on the basis of an EC declaration of verification referring to the type certificate of verification.

The updated technical documentation related to the EC type or design examination certificate is referred to in the technical file accompanying the EC declaration of verification issued by the applicant for rolling stock declared as conformant to the modified type.

### 7.2.3.2 Interoperability constituents

This point concerns interoperability constituents which are subject to EC type examination (module CB), design examination (module CH1) or to suitability for use (module CV) in accordance with section 6.1 of this TSI.

The EC type or design examination or suitability for use certificate is valid for a ten-year period. During this time, new constituents of the same type are permitted to be placed on the market without a new type assessment, unless explicitly otherwise specified in the revision of this TSI. Before the end of the ten-year period, the constituent shall be assessed according to the latest revision of this TSI in force at that time, for those requirements that have changed or are new in comparison to the certification basis.

(\*) Commission Implementing Regulation (EU) 2018/545 of 4 April 2018 establishing practical arrangements for the railway vehicle authorisation and railway vehicle type authorisation process pursuant to Directive (EU) 2016/797 of the European Parliament and of the Council (OJ L 90, 6.4.2018, p. 66).

(\*\*) Commission Decision 2010/713/EU of 9 November 2010 on modules for the procedures for assessment of conformity, suitability for use and EC verification to be used in the technical specifications for interoperability adopted under Directive 2008/57/EC of the European Parliament and of the Council (OJ L 319, 4.12.2010, p. 1).

(\*\*\*) Commission Regulation (EU) No 1304/2014 of 26 November 2014 on the technical specification for interoperability relating to the subsystem 'rolling stock — noise' amending Decision 2008/232/EC and repealing Decision 2011/229/EU (OJ L 356, 12.12.2014, p. 421).;

(52) in section 7.2.2.2, a new footnote '(<sup>1</sup>) OJ L 356, 12.12.2014, p. 421.' is added in the same page as text 'Commission Regulation (EU) No 1304/2014 (<sup>1</sup>)';

(53) section 7.3.1 is replaced as follows:

'The specific cases, as listed in point 7.3.2, are classified as:

— "P" cases: "permanent" cases.

— "T" cases: "temporary" cases, where the target system shall be reached by 31 December 2025.

All specific cases and their relevant dates shall be re-examined in the course of future revisions of the TSI with a view to limiting their technical and geographical scope based on an assessment of their impact on safety, interoperability, cross border services, TEN-T corridors, and the practical and economic impacts of retaining or eliminating them. Special account shall be given to availability of EU funding.

Specific cases shall be limited to the route or network where they are strictly necessary and taken account of through route compatibility procedures.

In case of a specific case applicable to a component defined as interoperability constituent in section 5.3 of this TSI, the conformity assessment has to be performed according to point 6.1.2.;

(54) section 7.3.2.1a. is added:

'7.3.2.1a Gauging (point 4.2.3.1)

*Specific case Ireland and UK for Northern Ireland*

("P") It is permissible for the reference profile of the upper and the lower part of the unit to be established in accordance with the national technical rules notified for this purpose.

This specific case does not prevent access of any TSI compliant rolling stock as long as it is also compatible with an IRL gauge (track gauge system 1 600 mm).;

(55) in section 7.3.2.2, the following text is deleted:

*'(b) Specific case Portugal'*

("P") Units intended to operate on the Portuguese railway network shall be compliant with the target and prohibitive zones as set out in table 13.

Table 13

**Target and prohibitive zone for units intended to be operated in Portugal**

	Y <sub>TA</sub> [mm]	W <sub>TA</sub> [mm]	L <sub>TA</sub> [mm]	Y <sub>PZ</sub> [mm]	W <sub>PZ</sub> [mm]	L <sub>PZ</sub> [mm]
Portugal	1 000	≥ 65	≥ 100	1 000	≥ 115	≥ 500'

(56) in section 7.3.2.3, the text 'EN 14363:2005 point 4.1.3.4.1' is replaced by 'EN 14363:2016 clause 6.1.5.3.1';

(57) in section 7.3.2.3, the following text is added below the text:

'This specific case does not prevent the access of TSI compliant rolling stock to the national network.';

(58) section 7.3.2.4, 'Running dynamic behaviour (point 4.2.3.5.2)' is replaced by:

*'Specific case UK for Great Britain'*

("P") Base condition for use of simplified measuring method specified in EN 14363:2016 clause 7.2.2 should be extended to nominal static vertical wheelset forces (PF0) up to 250 kN. For technical compatibility with the existing network it is permissible to use national technical rules amending EN 14363:2016 and notified for the purpose of running dynamic behaviour.

This specific case does not prevent the access of TSI compliant rolling stock to the national network.

*Specific case Ireland and UK for Northern Ireland*

("P") For technical compatibility with the existing 1 600 mm track gauge network it is permissible to use notified national technical rules for the purpose of assessing running dynamic behaviour.

This specific case does not prevent the access of TSI compliant rolling stock to the national network.';

(59) section 7.3.2.5, 'Characteristics of wheelsets (points 4.2.3.6.2)' is replaced by:

*'7.3.2.5 Characteristics of wheelsets, wheels and axles (points 4.2.3.6.2 and 4.3.2.6.3)*

*Specific case UK for Great Britain*

("P") For units intended to operate solely on the railway network of Great Britain the characteristics of the wheelsets, wheels and axles may be in accordance with the national technical rules notified for this purpose.

This specific case does not prevent the access of TSI compliant rolling stock to the national network.';

(60) section 7.3.2.6, 'Characteristics of wheels (point 4.2.3.6.3)' is deleted;

(61) section 7.3.2.7 is re-numbered 7.3.2.6. The text of the section is replaced by:

*'Attachment devices for rear end signals (point 4.2.6.3)*

*Specific case Ireland and UK for Northern Ireland*

("P") The attachment devices for rear-end signals on units intended to be operated only in traffic on networks with 1 600 mm track gauge shall conform with the national rules notified for the purpose.

This specific case does not prevent the access of TSI compliant rolling stock to the national network.'

(62) section 7.3.2.7 is added:

‘7.3.2.7. Rules to manage changes in both rolling stock and rolling stock type (7.2.2.2)

*Specific case the United Kingdom (Great Britain)*

“(P”) Any change to a vehicle swept envelope as defined in the national technical rules notified for the gauging process (for example as described in RIS-2773-RST) will be categorised as 15(1)(c) of Implementing Regulation (EU) 2018/545, and will not be classified as 21(12)(a) of Directive (EU) 2016/797.’

(63) A new section 7.6 is added as follows:

‘7.6. **Aspects that have to be considered in the revision process or in other activities of the Agency**

Further to the analysis performed during the drafting process of this TSI, particular aspects have been identified as of interest for the future development of the EU railway system.

These aspects are identified below.

7.6.1. *Rules for extension of area of use for existing rolling stock not covered by an EC declaration of verification*

Pursuant to Article 54(2) and (3) of Directive (EU) 2016/797, vehicles authorised for placing in service prior to 15 June 2016 shall receive an authorization for placing on the market according to Article 21 of Directive (EU) 2016/797 in order to operate on one or more networks which are not yet covered by their authorisation. Such vehicles shall thus be conform to this TSI or benefit from a non-application of this TSI pursuant to Article 7(1) of Directive 2016/797/EC.

In order to facilitate the free movement of vehicles, provisions shall be developed to set out which level of flexibility could be granted to such vehicles as well as to vehicles which were not subject to authorization, as regards compliance with the TSI requirements while fulfilling the essential requirements, maintaining the appropriate safety level, and where reasonably practicable, improving it.’;

(64) In Appendix A, the complete text is replaced by ‘Not used’;

(65) In Appendix C, condition C.1 ‘Manual coupling system’, the text ‘The clearance for the draw hook shall be in accordance with chapter 2 of ERA technical document ERA/TD/2012-04/INT version 1.2 of 18.1.2013 published on the Agency website (<http://www.era.europa.eu>).’ is replaced by ‘The clearance for the draw hook shall be in accordance with clause 6.3.2 of EN 16116-2:2013.’;

(66) In Appendix C, condition C.1 ‘Manual coupling system’, the text ‘The space for shunting staff operation shall be in accordance with chapter 3 of ERA technical document ERA/TD/2012-04/INT version 1.2 of 18.1.2013 published on the Agency website (<http://www.era.europa.eu>).’ is replaced by ‘The space for shunting staff operation shall be in accordance with clause 6.2.1 of EN 16116- 2:2013. For manual coupling systems equipped with 550 mm wide buffers the calculation of the free space may be done considering that the coupling gear components are lateral centrally positioned (D = 0 mm as defined in Annex A of EN 16116-2:2013).’;

(67) In Appendix C, condition C.2 ‘**UIC footsteps and handrails**’ is replaced as follows:

‘2. **UIC footsteps and handrails**

The unit shall be equipped with footsteps and handrails in accordance with chapters 4 and 5 of EN 16116-2:2013 and with clearances in accordance with clause 6.2.2 of EN 16116-2:2013.’;

(68) In Appendix C, condition C.5 ‘**Marking of units**’, the following text is deleted:

‘Markings of EN 15877-1:2012 are required where applicable. The following are always applicable:

- 4.5.2 Gauge marking
- 4.5.3 Vehicle Tare Weight
- 4.5.4 Vehicle load table
- 4.5.5 Sign for length over buffers

- 4.5.12 Table of Maintenance dates
- 4.5.14 Lifting and re-railing signs
- 4.5.23 Distances between end axles and bogie centres
- 4.5.29 Brake weight.;

- (69) In Appendix C, condition C.6 '**G1 gauge**', the text 'GIC1' is replaced by 'GI1';
- (70) In Appendix C, condition C.8 '**Tests concerning longitudinal compressive forces**', the text 'EN 15839:2012' is replaced by 'EN 15839:2012+A1:2015';
- (71) In Appendix C, condition C.9 '**UIC brake**', the text 'UIC 540:2006' is replaced by the text 'UIC 540:2014' in points (c) and (e);
- (72) In Appendix C, condition C.9 '**UIC brake**', the text '(i) The pneumatic half coupling' is replaced by '(i) The pneumatic half coupling and its hose';
- (73) In Appendix C, condition C.9 '**UIC brake**', the text '(k) Brake block holders shall be in accordance with UIC leaflet 542:2010' is replaced by '(k) Brake block holders shall be in accordance with UIC 542:2015';
- (74) In Appendix C, condition C.9 '**UIC brake**', the point (m) is replaced as follows:
- '(m) Slack adjusters shall be in accordance with chapters 4 and 5 of EN 16241:2014. The assessment of conformity shall be carried out in accordance with clauses 6.3.2 to 6.3.5 of EN 16241:2014. Additionally, a life test shall be performed to demonstrate the suitability of the slack adjuster for service on the unit and to verify the maintenance requirements for the operational design life. This shall be carried out at the maximum rated load cycling through the full range of adjustment.';
- (75) In Appendix C, condition C.9 '**UIC brake**', the text 'UIC 544-1:2013' in row 'Braking mode 'G'' of Table C.3 is replaced by the text 'UIC 544-1:2014';
- (76) In Appendix C, condition C.9 '**UIC brake**', the text 'EN 14531-1:2005 section 5.11' of the footnote (1) of Table C.3 is replaced by the text 'EN 14531-1:2015 section 4';
- (77) In Appendix C, condition C.11 '**Temperature ranges for air reservoirs, hoses and grease**' is replaced as follows condition:

**'11. Temperature ranges for air reservoirs, hoses and grease**

The following requirements are deemed to comply with any temperature range indicated in point 4.2.5:

- Air reservoirs shall be designed for the temperature range of – 40 °C to + 70 °C.
- Brake cylinders and brake couplings shall be designed for the temperature range of – 40 °C to + 70 °C.
- Hoses for air brakes and air supply shall be specified for the temperature range of – 40 °C to + 70 °C.

The following requirement is deemed to comply with the range T1 indicated in point 4.2.5:

- The grease for the lubrication of roller bearing shall be specified for ambient temperatures down to – 20 °C.;

- (78) In Appendix C, condition C.12 '**Welding**' is replaced as follows condition:

'Welding shall be carried out in accordance with EN 15085-1:2007+A1:2013, EN 15085-2:2007, EN 15085-3:2007, EN 15085-4:2007 and EN 15085-5:2007.';

- (79) In Appendix C, the following text is added below the text in condition C.16 '**Tow hooks**':

'Alternative technical solutions are allowed as far as conditions 1.4.2 to 1.4.9 of UIC 535-2:2006 are respected. If the alternative solution is a cable eye bracket, it shall in addition have a minimum diameter of 85 mm.';

(80) In Appendix C, the following condition C.19 is added:

**'19. Axle bearing condition monitoring**

It shall be possible to monitor the axle bearing condition of the unit by means of line side detection equipment.';

(81) Appendix D is replaced as follows:

*'Appendix D*

**Mandatory standards or normative documents referred to in this TSI**

TSI		Standard/document	
Characteristics to be assessed		References to Standard or document	Clauses
<b>Structure and mechanical part</b>	<b>4.2.2</b>		
Strength of unit	4.2.2.2	EN 12663-2:2010	5
		EN 15877-1:2012	4.5.14
	6.2.2.1	EN 12663-1:2010+A1:2014	9.2
		EN 12663-2:2010	6, 7
<b>Gauging and track interaction</b>	<b>4.2.3</b>		
Gauging	4.2.3.1	EN 15273-2:2013	all
Compatibility with load carrying capacity of lines	4.2.3.2	EN 15528:2015	6.1, 6.2
Compatibility with train detection systems	4.2.3.3	ERA/ERTMS/033281 rev. 4.0	See table 7 of this TSI
Axle bearing condition monitoring	4.2.3.4	EN 15437-1:2009	5.1, 5.2
Safety against derailment running on twisted track	4.2.3.5.1	—	—
	6.2.2.2	EN 14363:2016	4, 5, 6.1
Running dynamic behaviour	4.2.3.5.2	EN 14363:2016	4, 5, 7
	6.1.2.1	EN 14363:2016	4, 5, 7
	6.2.2.3	EN 16235:2013	all
	6.1.2.1	EN 13749:2011	6.2
Structural design of bogie frame	4.2.3.6.1	EN 13749:2011	6.2
	6.1.2.1	EN 13749:2011	6.2
Characteristics of wheelsets	4.2.3.6.2	—	—
	6.1.2.2	EN 13260:2009+A1:2010	3.2.1

TSI		Standard/document	
Characteristics to be assessed		References to Standard or document	Clauses
Characteristics of wheels	4.2.3.6.3	—	—
	6.1.2.3	EN 13979-1:2003+A1:2009 +A2:2011	7, 6.2
Characteristics of axles	4.2.3.6.4	—	—
	6.1.2.4	EN 13103:2009 + A2:2012	4, 5, 6, 7
Axle boxes/bearings	4.2.3.6.5	—	—
	6.2.2.4	EN 12082:2007+A1:2010	6
Running gear for manual change of wheelsets	4.2.3.6.7	—	—
	6.2.2.5	UIC leaflet 430-1:2012	Annexes B, H, I
		UIC 430-3:1995	Annex 7
<b>Brake</b>	<b>4.2.4</b>		
Service brake	4.2.4.3.2.1	EN 14531-6:2009	all
		UIC 544-1:2014	all
Parking brake	4.2.4.3.2.2	EN 14531-6:2009	6
Friction element for wheel tread brakes	4.2.4.3.5	—	—
	6.1.2.5	ERA technical document ERA/TD/2013-02/INT Version 3.0 of 27.11.2015	All
<b>Environmental conditions</b>	<b>4.2.5</b>		
Environmental conditions	4.2.5	EN 50125-1:2014	4.7
	6.2.2.7	—	—
<b>System protection</b>	<b>4.2.6</b>		
Barriers	4.2.6.1.2.1	—	—
	6.2.2.8.1	EN 1363-1:2012	all
Materials	4.2.6.1.2.2	—	—
	6.2.2.8.2	ISO 5658- 2:2006/Am1:2011	all
		EN 13501-1:2007+A1:2009	all
		EN 45545-2:2013+A1:2015	Table 6
ISO 5660-1:2015		all	

TSI		Standard/document	
Characteristics to be assessed		References to Standard or document	Clauses
Cables	6.2.2.8.3	EN 50355:2013	all
		EN 50343:2014	all
Flammable liquids	6.2.2.8.4	EN 45545-7:2013	all
Protective measures against indirect contact (protective bonding)	4.2.6.2. 1	EN 50153:2014	6.4
Protective measures against direct contact	4.2.6.2. 2	EN 50153:2014	5
Attachment devices for rear-end signal	4.2.6.3	EN 16116-2:2013	Figure 11

Standards or documents referred to in the additional optional conditions set out in Appendix C:

Additional optional conditions for units	App. C	Standard/UIC leaflet/document	
Manual coupling system	C.1	EN 15566:2009+A1:2010	all (except 4.4)
		EN 15551:2009+A1:2010	all
		EN 16116-2:2013	6.2.1, 6.3.2
		EN 15877-1:2012	Figure 75
UIC footsteps and handrails	C.2	EN 16116-2:2013	4, 5, 6.2.2
Ability to be hump shunted	C.3	EN 12663-2:2010	5, 8
Tests concerning longitudinal compressive forces	C.8	EN 15839:2012+A1:2015	all
UIC brake	C.9	EN 15355:2008+A1:2010	all
		EN 15611:2008+A1:2010	all
		UIC 540:2014	all
		EN 14531-1:2015	4
		EN 15624:2008+A1:2010	all
		EN 15625:2008+A1:2010	all
		EN 286-3:1994	all
		EN 286-4:1994	all
		EN 15807:2011	all
		EN 14601:2005+A1:2010	all
		UIC 544-1:2014	all
		UIC 542:2015	all
UIC 541-4:2010	all		



Additional optional conditions for units	App. C	Standard/UIC leaflet/document	
		EN 16241:2014	4, 5, 6.3.2 to 6.3.5
		EN 15595:2009+A1:2011	all
Welding	C.12	EN 15085-1:2007+A1:2013 EN 15085-2:2007 EN 15085-3:2007 EN 15085-4:2007 EN 15085-5:2007	all
Specific product properties concerning the wheel	C.15	EN 13262:2004 +A1:2008+A2:2011	all
		EN 13979-1:2003 +A1:2009+A2:2011	all
Tow hooks	C.16	UIC 535-2:2006	1.4
Protective devices on protruding parts	C.17	UIC 535-2:2006	1.3
Label holders and attachment devices for rear end signal	C.18	UIC 575:1995	1'

- (82) In Appendix E, the text 'The lamp shall display a luminous area of at least 170 mm diameter. The lamp shall display a luminous area of at least 170 mm diameter. The reflector system shall be designed to display a lighting strength of at least 15 candela of red light along the axis of the lighting surface for an angle of opening of 15° horizontally and 5° vertically. The intensity must be at least 7.5 candela of red light.' is replaced by 'The tail lamp shall be designed to display a lighting intensity in accordance with table 8 of EN 15153-1:2013+A1:2016';
- (83) In Appendix E, the text 'EN 15153-1:2013' is replaced by 'EN 15153-1:2013+A1:2016';
- (84) In Appendix F, the row 'Variable gauge wheelsets' of Table F.1 is replaced by:

'Automatic variable gauge system	4.2.3.6.6	X	X	X	6.1.2.6/6.2.2.4a'
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## ANNEX II

The Annex to Commission Regulation (EU) No 1299/2014 is amended as follows:

(1) section 1.1 is replaced by the following:

**‘1.1. Technical Scope**

This TSI concerns the infrastructure subsystem and part of the maintenance subsystem of the Union rail system in accordance with Article 1 of Directive (EU) 2016/797.

The infrastructure and the maintenance subsystems are defined respectively in points 2.1 and 2.8 of Annex II to Directive (EU) 2016/797.

The technical scope of this TSI is further defined in Article 2(1), 2(5) and 2(6) of this Regulation.’;

(2) point (1) of section 1.3 is replaced by the following:

‘(1) In accordance with Article 4(3) of Directive (EU) 2016/797, this TSI:

- (a) indicates its intended scope (section 2);
- (b) lays down essential requirements for the infrastructure and part of the maintenance subsystems (section 3);
- (c) establishes the functional and technical specifications to be met by the infrastructure and part of the maintenance subsystems and its interfaces vis-à-vis other subsystems (section 4);
- (d) specifies the interoperability constituents and interfaces which must be covered by European specifications, including European standards, which are necessary to achieve interoperability within the Union rail system (section 5);
- (e) states, in each case under consideration, which procedures are to be used in order to assess the conformity or the suitability for use of the interoperability constituents, on the one hand, or the EC verification of the subsystems, on the other hand (section 6);
- (f) indicates the strategy for implementing this TSI (section 7);
- (g) indicates, for the staff concerned, the professional qualifications and health and safety conditions at work required for the operation and maintenance of the infrastructure subsystem, as well as for the implementation of this TSI (section 4);
- (h) indicates the provisions applicable to the existing infrastructure subsystem, in particular in the event of upgrading and renewal and, in such cases, the modification work which requires an application for a new authorisation;
- (i) indicates the parameters of infrastructure subsystem to be checked by the railway undertaking and the procedures to be applied to check those parameters after the delivery of the vehicle authorisation for placing on the market and before the first use of the vehicle to ensure compatibility between vehicles and the routes on which they are to be operated.

In accordance with Article 4(5) of the Directive (EU) 2016/797, provisions for specific cases are indicated in section 7.’;

(3) section 2.1 is replaced by the following:

**‘2.1. Definition of the infrastructure subsystem**

This TSI covers:

- (a) the infrastructure structural subsystem
- (b) the part of the maintenance functional subsystem relating to the infrastructure subsystem (that is: washing plants for external cleaning of trains, water restocking, refuelling, fixed installations for toilet discharge and electrical shore supplies).

The elements of the infrastructure subsystem are described in point 2.1 of Annex II to Directive (EU) 2016/797.

The elements of the maintenance subsystem are described in point 2.8 of Annex II to Directive (EU) 2016/797.

The scope of this TSI therefore includes the following aspects of the infrastructure subsystem:

- (a) Line layout,
- (b) Track parameters,
- (c) Switches and crossings,
- (d) Track resistance to applied loads,
- (e) Structures resistance to traffic loads,
- (f) Immediate action limits on track geometry defects,
- (g) Platforms,
- (h) Health, safety and environment,
- (i) Provision for operation,
- (j) Fixed installations for servicing trains.

Further details are set out in point 4.2.2 of this TSI;

(4) in section 2.5, the reference to 'Directive 2004/49/EC' is replaced by the reference to 'Directive (EU) 2016/798';

(5) in section 3, the reference to 'Directive 2008/57/EC' is replaced by the reference to 'Directive (EU) 2016/797';

(6) Table 1 in section 3 is replaced by the following:

*'Table 1*

**Basic Parameters of the infrastructure subsystem corresponding to the essential requirements**

TSI point	Title of TSI point	Safety	Reliability Availability	Health	Environmental protection	Technical compatibility	Accessibility
4.2.3.1	Structure gauge	1.1.1, 2.1.1				1.5	
4.2.3.2	Distance between track centres	1.1.1, 2.1.1				1.5	
4.2.3.3	Maximum gradients	1.1.1				1.5	
4.2.3.4	Minimum radius of horizontal curve	1.1.3				1.5	
4.2.3.5	Minimum radius of vertical curve	1.1.3				1.5	
4.2.4.1	Nominal track gauge					1.5	
4.2.4.2	Cant	1.1.1, 2.1.1				1.5	1.6.1
4.2.4.3	Cant deficiency	1.1.1				1.5	

TSI point	Title of TSI point	Safety	Reliability Avail- ability	Health	Environ- mental protection	Technical compati- bility	Accessi- bility
4.2.4.4	Abrupt change of cant defi- ciency	2.1.1					
4.2.4.5	Equivalent conicity	1.1.1, 1.1.2				1.5	
4.2.4.6	Railhead profile for plain line	1.1.1, 1.1.2				1.5	
4.2.4.7	Rail inclination	1.1.1, 1.1.2				1.5	
4.2.5.1	Design geometry of switches and crossings	1.1.1, 1.1.2, 1.1.3				1.5	
4.2.5.2	Use of swing nose crossings	1.1.2, 1.1.3					
4.2.5.3	Maximum unguided length of fixed obtuse crossings	1.1.1, 1.1.2				1.5	
4.2.6.1	Track resistance to vertical loads	1.1.1, 1.1.2, 1.1.3				1.5	
4.2.6.2	Longitudinal track resistance	1.1.1, 1.1.2, 1.1.3				1.5	
4.2.6.3	Lateral track resistance	1.1.1, 1.1.2, 1.1.3				1.5	
4.2.7.1	Resistance of new bridges to traffic loads	1.1.1, 1.1.3				1.5	
4.2.7.2	Equivalent vertical loading for new earthworks and earth pressure effects imposed on new structures	1.1.1, 1.1.3				1.5	
4.2.7.3	Resistance of new structures over or adjacent to tracks	1.1.1, 1.1.3				1.5	
4.2.7.4	Resistance of existing bridges and earthworks to traffic loads	1.1.1, 1.1.3				1.5	
4.2.8.1	The immediate action limit for alignment	1.1.1, 1.1.2	1.2				
4.2.8.2	The immediate action limit for longitudinal level	1.1.1, 1.1.2	1.2				
4.2.8.3	The immediate action limit for track twist	1.1.1, 1.1.2	1.2				

TSI point	Title of TSI point	Safety	Reliability Avail- ability	Health	Environ- mental protection	Technical compati- bility	Accessi- bility
4.2.8.4	The immediate action limit of track gauge as isolated defect	1.1.1, 1.1.2	1.2				
4.2.8.5	The immediate action limit for cant	1.1.1, 1.1.2	1.2				
4.2.8.6	The immediate action limit for switches and crossings	1.1.1, 1.1.2	1.2			1.5	
4.2.9.1	Usable length of platforms	1.1.1, 2.1.1				1.5	
4.2.9.2	Platform height	1.1.1, 2.1.1				1.5	1.6.1
4.2.9.3	Platform offset	1.1.1, 2.1.1				1.5	1.6.1
4.2.9.4	Track layout alongside plat- forms	1.1.1, 2.1.1				1.5	1.6.1
4.2.10.1	Maximum pressure variations in tunnels	1.1.1, 2.1.1				1.5	
4.2.10.2	Effect of cross winds	1.1.1, 2.1.1	1.2			1.5	
4.2.10.3	Aerodynamic effect on bal- lasted track	1.1.1	1.2			1.5	
4.2.11.1	Location markers	1.1.1	1.2				
4.2.11.2	Equivalent conicity in service	1.1.1, 1.1.2				1.5	
4.2.12.2	Toilet discharge	1.1.5	1.2	1.3.1		1.5	
4.2.12.3	Train external cleaning facil- ities		1.2			1.5	
4.2.12.4	Water restocking	1.1.5	1.2	1.3.1		1.5	
4.2.12.5	Refuelling	1.1.5	1.2	1.3.1		1.5	
4.2.12.6	Electric shore supply	1.1.5	1.2			1.5	
4.4	Operating rules		1.2				
4.5	Maintenance rules		1.2				
4.6	Professional qualifications	1.1.5	1.2				
4.7	Health and safety conditions	1.1.5	1.2	1.3	1.4.1'		

(7) in point (1) of section 4.1, the reference to ‘Directive 2008/57/EC’ is replaced by the reference to ‘Directive (EU) 2016/797’;

(8) point (3) of section 4.1 is replaced by the following:

‘(3) The functional and technical specifications of the infrastructure and part of the maintenance subsystems and their interfaces, as described in points 4.2 and 4.3, do not impose the use of specific technologies or technical solutions, except where this is strictly necessary for the interoperability of the Union rail system.’;

(9) the title of section 4.2 is replaced by the following

**‘4.2. Functional and technical specifications of the infrastructure subsystem’;**

(10) points (1) to (3) of section 4.2.1 are replaced by the following:

‘(1) The elements of the Union’s rail network are set out in point 1 of Annex I to Directive (EU) 2016/797. In order to deliver interoperability cost-effectively, each element of the Union’s rail network shall be assigned a “TSI category of line”.

(2) The TSI category of line shall be a combination of traffic codes. For lines where only one type of traffic is carried (for example, a freight only line), a single code may be used to describe the performances; where mixed traffic runs the category will be described by one or more codes for passenger and freight. The combined traffic codes describe the envelope within which the desired mix of traffic can be accommodated.

(3) These TSI categories of line shall be used for the classification of existing lines to define a target system so that the relevant performance parameters will be met.’;

(11) in point (7) of section 4.2.1, note (\*) of Table 3 is replaced by the following:

‘(\*) Axle load is based on design mass in working order for power heads and locomotives as defined in point 2.1 of EN 15663:2009+AC:2010 and design mass under normal payload for other vehicles in accordance with point 6.3 of EN15663:2009+AC:2010.’;

(12) point (10) of section 4.2.1 is replaced by the following:

‘(10) In accordance with Article 4(7) of Directive (EU) 2016/797 which provides that TSIs shall not prevent the Member States from deciding on the use of infrastructures for the movement of vehicles not covered by the TSIs, it is allowed to design new and upgraded lines able to accommodate:

- gauges larger,
- axle loads higher,
- speeds greater,
- usable length of platform greater,
- trains longer

than those specified in Table 2 and Table 3.’;

(13) point (c) of point H in section 4.2.2.1 is replaced by the following:

‘(c) Aerodynamic effect on ballasted track (4.2.10.3)’;

(14) in point K of section 4.2.2.1 the following point is added:

‘(b) Maintenance plan (4.5.2).’;

(15) point (5) in section 4.2.4.2 is replaced by the following:

‘(5) Instead of point (1), for the 1 668 mm track gauge system, the design cant shall not exceed 185 mm.’;

(16) point (4) in section 4.2.4.4 is replaced by the following:

'(4) Instead of point (1), for the 1 668 mm track gauge system, the maximum design values of abrupt change of cant deficiency shall be:

- (a) 150 mm for  $V \leq 45$  km/h
- (b) 115 mm for  $45 \text{ km/h} < V \leq 100$  km/h,
- (c)  $(399-V)/2.6$  [mm] for  $100 \text{ km/h} < V \leq 220$  km/h,
- (d) 70 mm for  $220 \text{ km/h} < V \leq 230$  km/h,
- (e) Abrupt change of cant deficiency is not allowed for speeds of more than 230 km/h.;

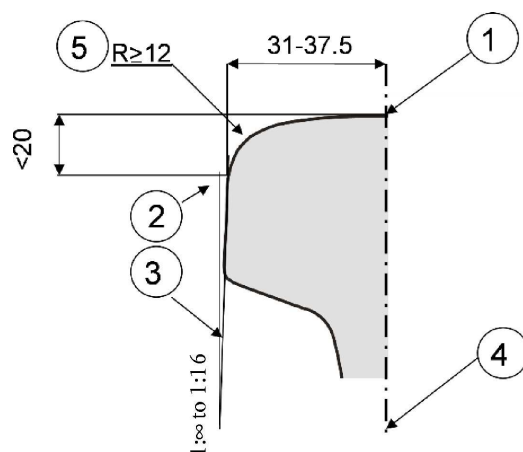
(17) point (3) in section 4.2.4.5 is replaced by the following:

'(3) Design track gauge, rail head profile and rail inclination for plain line shall be selected to ensure that the equivalent conicity limits set out in Table 10 are not exceeded.;

(18) figure 1 in section 4.2.4.6 is replaced by the following:

'Figure 1

**Railhead profile**



- 1 crown of rail
- 2 tangent point
- 3 lateral slope
- 4 vertical axis of rail head
- 5 gauge corner'

(19) point (2) in section 4.2.4.7.1 is replaced by the following:

'(2) For tracks intended to be operated at speeds greater than 60 km/h, the rail inclination for a given route shall be selected from the range  $1/20$  to  $1/40$ .;

(20) point (2) in section 4.2.6.2.2 is replaced by the following:

'(2) Provisions for the use of eddy current braking systems on track shall be defined at operational level by the infrastructure manager on the basis of the specific characteristics of the track, including switches and crossings. The conditions of use of this braking system are registered in accordance with Commission Implementing Regulation (EU) 2019/777 (\*) (RINF).

(\*) Commission Implementing Regulation (EU) 2019/777 of 16 May 2019 on the common specifications for the register of railway infrastructure and repealing Implementing Decision 2014/880/EU (OJ L 139 I, 27.5.2019, p. 312).;

(21) Table 11 in section 4.2.7.1.1 is replaced by the following:

*Table 11*

**Factor alpha ( $\alpha$ ) for the design of new structures**

Type of traffic	Minimum factor alpha ( $\alpha$ )
P1, P2, P3, P4	1,0
P5	0,91
P6	0,83
P1520	1
P1600	1,1
F1, F2, F3	1,0
F4	0,91
F1520	1,46
F1600	1,1'

(22) section 4.2.10.3 is replaced by the following:

**4.2.10.3 Aerodynamic effect on ballasted track**

- (1) The aerodynamic interaction between rolling stock and infrastructure may cause the lifting and further blowing away of ballast stones from the track bed in plain line and switches and crossings (Ballast pick up). This risk shall be mitigated.
- (2) The requirements for the infrastructure subsystem aimed at mitigating the risk for "ballast pick up" apply only to lines intended to be operated at speed greater than 250 km/h.
- (3) The requirements of point (2) above are an open point.;

(23) section 4.2.12.2 is replaced by the following:

**4.2.12.2 Toilet discharge**

Fixed installations for toilet discharge shall be compatible with the characteristics of the retention toilet system specified in the LOC & PAS TSI.;

(24) point (1) in section 4.2.12.4 is replaced by the following:

'(1) Fixed equipment for water restocking shall be compatible with the characteristics of the water system specified in the LOC & PAS TSI.;

(25) section 4.2.12.5 is replaced by the following:

**4.2.12.5 Refuelling**

Refuelling equipment shall be compatible with the characteristics of the fuel system specified in the LOC & PAS TSI.;

(26) section 4.2.12.6 is replaced by the following:

**4.2.12.6 Electrical shore supply**

Where provided, electrical shore supply shall be by means of one or more of the power supply systems specified in the LOC & PAS TSI.;



(27) Table 15 in section 4.3.1 is replaced by the following:

*Table 15*

**Interfaces with the rolling stock subsystem, “Locomotives and Passenger Rolling Stock TSI”**

Interface	Reference Infrastructure TSI	Reference Locomotives and Passenger Rolling Stock TSI
Track gauge	4.2.4.1 Nominal track gauge 4.2.5.1 Design geometry of switches and crossings 4.2.8.6 The immediate action limits for switches and crossings	4.2.3.5.2.1 Mechanical and geometrical characteristics of wheelset 4.2.3.5.2.3 Variable gauge wheelsets
Gauge	4.2.3.1 Structure gauge 4.2.3.2 Distance between track centres 4.2.3.5 Minimum radius of vertical curve 4.2.9.3 Platform offset	4.2.3.1 Gauging
Axle load and axle spacing	4.2.6.1 Track resistance to vertical loads 4.2.6.3 Lateral track resistance 4.2.7.1 Resistance of new bridges to traffic loads 4.2.7.2 Equivalent vertical loading for new earthworks and earth pressure effects imposed on new structures 4.2.7.4 Resistance of existing bridges and earthworks to traffic loads	4.2.2.10 Load conditions and weighed mass 4.2.3.2.1 Axle load parameter
Running characteristics	4.2.6.1 Track resistance to vertical loads 4.2.6.3 Lateral track resistance 4.2.7.1.4 Nosing forces	4.2.3.4.2.1 Limit values for running safely 4.2.3.4.2.2 Track loading limit values
Ride stability	4.2.4.4 Equivalent conicity 4.2.4.6 Railhead profile for plain line 4.2.11.2 Equivalent conicity in service	4.2.3.4.3 Equivalent conicity 4.2.3.5.2.2 Mechanical and geometrical characteristics of wheels
Longitudinal actions	4.2.6.2 Longitudinal track resistance 4.2.7.1.5 Actions due to traction and braking (longitudinal loads)	4.2.4.5 Braking performance
Minimum horizontal curve radius	4.2.3.4 Minimum radius of horizontal curve	4.2.3.6 Minimum curve radius Annex A, A.1 Buffers
Running dynamic behaviour	4.2.4.3 Cant deficiency	4.2.3.4.2 Running dynamic behaviour
Maximum deceleration	4.2.6.2 Longitudinal track resistance 4.2.7.1.5 Actions due to traction and braking	4.2.4.5 Braking performance

Interface	Reference Infrastructure TSI	Reference Locomotives and Passenger Rolling Stock TSI
Aerodynamic effect	4.2.3.2 Distance between track centres 4.2.7.3 Resistance of new structures over or adjacent to tracks 4.2.10.1 Maximum pressure variations in tunnels 4.2.10.3 Aerodynamic effect on ballasted track	4.2.6.2.1 Slipstream effects on passengers on platforms and on trackside workers 4.2.6.2.2 Head pressure pulse 4.2.6.2.3 Maximum pressure variations in tunnels 4.2.6.2.5 Aerodynamic effect on ballasted tracks
Crosswind	4.2.10.2 Effect of crosswinds	4.2.6.2.4 Crosswind
Installations for servicing trains	4.2.12.2 Toilet discharge 4.2.12.3 Train external cleaning facilities 4.2.12.4 Water restocking 4.2.12.5 Refuelling 4.2.12.6 Electric shore supply	4.2.11.3 Toilet discharge system 4.2.11.2.2 Exterior cleaning through a washing plant 4.2.11.4 Water refilling equipment 4.2.11.5 Interface for water refilling 4.2.11.7 Refuelling equipment 4.2.11.6 Special requirements for stabling of trains'

(28) Table 16 in section 4.3.1 is replaced by the following:

*Table 16*

**Interfaces with the rolling stock subsystem, "Freight Wagons TSI"**

Interface	Reference Infrastructure TSI	Reference Freight wagons TSI
Track gauge	4.2.4.1 Nominal track gauge 4.2.4.6 Railhead profile for plain line 4.2.5.1 Design geometry of switches and crossings 4.2.8.6 The immediate action limits for switches and crossings	4.2.3.6.2 Characteristics of wheelsets 4.2.3.6.3 Characteristics of wheels
Gauge	4.2.3.1 Structure gauge 4.2.3.2 Distance between track centres 4.2.3.5 Minimum radius of vertical curve 4.2.9.3 Platform offset	4.2.3.1 Gauging
Axle load and axle spacing	4.2.6.1 Track resistance to vertical loads 4.2.6.3 Lateral track resistance 4.2.7.1 Resistance of new bridges to traffic loads 4.2.7.2 Equivalent vertical loading for new earthworks and earth pressure effects imposed on new structures 4.2.7.4 Resistance of existing bridges and earthworks to traffic loads	4.2.3.2 Compatibility with load carrying capacity of lines

Interface	Reference Infrastructure TSI	Reference Freight wagons TSI
Running dynamic behaviour	4.2.8 Immediate action limits on track geometry defects	4.2.3.5.2 Running dynamic behaviour
Longitudinal actions	4.2.6.2 Longitudinal track resistance 4.2.7.1.5 Actions due to traction and braking (longitudinal loads)	4.2.4.3.2 Brake performance
Minimum curve radius	4.2.3.4 Minimum radius of horizontal curve	4.2.2.1 Mechanical interface
Vertical curve	4.2.3.5 Minimum radius of vertical curve	4.2.3.1 Gauging'

(29) Table 19 in section 4.3.4 is replaced by the following:

'Table 19

**Interfaces with the operation and traffic management subsystem**

Interface	Reference Infrastructure TSI	Reference Operation and Traffic Management TSI
Ride stability	4.2.11.2 Equivalent conicity in service	4.2.3.4.4 Operational quality
Use of eddy current brakes	4.2.6.2 Longitudinal track resistance	4.2.2.6.2 Braking performance
Crosswinds	4.2.10.2 Effect of crosswinds	4.2.3.6.3 Contingency arrangements
Operating rules	4.4 Operating rules	4.2.1.2.2.2 Modifications to information contained in the route book 4.2.3.6 Degraded operation
Staff competences	4.6 Professional competences	2.2.1 Staff and trains'

(30) in point (1) of section 4.4, the terms 'Article 18(3) and set out in Annex VI (point I.2.4) of Directive 2008/57/EC' are replaced by the terms 'Article 15(4) and set out in Annex IV (point 2.4) of Directive (EU) 2016/797';

(31) section 4.5.2 is replaced by the following:

*'4.5.2. Maintenance plan*

The infrastructure manager shall have a maintenance plan containing the items listed in point 4.5.1 together with at least the following:

- (a) a set of values for intervention limits and alert limits,
- (b) a statement about the methods, professional competences of staff and personal protective safety equipment necessary to be used,
- (c) the rules to be applied for the protection of people working on or near the track,
- (d) the means used to check that in-service values are respected,
- (e) the measures taken, for speed greater than 250 km/h, to mitigate the risk of ballast pick up.';

(32) point (1) in section 4.7 is replaced by the following:

‘(1) the health and safety conditions of staff required for the operation and maintenance of the infrastructure subsystem shall be compliant with the relevant European and national legislation.’;

(33) point (b) of point (2) in section 5.3.2 is replaced by the following:

‘(b) the rail fastening shall resist application of 3 000 000 cycles of the typical load applied in a sharp curve, such that the change in performance of the fastening system shall not exceed:

- 20 % in terms of clamping force,
- 25 % in terms of vertical stiffness,
- a reduction of more than 20 % in terms of longitudinal restraint.

The typical load shall be appropriate to:

- the maximum axle load the rail fastening system is designed to accommodate,
- the combination of rail, rail inclination, rail pad and type of sleepers with which the fastening system may be used.’;

(34) section 6.1.4.1 is replaced by the following:

‘6.1.4.1. Interoperability constituents subject to other European Union Directives

- (1) in accordance with Article 10(3) of Directive (EU) 2016/797, for interoperability constituents that are the subject of other legal acts of the Union covering other matters, the EC declaration of conformity or suitability for use shall state that the interoperability constituents also meet the requirements of those other legal acts;
- (2) in accordance with Annex I to Commission Implementing Regulation (EU) 2019/250 (\*), the EC declaration of conformity or suitability for use shall include a list of restrictions or conditions of use.

(\*) Commission Implementing Regulation (EU) 2019/250 of 12 February 2019 on the templates for “EC” declarations and certificates for railway interoperability constituents and subsystems, on the model of declaration of conformity to an authorised railway vehicle type and on the “EC” verification procedures for subsystems in accordance with Directive (EU) 2016/797 of the European Parliament and of the Council and repealing Commission Regulation (EU) No 201/2011 (OJ L 42, 13.2.2019, p. 9).’;

(35) in point (1) of section 6.2.1, the reference to ‘Article 18 of Directive 2008/57/EC’ is replaced by the reference to ‘Article 15 of Directive (EU) 2016/797’;

(36) point (6) of section 6.2.1 is replaced by the following:

‘(6) The applicant shall draw up the EC declaration of verification for the infrastructure subsystem in accordance with Article 15 of Directive (EU) 2016/797’;

(37) in section 6.2.4 the following point is added after point 6.2.4.14:

‘6.2.4.15. Assessment of compatibility with braking systems

The assessment of the requirements laid down in point 4.2.6.2.2(2) is not required.’;

(38) point (3) of section 6.4 is replaced by the following:

‘(3) The notified body shall include a reference to the maintenance file required by point 4.5.1 of this TSI in the technical file referred to in Article 15(4) of Directive (EU) 2016/797.’;

(39) in point (2) of section 6.5.2, the reference to ‘Article 17 of Directive 2008/57/EC’ is replaced by the reference to ‘Article 14 of Directive (EU) 2016/797’;

(40) the first paragraph in section 7 above section 7.1 is replaced by the following:

‘Member States shall develop a national plan for the implementation of this TSI, considering the coherence of the entire rail system of the European Union. This plan shall include all projects regarding new, renewal and upgrading of infrastructure subsystem, in line with the details mentioned in points 7.1 to 7.7 here below.’;

(41) section 7.3.1 is replaced by the following:

*‘7.3.1. Upgrading or renewal of a line*

- (1) In accordance with Article 2(14) of Directive (EU) 2016/797, “upgrading” means any major modification work on a subsystem or part of it which results in a change in the technical file accompanying the “EC” declaration of verification, if that technical file exists, and which improves the overall performance of the subsystem.
- (2) The infrastructure subsystem of a line is considered to be upgraded in the context of this TSI when at least the performance parameters axle load or gauge, as defined in point 4.2.1 are improved in order to meet the requirements of another traffic code.
- (3) In accordance with Article 2(15) of Directive (EU) 2016/797, “renewal” means any major substitution work on a subsystem or part of it which does not change the overall performance of the subsystem.
- (4) For this purpose, major substitution should be interpreted as a project undertaken to systematically replace elements of a line or a section of a line. Renewal differs from a substitution in the framework of maintenance, referred to in point 7.3.3 below, since it gives the opportunity to achieve a TSI compliant line. A renewal is the same case as upgrading, but without a change in performance parameters.
- (5) The scope of the upgrading or renewal of the infrastructure subsystem may cover the entire subsystem on a given line or only certain parts of the subsystem. According to Article 18(6) of Directive (EU) 2016/797, the national safety authority shall examine the project and decide whether a new authorisation for placing in service is needed.
- (6) Where a new authorisation is required, parts of the infrastructure subsystem falling under the scope of the upgrading or renewal shall comply with this TSI and shall be subject to the procedure established in Article 15 of Directive (EU) 2016/797, unless a permission for non-application of TSI is granted according to Article 7 of Directive (EU) 2016/797.
- (7) Where a new authorisation for placing in service is not required, compliance with this TSI is recommended. Where compliance is not possible, the contracting entity shall inform the Member State of the reasons thereof.’;

(42) section 7.3.2 is deleted;

(43) point (4) in section 7.3.3 is replaced by the following:

- ‘(4) In such cases, it is noted that each of the above elements taken separately cannot ensure compliance of the whole subsystem. The conformity of a subsystem can only be stated when all the elements are compliant with the TSI.’;

(44) section 7.6 is replaced by the following:

**‘7.6. Route compatibility checks before the use of authorised vehicles**

The procedure to be applied and the parameters of the infrastructure subsystem to be used by the railway undertaking, for the purpose of route compatibility check are described in point 4.2.2.5 and appendix D1 of the Annex to Commission Implementing Regulation (EU) 2019/773 (\*).

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(\* ) Commission Implementing Regulation (EU) 2019/773 of 16 May 2019 on the technical specification for interoperability relating to the operation and traffic management subsystem of the rail system within the European Union and repealing Decision 2012/757/EU (OJ L 139 I, 27.5.2019, p. 5).’;

(45) in section 7.7, after point (b) and above section 7.7.1, the following paragraph is added:

‘All specific cases and their relevant dates shall be re-examined in the course of future revisions of the TSI with a view to limiting their technical and geographical scope based on an assessment of their impact on safety, interoperability, cross border services, TEN-T corridors, and the practical and economic impacts of retaining or eliminating them. Special account shall be given to availability of EU funding.

Specific cases shall be limited to the route or network where they are strictly necessary and taken account of through route compatibility procedures.’;

(46) in section 7.7.2.1 the second paragraph is replaced by the following:

‘For platform heights of 550 mm and 760 mm, the conventional value  $b_{q0}$  of platform offset shall be calculated according to the following formulas:’;

(47) in section 7.7.8.1 the title ‘Platform height (4.2.9.3)’ is replaced by ‘Platform height (4.2.9.2)’;

(48) point (2) of section 7.7.11.1 is deleted;

(49) section 7.7.13.5 is replaced by the following:

‘7.7.13.5. Platform height (4.2.9.2)

P cases

For the nominal track gauge of 1 668 mm, for upgraded or renewed platforms the nominal platform height of 685 mm (general use) or 900 mm (urban and suburban traffic) above the running surface for radii of more than 300 m or 350 m respectively shall be allowed.’;

(50) Table 36 in Appendix A is replaced by the following:

‘Table 36

**Assessment of interoperability constituents for the EC declaration of conformity**

Characteristics to be assessed	Assessment in the following phase			
	Design and development phase			Production phase Manufacturing process + product test
	Design review	Review of manu- facturing process	Type test	Product quality (series)
5.3.1 The rail				
5.3.1.1 Railhead profile	X	n.a.	X	X
5.3.1.2 Rail steel	X	X	X	X
5.3.2 The rail fastening systems	n.a.	n.a.	X	X
5.3.3 Track sleepers	X	X	n.a.	X

(51) in Table 37 in Appendix B, the row concerning ‘Longitudinal track resistance’ is replaced by the following:

Characteristics to be assessed	Design review	Assembly before putting into service	Particular assessment procedures
‘Longitudinal track resistance (4.2.6.2)	X	n.a.	6.2.5 6.2.4.15’

(52) point (c) in Appendix C2 is replaced by the following:

‘(c) Bearer’;

(53) Appendix E is amended as follows:

(a) the second paragraph is replaced by the following:

‘EN line category is a function of axle load and geometrical aspects relating to the spacing of axles. EN line categories are set out in Annex A of EN 15528:2015.’;

(b) Table 38 is replaced by the following:

Table 38

**EN Line Category — Associated Speed <sup>(1)</sup> <sup>(6)</sup> [km/h] — Passenger traffic**

Traffic code	Passenger Carriages (including Coaches, Vans and Car Carriers) and Light Freight Wagons <sup>(2)</sup> <sup>(3)</sup>	Locomotives and Power Heads <sup>(2)</sup> <sup>(4)</sup>	Electric or Diesel Multiple Units, Power Units and Railcars <sup>(2)</sup> <sup>(5)</sup>
P1	n.a. <sup>(12)</sup>	n.a. <sup>(12)</sup>	Open Point
P2	n.a. <sup>(12)</sup>	n.a. <sup>(12)</sup>	Open Point
P3a (> 160 km/h)	A – 200 B1 – 160	D2 – 200 <sup>(11)</sup>	Open point
P3b (≤ 160 km/h)	B1 – 160	D2 – 160	C2 <sup>(18)</sup> – 160 D2 <sup>(9)</sup> – 120
P4a (> 160 km/h)	A – 200 B1 – 160	D2 – 200 <sup>(11)</sup>	Open point
P4b (≤ 160 km/h)	A – 160 B1 – 140	D2 – 160	B1 <sup>(7)</sup> – 160 C2 <sup>(8)</sup> – 140 D2 <sup>(9)</sup> – 120
P5	B1 – 120	C2 – 120 <sup>(5)</sup>	B1 <sup>(7)</sup> – 120
P6	a12		
P1520	Open point		
P1600	Open point'		

(c) note <sup>(1)</sup> is replaced by the following:

'<sup>(1)</sup> The indicated speed value in the table represents the maximum requirement for the line and may be lower in accordance with the requirements in point 4.2.1(12). When checking individual structures on the line, it is acceptable to take account of the type of vehicle and local allowed speed.';

(d) note <sup>(2)</sup> is replaced by the following:

'<sup>(2)</sup> Passenger Carriages (including Coaches, Vans, Car Carriers), Other Vehicles, Locomotives, Power Heads, Diesel and Electric Multiple Units, Power Units and Railcars are defined in the LOC & PAS TSI. Light Freight Wagons are defined as vans except that they are allowed to be conveyed in formations which are not intended to convey passengers.';

(e) note <sup>(10)</sup> is deleted;

(f) the following note <sup>(12)</sup> is added:

'<sup>(12)</sup> Taking into account the state of art of operation there is no need to define harmonized requirements to deliver an adequate level of interoperability for this type of vehicles for P1 and P2 traffic codes.';

(54) Appendix F is amended as follows:

(a) Table 40 is replaced by the following:

Table 40

**Route Availability number —Associated Speed <sup>(1)</sup> <sup>(2)</sup> [miles per hour] — Passenger traffic**

Traffic code	Passenger Carriages (including Coaches, Vans and Car Carriers) and Light Freight Wagons <sup>(2)</sup> <sup>(3)</sup> <sup>(6)</sup>	Locomotives and Power Heads <sup>(2)</sup> <sup>(4)</sup>	Electric or Diesel Multiple Units, Power Units and Railcars <sup>(2)</sup> <sup>(3)</sup> <sup>(6)</sup>
P1	n.a. <sup>(11)</sup>	n.a. <sup>(11)</sup>	Open Point
P2	n.a. <sup>(11)</sup>	n.a. <sup>(11)</sup>	Open Point
P3a (> 160 km/h)	RA1 – 125 RA2 – 90	RA7 – 125 <sup>(7)</sup> RA8 – 110 <sup>(7)</sup> RA8 – 100 <sup>(8)</sup> RA5 – 125 <sup>(9)</sup>	Open point
P3b (≤ 160 km/h)	RA1 – 100 RA2 – 90	RA8 – 100 <sup>(8)</sup> RA5 – 100 <sup>(9)</sup>	RA3 – 100
P4a (> 160 km/h)	RA1 – 125 RA2 – 90	RA7 – 125 <sup>(7)</sup> RA7 – 100 <sup>(8)</sup> RA4 – 125 <sup>(9)</sup>	Open point
P4b (≤ 160 km/h)	RA1 – 100 RA2 – 90	RA7 – 100 <sup>(8)</sup> RA4 – 100 <sup>(9)</sup>	RA3 – 100
P5	RA1 – 75	RA5 – 75 <sup>(8)</sup> <sup>(10)</sup> RA4 – 75 <sup>(9)</sup> <sup>(10)</sup>	RA3 – 75
P6	RA1		
P1600	Open point'		

(b) note <sup>(1)</sup> is replaced by the following:

'<sup>(1)</sup> The indicated speed value in the table represents the maximum requirement for the line and may be lower in accordance with the requirements in point 4.2.1(12). When checking individual structures on the line, it is acceptable to take account of the type of vehicle and local allowed speed.';

(c) note <sup>(2)</sup> is replaced by the following:

'<sup>(2)</sup> Passenger Carriages (including Coaches, Vans, Car Carriers), Other Vehicles, Locomotives, Power Heads, Diesel and Electric Multiple Units, Power Units and Railcars are defined in the LOC & PAS TSI. Light Freight Wagons are defined as vans except that they are allowed to be conveyed in formations which are not intended to convey passengers.';

(d) the following note <sup>(11)</sup> shall be added:

'<sup>(11)</sup> Taking into account the state of art of operation there is no need to define harmonized requirements to deliver an adequate level of interoperability for this type of vehicles for P1 and P2 traffic codes.';

(55) the fourth paragraph in Appendix K, immediately above Table 45, is deleted;



(56) Appendix L is deleted;

(57) the second paragraph of point P3 in Appendix P is modified by the following (normal font):

‘The vertical curve radius  $R_v$  is limited to 500 m. Heights not exceeding 80 mm shall be considered as zero within a radius  $R_v$  between 500 m and 625 m.’;

(58) Table 47 in Appendix Q is replaced by the following:

‘Table 47

**Notified national technical rules for UK-GB Specific Cases**

Specific Case	TSI Point	Requirement	NTR Ref	NTR Title
7.7.17.1	4.2.1: Table 2 & Table 3	Categories of line: Gauge	GI/RT7073	Requirements for the Position of Infrastructure and for Defining and Maintaining Clearances
			GE/RT8073	Requirements for the Application of Standard Vehicle Gauges
			GI/RT7020	GB Requirements for Platform Height, Platform Offset and Platform Width
7.7.17.2 & 7.7.17.9	4.2.3.1 & 6.2.4.1	Structure gauge	GI/RT7073	Requirements for the Position of Infrastructure and for Defining and Maintaining Clearances
			GE/RT8073	Requirements for the Application of Standard Vehicle Gauges
			GI/RT7020	GB Requirements for Platform Height, Platform Offset and Platform Width
7.7.17.3 & 7.7.17.10	4.2.3.2: Table 4 & 6.2.4.2	Distance between track centres	GI/RT7073	Requirements for the Position of Infrastructure and for Defining and Maintaining Clearances
7.7.17.4	4.2.5.3 & Appendix J	Maximum unguided length of fixed obtuse crossings	GC/RT5021	Track System Requirements
			GM/RT2466	Railway Wheelsets
7.7. 17.6	4.2.9.2	Platform height	GI/RT7020	GB Requirements for Platform Height, Platform Offset and Platform Width
7.7. 17.7 & 7.7. 17.11	4.2.9.3 & 6.2.4.11	Platform offset	GI/RT7020	GB Requirements for Platform Height, Platform Offset and Platform Width
			GI/RT7073	Requirements for the Position of Infrastructure and for Defining and Maintaining Clearances’

(59) Appendix R is replaced by the following:

‘Appendix R

**List of open points**

(1) Immediate action limits for isolated defects in alignment for speeds of more than 300 km/h (4.2.8.1).

(2) Immediate action limits for isolated defects in longitudinal level for speeds of more than 300 km/h (4.2.8.2).

- (3) The minimum allowed value of distance between track centres for the uniform structure gauge IRL3 is an open point (7.7.18.2).
- (4) EN Line Category — Associated Speed [km/h] for Traffic codes P1 (multiple units), P2 (multiple units), P3a (multiple units), P4a (multiple units), P1520 (all vehicles), P1600 (all vehicles), F1520 (all vehicles) and F1600 (all vehicles) in Appendix E, Tables 38 and 39.
- (5) Route Availability Number — Associated Speed [miles/h] for Traffic codes P1 (multiple units), P2 (multiple units), P3a (multiple units), P4a (multiple units), P1600 (all vehicles) and F1600 (all vehicles) in Appendix F, Tables 40 and 41.
- (6) Rules and drawings related to gauges IRL1, IRL2 and IRL3 are an open point (Appendix O).
- (7) The requirements for mitigating the risk for ballast pick up for speed greater than 250 km/h.:
- (60) Table 48 in Appendix S is replaced by the following:

‘Table 48

**Terms**

Defined term	TSI point	Definition
Actual point (RP)/ Praktischer Herzpunkt/ Pointe de coeur	4.2.8.6	Physical end of a crossing vee. See Figure 2, which shows the relationship between the actual point (RP) and the intersection point (IP).
Alert limit/ Auslösewert/ Limite d’alerte	4.5.2	Refers to the value which, if exceeded, requires that the track geometry condition is analysed and considered in the regularly planned maintenance operations.
Axle load/ Achsfahrmasse/ Charge à l’essieu	4.2.1, 4.2.6.1	Sum of the static vertical wheel forces exerted on the track through a wheelset or a pair of independent wheels divided by acceleration of gravity.
Braking systems independent of wheel-rail adhesion conditions	4.2.6.2.2	“Braking systems independent of wheel – rail adhesion conditions” refers to all brake systems of the rolling stock capable to develop a brake force applied to the rails independently of the wheel – rail adhesion conditions (e.g. magnetic braking systems and eddy current braking systems)
Cant/ Überhöhung/ Dévers de la voie	4.2.4.2 4.2.8.5	Difference in height, relative to the horizontal, of the two rails of one track at a particular location, measured at the centrelines of the heads of the rails.
Cant deficiency/ Überhöhungsfehlbetrag/Insuffisance de devers	4.2.4.3	Difference between the applied cant and a higher equilibrium cant.
Common crossing/ Starres Herzstück/ Coeur de croisement	4.2.8.6	Arrangement ensuring intersection of two opposite running edges of turnouts or diamond crossings and having one crossing vee and two wing rails.
Crosswind/ Seitenwind/ Vents traversiers	4.2.10.2	Strong wind blowing laterally to a line which may adversely affect the safety of trains running.

Defined term	TSI point	Definition
Design value/ Planungswert/ Valeur de conception	4.2.3.4, 4.2.4.2, 4.2.4.5, 4.2.5.1, 4.2.5.3	Theoretical value without manufacturing, construction or maintenance tolerances.
Design track gauge/ Konstruktionsspurweite/ Ecartement de conception de la voie	5.3.3	A single value which is obtained when all the components of the track conform precisely to their design dimensions or their median design dimension when there is a range.
Distance between track centres/ Gleisabstand/ Entraxe de voies	4.2.3.2	The distance between points of the centre lines of the two tracks under consideration, measured parallel to the running surface of the reference track namely the less canted track.
Dynamic lateral force/ Dynamische Querkraft/ Effort dynamique transversal	4.2.6.3	The sum of dynamic forces exerted by a wheelset on the track in lateral direction.
Earthworks/ Erdbauwerke/ Ouvrages en terre	4.2.7.2, 4.2.7.4	Soil structures and soil-retaining structures that are subject to railway traffic loading.
EN Line Category/ EN Streckenklasse/ EN Catégorie de ligne	4.2.7.4, Appendix E	The result of the classification process set out in EN 15528:2015 Annex A and referred to in that standard as "Line Category". It represents the ability of the infrastructure to withstand the vertical loads imposed by vehicles on the line or section of line for regular ("normal") service.
Equivalent conicity/ Äquivalente Konizität/ Conicité équivalente	4.2.4.5, 4.2.11.2	The tangent of the cone angle of a wheelset with coned wheels whose lateral movement has the same kinematic wavelength as the given wheelset on straight track and large-radius curves.
Fixed nose protection/ Leitweite/ Cote de protection de pointe	4.2.5.3, Appendix J	Dimension between the crossing nose and check rail (see dimension No 2 on Figure 10 below).
Flangeway depth/ Rillentiefe/ Profondeur d'ornière	4.2.8.6	Dimension between the running surface and the bottom of flangeway (see dimension No 6 on Figure 10 below).
Flangeway width/ Rillenweite/ Largeur d'ornière	4.2.8.6	Dimension between a running rail and an adjacent check or wing rail (see dimension No 5 on Figure 10 below).
Free wheel passage at check rail/wing rail entry/ Freier Raddurchlauf im Radlenker-Einlauf/Flügelschienen-Einlauf/Côte d'équilibrage du contre-rail	4.2.8.6	Dimension between the working face of the crossing check rail or wing rail and the gauge face of the running rail opposite across the gauge measured at entry to check rail or wing rail respectively.  (see dimensions No 4 on Figure 10 below). The entry to the check rail or wing rail is the point at which the wheel is allowed to contact the check rail or wing rail.

Defined term	TSI point	Definition
Free wheel passage at crossing nose/ Freier Raddurchlauf im Bereich der Herzspitze/ Cote de libre passage dans le croisement	4.2.8.6	Dimension between the working face of the crossing wing rail and check rail opposite across the gauge (see dimension No 3 on Figure 10 below).
Free wheel passage in switches/Freier Raddurchlauf im Bereich der Zungen- vorrichtung/Côte de libre passage de l'aiguillage	4.2.8.6.	Dimension from the gauge face of one switch rail to the back edge of the opposite switch rail (see dimension No 1 on Figure 10 below).
Gauge/ Begrenzungslinie/ Gabarit	4.2.1, 4.2.3.1	Set of rules including a reference contour and its associated calculation rules allowing definition of the outer dimensions of the vehicle and the space to be cleared by the infrastructure.
HBW/HBW/HBW	5.3.1.2	The non SI unit for steel hardness defined in EN ISO 6506-1:2005 Metallic materials – Brinell hardness test. Test method.
Height of check rail/ Radlenkerüberhöhung/ Surélévation du contre rail	4.2.8.6, Appendix J	Height of the check rail above the running surface (see dimension 7 on Figure 14 below).
Immediate Action Limit/Soforteingriffsschwelle/ Limite d'intervention immédiate	4.2.8, 4.5	The value which, if exceeded, requires taking measures to reduce the risk of derailment to an acceptable level.
Infrastructure Manager/ Betreiber der Infrastruktur/ Gestionnaire de l'Infrastructure	4.2.5.1, 4.2.8.3, 4.2.8.6, 4.2.11.2 4.4, 4.5.2, 4.6, 4.7, 6.2.2.1, 6.2.4, 6.4	As defined in Article 2h) of Directive 2001/14/EC of 26 February 2001 on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification (OJ L 75, 15.3.2001, p. 29).
In service value/ Wert im Betriebszustand/ Valeur en exploitation	4.2.8.5, 4.2.11.2	Value measured at any time after the infrastructure has been placed into service.
Intersection point (IP)/ Theoretischer Herzpunkt/ Point d'intersection théorique	4.2.8.6	Theoretical intersection point of the running edges at the centre of the crossing (see figure 2).
Intervention Limit/Eingriffsschwelle/ Valeur d'intervention	4.5.2	The value, which, if exceeded, requires corrective maintenance in order that the immediate action limit shall not be reached before the next inspection;
Isolated defect/ Einzelfehler/ Défaut isolé	4.2.8	A discrete track geometry fault.

Defined term	TSI point	Definition
Line speed/ Streckengeschwindigkeit/ Vitesse de la ligne	4.2.1	Maximum speed for which a line has been designed.
Maintenance file/ Instandhaltungsdossier/ Dossier de maintenance	4.5.1	Elements of the technical file relating to conditions and limits of use and instructions for maintenance.
Maintenance plan/ Instandhaltungsplan/ Plan de maintenance	4.5.2	A series of documents setting out the infrastructure maintenance procedures adopted by an Infrastructure Manager.
Multi-rail track/ Mehrschienengleis/ Voie à multi écartement	4.2.2.2	Track with more than two rails, where at least two pairs of respective rails are designed to be operated as separate single tracks, with or without different track gauges.
Nominal track gauge/ Nennspurweite/ Ecartement nominal de la voie	4.2.4.1	A single value which identifies the track gauge but may differ from the design track gauge.
Normal service/ Regelbetrieb/ Service régulier	4.2.2.2 4.2.9	The railway operating to a planned timetable service.
Passive provision/ Vorsorge für künftige Erweiterungen/Réservation pour extension future	4.2.9	Provision for the future construction of a physical extension to a structure (for example: increased platform length).
Performance Parameter/ Leistungskennwert/ Paramètre de performance	4.2.1	Parameter describing a TSI Category of Line used as the basis for the design of infrastructure subsystem elements and as the indication of the performance level of a line.
Plain line/ Freie Strecke/ Voie courante	4.2.4.5 4.2.4.6 4.2.4.7	Section of track without switches and crossings.
Point retraction/ Spitzenbeihobelung/ Dénivellation de la pointe de cœur	4.2.8.6	The reference line in a fixed common crossing can deviate from the theoretical reference line. From a certain distance to the crossing point, the reference line of the vee can, depending on the design, be retracted from this theoretical line away from the wheel flange in order to avoid contact between both elements. This situation is described in Figure 2.
Rail inclination/ Schienenneigung/ Inclinaison du rail	4.2.4.5 4.2.4.7	An angle defining the inclination of the head of a rail when installed in the track relative to the plane of the rails (running surface), equal to the angle between the axis of symmetry of the rail (or of an equivalent symmetrical rail having the same rail head profile) and the perpendicular to the plane of the rails.

Defined term	TSI point	Definition
Rail pad/ Schienenzwischenlage/ Semelle sous rail	5.3.2	A resilient layer fitted between a rail and the supporting sleeper or baseplate.
Reverse curve/ Gegenbogen/ Courbes et contre-courbes	4.2.3.4	Two abutting curves of opposite flexure or hand
Structure gauge/ Lichtraum/ Gabarit des obstacles	4.2.3.1	Defines the space in relation to the reference track that shall be cleared of all objects or structures and of the traffic on the adjacent tracks, in order to allow safe operation on the reference track. It is defined on the basis of the reference contour by application of the associated rules.
Swing nose	4.2.5.2	Within the domain of “common crossing with movable point”, the term “swing nose” identifies the part of the crossing which forms the vee and that it is moved to form a continuous running edge for either the main or the branch line.
Switch/ Zungenvorrichtung/ Aiguillage	4.2.8.6	A unit of track comprising two fixed rails (stock rails) and two movable rails (switch rails) used to direct vehicles from one track to another track.
Switches and crossings/ Weichen und Kreuzungen/ Appareil de voie	4.2.4.5, 4.2.4.7, 4.2.5, 4.2.6, 4.2.8.6, 5.2, 6.2.4.4, 6.2.4.8, 6.2.5.2, 7.3.3, Ap- pendix C and D,	Track constructed from sets of switches and individual crossings and the rails connecting them.
Through route/ Stammgleis/ Voie directe	Appendix D	In the context of switches and crossings a route which perpetuate the general alignment of the track.
Track design	4.2.6, 6.2.5, Appendix C and D	The track design consists of cross-section defining basic dimensions and track components (for example rail, rail fastenings, sleepers, ballast) used together with operating conditions with an impact on forces related to 4.2.6, such as axle load, speed and radius of horizontal curvature.
Track gauge/ Spurweite/ Ecartement de la voie	4.2.4.1, 4.2.4.5, 4.2.8.4, 5.3.3, 6.1.5.2, 6.2.4.3, Ap- pendix H	The smallest distance between lines perpendicular to the running surface intersecting each rail head profile in a range from 0 to 14 mm below the running surface.
Track twist/ Gleisverwindung/ Gauche	4.2.7.1.6 4.2.8.3, 6.2.4.9,	Track twist is defined as the algebraic difference between two cross levels taken at a defined distance apart, usually expressed as a gradient between the two points at which the cross level is measured.
Train length/ Zuglänge/ Longueur du train	4.2.1	The length of a train, which can run on a certain line in normal operation.

Defined term	TSI point	Definition
Unguided length of an obtuse crossing/ Führungslöse Stelle/ Lacune dans la traversée	4.2.5.3, Appendix J	Portion of obtuse crossing where there is no guidance of the wheel described as “unguided distance” in EN 13232-3:2003.
Usable length of a platform/Bahnsteignutzlänge/ Longueur utile de quai	4.2.1, 4.2.9.1	The maximum continuous length of that part of platform in front of which a train is intended to remain stationary in normal operating conditions for passengers to board and alight from the train, making appropriate allowance for stopping tolerances.  Normal operating conditions means that railway is operating in a non-degraded mode (e.g. rail adhesion is normal, signals are working, everything is working as planned).’

(61) index number 4 of Table 49 in Appendix T is replaced by the following:

‘4	EN 13848-1	Track geometry quality – Part 1: Characterisation of track geometry (with Amendment A1:2008)	2003 A1:2008	The immediate action limit for track twist (4.2.8.3)’
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(62) index number 9 of Table 49 in Appendix T is replaced by the following:

‘9	EN 15528	Railway applications – Line categories for managing the interface between load limits of vehicles and infrastructure	2015	Capability requirements for structures according to traffic code (Appendix E)’
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## ANNEX III

The Annex to Regulation (EU) No 1301/2014 is amended as follows:

(1) section 1.1 is replaced by the following:

**‘1.1. Technical Scope**

This TSI concerns the energy subsystem and part of the maintenance subsystem of the Union rail system in accordance with Article 1 of Directive (EU) 2016/797.

The energy and the maintenance subsystems are defined respectively in points 2.2 and 2.8 of Annex II to Directive (EU) 2016/797.

The technical scope of this TSI is further defined in Article 2 of this Regulation.’;

(2) points (1) and (2) of section 1.3 are replaced by the following:

‘(1) In accordance with Article 4(3) of Directive (EU) 2016/797, this TSI:

- (a) indicates its intended scope (section 2);
- (b) lays down essential requirements for the energy and part of the maintenance subsystems (section 3);
- (c) establishes the functional and technical specifications to be met by the energy and part of the maintenance subsystems and its interfaces vis-à-vis other subsystems (section 4);
- (d) specifies the interoperability constituents and interfaces which must be covered by European specifications, including European standards, which are necessary to achieve interoperability within the Union rail system (section 5);
- (e) states, in each case under consideration, which procedures are to be used in order to assess the conformity or the suitability for use of the interoperability constituents, on the one hand, or the EC verification of the subsystems, on the other hand (section 6);
- (f) indicates the strategy for implementing this TSI (section 7);
- (g) indicates, for the staff concerned, the professional qualifications and health and safety conditions at work required for the operation and maintenance of the energy subsystem, as well as for the implementation of this TSI (section 4);
- (h) indicates the provisions applicable to the existing energy subsystem, in particular in the event of upgrading and renewal and, in such cases, the modification work which requires an application for a new authorisation;
- (i) indicates the parameters of energy subsystem to be checked by the railway undertaking and the procedures to be applied to check those parameters after the delivery of the vehicle authorisation for placing on the market and before the first use of the vehicle to ensure compatibility between vehicles and the routes on which they are to be operated.

(2) In accordance with Article 4(5) of the Directive (EU) 2016/797, provisions for specific cases are indicated in Section 7.’;

(3) in point (3) of section 2.1, section 3 and point (1) of section 4.1, the references to ‘Directive 2008/57/EC’ are replaced by the references to ‘Directive (EU) 2016/797’;

(4) section 4.2.11(4) is replaced by:

‘(4) The curves apply to speed up to 360 km/h. For speeds above 360 km/h procedures set out in point 6.1.3 shall apply.’;

(5) section 4.4(1) is replaced by:

‘(1) Operating rules are developed within the procedures described in the infrastructure manager safety management system. These rules take into account the documentation related to operation, which forms a part of the technical file, as required in Article 15(4) and as set out in Annex IV of Directive (EU) 2016/797.’;



(6) in point (1) of section 5.1, the reference to 'Directive 2008/57/EC' are replaced by the reference to 'Directive (EU) 2016/797';

(7) section 6.2.1 is modified as follows:

(a) point (1) is replaced by:

'(1) At the request of the applicant, the notified body carries out EC verification in accordance with Article 15 of Directive (EU) 2016/797 and in accordance with the provisions of the relevant modules.:'

(b) point (4) is replaced by:

'(4) The applicant shall draw up the EC declaration of verification for the energy subsystem in accordance with Article 15(1) of and Annex IV to Directive (EU) 2016/797.:'

(8) point (c) of Section 6.3.2 is replaced by:

'(c) for those interoperability constituents, the reason(s) why the manufacturer did not provide an EC declaration of conformity and/or suitability for use before its incorporation into the subsystem, including the application of national rules notified under Article 13 of Directive (EU) 2016/797.:'

(9) the first paragraph of section 7 is replaced by:

'Member States shall develop a national plan for the implementation of this TSI, considering the coherence of the entire rail system of the European Union. This plan shall include all projects regarding new, renewal and upgrading of energy subsystem, in line with the details mentioned in points 7.1 to 7.4 here below.:'

(10) point (3) in Section 7.2.1 is deleted;

(11) section 7.3.1 *Introduction* is modified as follows:

#### '7.3.1 *Introduction*

In case this TSI shall apply to existing lines and without prejudice to point 7.4 (specific cases), the following elements shall be considered:

(a) The scope of the upgrading or renewal of the energy subsystem may cover the entire subsystem on a given line or only certain parts of the subsystem. In accordance with Article 18(6) of Directive (EU) 2016/797 the national safety authority shall examine the project and decide whether a new authorisation for placing in service is needed.

(b) Where a new authorisation is required, parts of the energy subsystem falling under the scope of the upgrading or renewal shall comply with this TSI and shall be subject to the procedure established in Article 15 of Directive (EU) 2016/797, unless a permission for non-application of TSI is granted according to Article 7 of Directive (EU) 2016/797.

(c) Where a new authorisation for placing in service is required, the Contracting Entity shall define the practical measures and different phases of the project, which are necessary to achieve the required levels of performance. These project phases may include transition periods for placing equipment into service with reduced levels of performance.

(d) Where a new authorisation for placing in service is not required, compliance with this TSI is recommended. Where compliance is not possible, the contracting entity shall inform the Member State of the reasons thereof.:'

(12) point (2) in Section 7.3.2 is deleted;

(13) a new section 7.3.5 is added:

#### '7.3.5. *Route compatibility checks before the use of authorised vehicles*

The procedure to be applied and the parameters of the energy subsystem to be used by the railway undertaking, for the purpose of route compatibility check are described in point 4.2.2.5 and appendix D1 of the Annex to Commission Implementing Regulation (EU) 2019/773 (\*).

(\*) Commission Implementing Regulation (EU) 2019/773 of 16 May 2019 on the technical specification for interoperability relating to the operation and traffic management subsystem of the rail system within the European Union and repealing Decision 2012/757/EU (OJ L 139 I, 27.5.2019, p. 5).:'

(14) section 7.4.1 is replaced by the following:

‘7.4.1. *General*

- (1) The specific cases, as listed in point 7.4.2, describe special provisions that are needed and authorised on particular networks of each Member State.
- (2) These specific cases are classified as:
  - “P” cases: “permanent” cases,
  - “T” cases: “temporary” cases, where the target system shall be reached by 31 December 2035.

All specific cases and their relevant dates shall be re-examined in the course of future revisions of the TSI with a view to limiting their technical and geographical scope based on an assessment of their impact on safety, interoperability, cross border services, TEN-T corridors, and the practical and economic impacts of retaining or eliminating them. Special account shall be given to availability of EU funding.

Specific cases shall be limited to the route or network where they are strictly necessary and taken account of through route compatibility procedures.’

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## ANNEX IV

The Annex to Regulation (EU) No 1302/2014 is amended as follows:

(1) section 1.1 is amended as follows:

- (a) the reference to 'Article 1 of Directive 2008/57/EC' is replaced by the reference to 'Article 1 of Directive (EU) 2016/797';
- (b) the reference to 'Annex II section 2.7 of Directive 2008/57/EC' is replaced by the reference to 'section 2.7 of Annex II to Directive (EU) 2016/797';
- (c) the text 'Annex I sections 1.2 and 2.2 of Directive 2008/57/EC' is replaced by the text 'section 2 of Annex I to Directive (EU) 2016/797';
- (d) the text 'Article 1(3) of Directive 2008/57/EC' is replaced by the text 'Articles 1(3) and (4) of Directive (EU) 2016/797';

(2) sections 1.2 to 1.3 are replaced by the following:

**1.2. Geographical Scope**

The geographical scope of this TSI is the Union rail system as set out in Annex I to Directive (EU) 2016/797 and excludes the cases referred to in Articles 1(3) and (4) of Directive (EU) 2016/797.;

**1.3. Content of this TSI**

In accordance with Article 4(3) of Directive (EU) 2016/797, this TSI:

- (a) indicates its intended scope (Chapter 2);
- (b) lays down essential requirements for the subsystem rolling stock "Locomotives and passenger rolling stock" and its interfaces vis-à-vis other subsystems (Chapter 3);
- (c) establishes the functional and technical specifications to be met by the subsystem and its interfaces vis-à-vis other subsystems (Chapter 4);
- (d) determines the interoperability constituents and interfaces which must be covered by European specifications, including European standards, which are necessary to achieve interoperability within the European Union's rail system (Chapter 5);
- (e) states, in each case under consideration, which procedures are to be used in order to assess the conformity or the suitability for use of the interoperability constituents, on the one hand, or the "EC" verification of the subsystems, on the other hand (Chapter 6);
- (f) indicates the strategy for implementing this TSI (Chapter 7);
- (g) indicates for the staff concerned, the professional qualifications and health and safety conditions at work required for the operation and maintenance of the subsystem, as well as for the implementation of this TSI (Chapter 4);
- (h) indicates the provisions applicable to the existing "rolling stock" subsystem, in particular in the event of upgrading and renewal and, in such cases, the modification work which requires an application for a new authorisation;
- (i) indicates the parameters of "rolling stock" subsystem to be checked by the railway undertaking and the procedures to be applied to check those parameters after the delivery of the vehicle authorisation for placing on the market and before the first use of the vehicle to ensure compatibility between vehicles and the routes on which they are to be operated.

In accordance with Article 4(5) of the Directive (EU) 2016/797, provisions for specific cases are indicated in Chapter 7.;

- (3) in section 2.1, the reference to 'Directive 2008/57/EC' is replaced by the reference to 'Directive (EU) 2016/797';
- (4) in section 2.2, the text 'Directive 2008/57/EC, Article 2(c)' is replaced by the text 'point (3) of Article 2 of Directive (EU) 2016/797';
- (5) in section 2.2.2, the text is replaced by the following:

#### '2.2.2. Rolling stock

Definitions below are classified in three groups as defined in the section 2 of Annex I to Directive (EU) 2016/797:

- (A) Locomotives and passenger rolling stock, including thermal or electric traction units, self-propelling thermal or electric passenger trains, and passenger coaches:

(1) Thermal or electric traction units

A Locomotive is a traction vehicle (or combination of several vehicles) that is not intended to carry a payload and has the ability to be uncoupled in normal operation from a train and to operate independently.

A Shunter is a traction unit designed for use only on shunting yards, stations and depots.

Traction in a train can also be provided by a powered vehicle with or without driving cab, which is not intended to be uncoupled during normal operation. Such a vehicle is called a Power Unit (or power car) in general or a Power Head when located at one end of the trainset and fitted with a driving cab.

(2) Self-propelling thermal or electric passenger trains

A Trainset is a fixed formation that can operate as a train; it is by definition not intended to be reconfigured, except within a workshop environment. It is composed of only motored or of motored and non-motored vehicles.

An Electric and/or Diesel Multiple Unit is a trainset in which all vehicles are capable of carrying a payload (passengers or luggage/mail or freight).

A Railcar is a vehicle that can operate autonomously and is capable of carrying a payload (passengers or luggage/mail or freight).

A tram – train is a vehicle designed for combined use on both a light-rail infrastructure and a heavy-rail infrastructure;

(3) Passenger coaches and other related cars

A Coach is a vehicle without traction in a fixed or variable formation capable of carrying passengers (by extension, requirements specified to apply to coaches in this TSI are deemed to apply also to restaurant cars, sleeping cars, couchettes cars, etc.).

A Van is a vehicle without traction capable of carrying payload other than passengers, e.g. luggage or mail, intended to be integrated into a fixed or variable formation which is intended to transport passengers.

A Driving Trailer is a vehicle without traction equipped with a driving cab.

A coach may be equipped with a driver's cab; such a coach is then named a Driving Coach.

A van may be fitted with a driver's cab and as such is known as a Driving Van.

A Car carrier is a vehicle without traction capable of carrying passenger motor cars without their passengers and which is intended to be integrated in a passenger train.

A Fixed Rake of Coaches is a formation of several coaches “semi-permanently” coupled together, or which can be reconfigured only when it is out of service.

- (B) Freight wagons, including low-deck vehicles designed for the entire network and vehicles designed to carry lorries

These vehicles are out of the scope of this TSI. They are covered by Regulation (EU) No 321/2013 (the “freight wagons” TSI).

- (C) Special vehicles, such as on-track machines.

On track Machines (OTMs) are vehicles specially designed for construction and maintenance of the track and infrastructure. OTMs are used in different modes: working mode, transport mode as self-propelling vehicle, transport mode as a hauled vehicle.

Infrastructure inspection vehicles are utilised to monitor the condition of the infrastructure. They are operated in the same way as freight or passenger trains, with no distinction between transport and working modes.;

- (6) section 2.3.1 is replaced by the following:

*‘2.3.1 Types of rolling stock*

The scope of this TSI concerning rolling stock, classified in three groups as defined in the Annex I section 2 of Directive (EU) 2016/797, is detailed as follows:

- (A) Locomotives and passenger rolling stock, including thermal or electric traction units, self-propelling thermal or electric passenger trains, and passenger coaches

- (1) Thermal or electric traction units

This type includes traction vehicles that are not capable of carrying a payload, such as thermal or electric locomotives or power units.

The concerned traction vehicles are intended for freight or/and passenger transport.

Exclusion from the scope:

Shunters (as defined in Section 2.2) are not in the scope of this TSI. When they are intended to operate on the Union railway network (movement between shunting yards, stations and depots), article 1.4(b) of Directive (EU) 2016/797 applies.

- (2) Self-propelling thermal or electric passenger trains

This type includes any train in fixed or pre-defined formation, composed of vehicles passenger carrying and/or vehicles not carrying passengers.

Thermal or electric traction equipment is installed in some vehicles of the train, and the train is fitted with a driver’s cab.

Exclusion from the scope:

In accordance with Articles 1.3, 1.4(d) and 1.5 of Directive (EU) 2016/797, the following rolling stock is excluded from the scope of the TSI:

- Rolling stock intended to operate on local, urban or suburban networks functionally separate from the rest of the railway system.

- Rolling stock primarily used on light rail infrastructure but equipped with some heavy rail components necessary to enable transit to be effected on a confined and limited section of heavy rail infrastructure for connectivity purposes only.
- Tram – trains.

(3) Passenger coaches and other related cars

Passenger carriages:

This type includes vehicles without traction carrying passengers (coaches, as defined in Section 2.2), and operated in a variable formation with vehicles from the category “thermal or electric traction units” defined above to provide the traction function.

Non-passenger carrying vehicles included in a passenger train:

This type includes vehicles without traction included in passenger trains (e.g. luggage or postal vans, car carriers, vehicles for service...); they are in the scope of this TSI, as vehicles related to transport of passengers.

(B) Freight wagons, including low-deck vehicles designed for the entire network and vehicles designed to carry lorries

Freight wagons are not in the scope of this TSI; they are covered by the “freight wagons” TSI even when they are included in a passenger train (the train composition is in this case an operational issue).

Vehicles intended to carry road motor vehicles (with persons on-board these road motor vehicles) are not in the scope of this TSI.

(C) Special vehicles, such as on-track machines

This type of rolling stock is in the scope of the TSI only when:

- (1) It is running on its own rail wheels; and
- (2) It is designed and intended to be detected by a track based train detection system for traffic management; and
- (3) In case of OTMs, it is in transport (running) configuration, self-propelled or hauled.

Exclusion from the scope of this TSI:

In case of OTMs, working configuration is outside the scope of this TSI.;

(7) in chapter 3, the references to ‘Annex III to Directive 2008/57/EC’ are replaced by the reference to ‘Annex III to Directive (EU) 2016/797’;

(8) section 3.1 is replaced as follows:

**‘3.1 Elements of the rolling stock subsystem corresponding to the essential requirements**

The following table indicates the essential requirements, as set out and numbered in Annex III of Directive (EU) 2016/797, taken into account by the specifications set out in Chapter 4 of this TSI.

*Rolling stock elements corresponding to essential requirements*

*Note: only points in section 4.2 which contain requirements are listed.*

Ref. Point	Element of the rolling stock sub-system	Safety	Reliability-Availability	Health	Environmental protection	Technical compatibility
4.2.2.2.2	Inner coupling	1.1.3 2.4.1				
4.2.2.2.3	End coupling	1.1.3 2.4.1				
4.2.2.2.4	Rescue coupling		2.4.2			2.5.3
4.2.2.2.5	Staff access for coupling and uncoupling	1.1.5		2.5.1		2.5.3
4.2.2.3	Gangways	1.1.5				
4.2.2.4	Strength of vehicle structure	1.1.3 2.4.1				
4.2.2.5	Passive safety	2.4.1				
4.2.2.6	Lifting and jacking					2.5.3
4.2.2.7	Fixing of devices to carbody structure	1.1.3				
4.2.2.8	Staff and freight access doors	1.1.5 2.4.1				
4.2.2.9	Mechanical characteristics of glass	2.4.1				
4.2.2.10	Load conditions and weighted mass	1.1.3				
4.2.3.1	Gauging					2.4.3
4.2.3.2.1	Axle load parameter					2.4.3
4.2.3.2.2	Wheel load	1.1.3				
4.2.3.3.1	Rolling stock characteristics for compatibility with train detection systems	1.1.1				2.4.3 2.3.2
4.2.3.3.2	Axle bearing condition monitoring	1.1.1	1.2			
4.2.3.4.1	Safety against derailment running on twisted track	1.1.1 1.1.2				2.4.3
4.2.3.4.2	Running dynamic behaviour	1.1.1 1.1.2				2.4.3
4.2.3.4.2.1	Limit values for running safety	1.1.1 1.1.2				2.4.3
4.2.3.4.2.2	Track loading limit values					2.4.3

Ref. Point	Element of the rolling stock sub-system	Safety	Reliability-Availability	Health	Environmental protection	Technical compatibility
4.2.3.4.3	Equivalent conicity	1.1.1 1.1.2				2.4.3
4.2.3.4.3.1	Design values for new wheel profiles	1.1.1 1.1.2				2.4.3
4.2.3.4.3.2	In-service values of wheelset equivalent conicity	1.1.2	1.2			2.4.3
4.2.3.5.1	Structural design of bogie frame	1.1.1 1.1.2				
4.2.3.5.2.1	Mechanical and geometrical characteristics of wheelsets	1.1.1 1.1.2				2.4.3
4.2.3.5.2.2	Mechanical and geometrical characteristics of wheels	1.1.1 1.1.2				
4.2.3.5.3	Automatic variable gauge systems	1.1.1 1.1.2, 1.1.3	1.2			1.5
4.2.3.6	Minimum curve radius	1.1.1 1.1.2				2.4.3
4.2.3.7	Life guards	1.1.1				
4.2.4.2.1	Braking — Functional requirements	1.1.1 2.4.1	2.4.2			1.5
4.2.4.2.2	Braking — Safety requirements	1.1.1	1.2 2.4.2			
4.2.4.3	Type of brake system					2.4.3
4.2.4.4.1	Emergency braking command	2.4.1				2.4.3
4.2.4.4.2	Service braking command					2.4.3
4.2.4.4.3	Direct braking command					2.4.3
4.2.4.4.4	Dynamic braking command	1.1.3				
4.2.4.4.5	Parking braking command					2.4.3
4.2.4.5.1	Braking performance -General requirements	1.1.1 2.4.1	2.4.2			1.5
4.2.4.5.2	Emergency braking	1.1.2 2.4.1				2.4.3



Ref. Point	Element of the rolling stock sub-system	Safety	Reliability-Availability	Health	Environmental protection	Technical compatibility
4.2.4.5.3	Service braking					2.4.3
4.2.4.5.4	Calculations related to thermal capacity	2.4.1				2.4.3
4.2.4.5.5	Parking brake	2.4.1				2.4.3
4.2.4.6.1	Limit of wheel rail adhesion profile	2.4.1	1.2 2.4.2			
4.2.4.6.2	Wheel slide protection system	2.4.1	1.2 2.4.2			
4.2.4.7	Dynamic brake — Braking systems linked to traction system	2.4.1	1.2 2.4.2			
4.2.4.8.1.	Braking system independent of adhesion conditions – General	2.4.1	1.2 2.4.2			
4.2.4.8.2.	Magnetic track brake					2.4.3
4.2.4.8.3	Eddy current track brake					2.4.3
4.2.4.9	Brake state and fault indication	1.1.1	1.2 2.4.2			
4.2.4.10	Brake requirements for rescue purposes		2.4.2			
4.2.5.1	Sanitary systems				1.4.1	
4.2.5.2	Audible communication system	2.4.1				
4.2.5.3	Passenger alarm	2.4.1				
4.2.5.4	Communication devices for passengers	2.4.1				
4.2.5.5	Exterior doors: access to and egress from Rolling stock	2.4.1				
4.2.5.6	Exterior doors: system construction	1.1.3 2.4.1				
4.2.5.7	inter-unit doors	1.1.5				
4.2.5.8	Internal air quality			1.3.2		
4.2.5.9	body side windows	1.1.5				

Ref. Point	Element of the rolling stock sub-system	Safety	Reliability-Availability	Health	Environmental protection	Technical compatibility
4.2.6.1	Environmental conditions		2.4.2			
4.2.6.2.1	Slipstream effects on passengers on platform and on workers at track side	1.1.1		1.3.1		
4.2.6.2.2	Head pressure pulse					2.4.3
4.2.6.2.3	Maximum pressure variations in tunnels					2.4.3
4.2.6.2.4	Cross wind	1.1.1				
4.2.6.2.5	Aerodynamic effect on ballasted track	1.1.1				2.4.3
4.2.7.1.1	Head lights					2.4.3
4.2.7.1.2	Marker lights	1.1.1				2.4.3
4.2.7.1.3	Tail lights	1.1.1				2.4.3
4.2.7.1.4	Lamp controls					2.4.3
4.2.7.2.1	Horn – General	1.1.1				2.4.3 2.6.3
4.2.7.2.2	Warning horn sound pressure levels	1.1.1		1.3.1		
4.2.7.2.3	Protection					2.4.3
4.2.7.2.4	Horn control	1.1.1				2.4.3
4.2.8.1	Traction performance					2.4.3 2.6.3
4.2.8.2 4.2.8.2.1 to 4.2.8.2.9	Power supply					1.5 2.4.3 2.2.3
4.2.8.2.10	Electrical protection of the train	2.4.1				
4.2.8.3	Diesel and other thermal traction system	2.4.1				1.4.1
4.2.8.4	Protection against electrical hazards	2.4.1				
4.2.9.1.1	Driver's cab – General	—	—	—	—	—
4.2.9.1.2	Access and egress	1.1.5				2.4.3
4.2.9.1.3	External visibility	1.1.1				2.4.3

Ref. Point	Element of the rolling stock sub-system	Safety	Reliability-Availability	Health	Environmental protection	Technical compatibility
4.2.9.1.4	Interior layout	1.1.5				
4.2.9.1.5	Driver's seat			1.3.1		
4.2.9.1.6	Driver's desk- Ergonomics	1.1.5		1.3.1		
4.2.9.1.7	Climate control and air quality			1.3.1		
4.2.9.1.8	Internal lighting					2.6.3
4.2.9.2.1	Windscreen — Mechanical characteristics	2.4.1				
4.2.9.2.2	Windscreen — Optical characteristics					2.4.3
4.2.9.2.3	Windscreen – Equipment					2.4.3
4.2.9.3.1	Driver's activity control function	1.1.1				2.6.3
4.2.9.3.2	Speed indication	1.1.5				
4.2.9.3.3	Driver display unit and screens	1.1.5				
4.2.9.3.4	Controls and indicators	1.1.5				
4.2.9.3.5	Labelling					2.6.3
4.2.9.3.6	Radio remote control function by staff for shunting operation	1.1.1				
4.2.9.4	Onboard tools and portable equipment	2.4.1				2.4.3 2.6.3
4.2.9.5	Storage facility for staff personal effects	—	—	—	—	—
4.2.9.6	Recording device					2.4.4
4.2.10.2	Fire safety – Measures to prevent fire	1.1.4		1.3.2	1.4.2	
4.2.10.3	Measures to detect/control fire	1.1.4				
4.2.10.4	Requirements related to emergency situations	2.4.1				
4.2.10.5	Requirements related to evacuation	2.4.1				
4.2.11.2	Train exterior cleaning					1.5
4.2.11.3	Connection to toilet discharge system					1.5

Ref. Point	Element of the rolling stock sub-system	Safety	Reliability-Availability	Health	Environmental protection	Technical compatibility
4.2.11.4	Water refilling equipment			1.3.1		
4.2.11.5	Interface for water refilling					1.5
4.2.11.6	Special requirements for stabling of trains					1.5
4.2.11.7	Refuelling equipment					1.5
4.2.11.8	Train interior cleaning – power supply					2.5.3
4.2.12.2	General documentation					1.5
4.2.12.3	Documentation related to maintenance	1.1.1				2.5.1 2.5.2 2.6.1 2.6.2
4.2.12.4	Operating documentation	1.1.1				2.4.2 2.6.1 2.6.2
4.2.12.5	Lifting diagram and instructions					2.5.3
4.2.12.6	Rescue related descriptions		2.4.2			2.5.3'

(9) in section 4.1, the text 'Directive 2008/57/EC' is replaced by the text 'Directive (EU) 2016/797';

(10) in section 4.2.1.1, the text 'Article 5(8) of Directive 2008/57/EC' is replaced by the text 'Article 4(8) of Directive (EU) 2016/797';

(11) section 4.2.1.2 is amended as follows:

(a) the text 'Article 5(6) of Directive 2008/57/EC' is replaced by the text 'Article 4(6) of Directive (EU) 2016/797';

(b) the text 'Articles 5(6) and 17(3) of Directive 2008/57/EC' is replaced by the text 'Articles 4(6) and 13(2) of Directive (EU) 2016/797';

(12) point (b-2) of section 4.2.2.3 is replaced as follows:

'(b-2) Compatibility between units

On units equipped with manual coupling system of UIC type (as described in clause 5.3.2) and pneumatic brake system compatible with UIC type (as described in clause 4.2.4.3), the following requirements apply:

(1) The buffers and the screw coupling shall be installed according to clauses 5 and 6 of the specification referenced in Appendix J-1, index 110.

(2) The dimensions and layout of brake pipes and hoses, couplings and cocks shall meet the requirements set out in clauses 7 and 8 of the specification referenced in Appendix J-1, index 110.;

(13) points (5) to (9) of section 4.2.2.5 are replaced by the following:

‘(5) Passive safety is aimed at complementing active safety when all other measures have failed. For this purpose, the mechanical structure of vehicles shall provide protection of the occupants in the event of a collision by providing means of:

- limiting deceleration
- maintaining survival space and structural integrity of the occupied areas
- reducing the risk of overriding
- reducing the risk of derailment
- limiting the consequences of hitting a track obstruction.

To meet these functional requirements, units shall comply with the detailed requirements specified in the specification referenced in Appendix J-1, index 8 related to crashworthiness design category C-I (as per the specification referenced in Appendix J-1, index 8, Table 1 section 5), unless specified otherwise below.

The following four reference collision scenarios shall be considered:

- scenario 1: A front end impact between two identical units,
- scenario 2: A front end impact with a freight wagon,
- scenario 3: An impact of the unit with a large road vehicle on a level crossing,
- scenario 4: An impact of the unit into a low obstacle (e.g. car on a level crossing, animal, rock, etc.).

(6) These scenarios are described in the specification referenced in Appendix J-1, index 8, Table 3 of Section 5.

(7) The present TSI specifies crashworthiness requirements applicable within its scope; therefore, the Annex A of the specification referenced in Appendix J-1, index 8 shall not apply. The requirements of the specification referenced in Appendix J-1, index 8 Section 6 shall be applied in relation to the above given reference collision scenarios.

(8) To limit the consequences of hitting a track obstruction, the leading ends of locomotives, power heads, driving coaches and trainsets shall be equipped with an obstacle deflector. The requirements with which obstacle deflectors shall comply are defined in the specification referenced in Appendix J-1, index 8, Section 6.5.;

(14) in point (1) of section 4.2.2.10, the reference to ‘clause 2.1’ is replaced by ‘clause 4.5’;

(15) a new point (2a) is added below point (2) of section 4.2.3.3.2.2 as follows:

‘(2a) For units designed to be operated on the 1 668 mm system, the zone visible to the trackside equipment on rolling stock shall be the area as defines in Table 1 referring to the parameters of the specification referenced in Appendix J-1, index 15.

Table 1

**Target and prohibitive zone for units intended to be operated on 1 668 mm networks**

Track gauge [mm]	YTA [mm]	WTA [mm]	LTA [mm]	YPZ [mm]	WPZ [mm]	LPZ [mm]
1 668	1 176 ± 10	≥ 55	≥ 100	1 176 ± 10	≥ 110	≥ 500'

(16) point (2) of section 4.2.3.3.2.2 is replaced by the following:

‘(2) For units designed to be operated on other track gauges than 1 435 mm or 1 668 mm a specific case is declared where relevant (harmonised rule available for the concerned network).’;

(17) point (3) of section 4.2.3.4.2 is replaced by the following:

‘(3) The unit shall run safely and produce an acceptable level of track loading when operated within the limits defined by the combination(s) of speed and cant deficiency under the conditions set out in the specification referenced in Appendix J-1, index 16.

This shall be assessed by verifying that limit values specified below in clauses 4.2.3.4.2.1 and 4.2.3.4.2.2 of this TSI are respected; the conformity assessment procedure is described in clause 6.2.3.4 of this TSI.’;

(18) point (5) of section 4.2.3.4.2 is replaced by the following:

‘(5) The running dynamic behaviour test report (including limits of use and track loading parameters) shall be stated in the technical documentation described in clause 4.2.12 of this TSI.

Track loading parameters (including the additional ones  $Y_{max}$ ,  $B_{max}$  and the  $B_{qst}$  where relevant) to be recorded are defined in the specification referenced in Appendix J-1, index 16.’;

(19) point (1) of section 4.2.3.4.2.1 is replaced by the following:

‘(1) The limit values for running safety which the unit shall meet are specified in the specification referenced in Appendix J-1, index 17.’;

(20) point (1) of section 4.2.3.4.2.2 is replaced by the following:

‘(1) The limit values for track loading which the unit shall meet (when assessing with the normal method) are specified in the specification referenced in Appendix J-1, index 19.’;

(21) section 4.2.3.5.2.3 is deleted;

(22) section 4.2.3.5.3 is added after section 4.2.3.5.2.2 as follows:

‘4.2.3.5.3. *Automatic variable gauge systems*

- (1) This requirement is applicable to units equipped with an automatic variable gauge system with changeover mechanism of the axial position of the wheels allowing the unit to be compatible with 1 435 mm track gauge and other track gauge(s) within the scope of this TSI by means of passage through a track gauge changeover facility.
- (2) The changeover mechanism shall ensure the locking in the correct intended axial position of the wheel.
- (3) After passage through the track gauge changeover facility, the verification of the state of the locking system (locked or unlocked) and of the position of the wheels shall be performed by one or more of the following means: visual control, on-board control system or infrastructure/facility control system. In case of on-board control system, a continuous monitoring shall be possible.
- (4) If a running gear is equipped with brake equipment subject to a change in position during the gauge change operation, the automatic variable gauge system shall ensure the position and safe locking in the correct position of this equipment simultaneously to those of the wheels.
- (5) The failure of the locking of the position of the wheels and braking equipment (if relevant) during operation has typical credible potential to lead directly to a catastrophic accident (resulting in multiple fatalities); considering this severity of the failure consequence, it shall be demonstrated that the risk is controlled to an acceptable level.

- (6) The automatic variable gauge system is defined as an interoperable constituent (clause 5.3.4b). The conformity assessment procedure is specified in clause 6.1.3.1a (IC level), in clause 6.2.3.5 (safety requirement) and in clause 6.2.3.7b (subsystem level) of this TSI.
- (7) The track gauges the unit is compatible with shall be recorded in the technical documentation. A description of the changeover operation in normal mode, including the type(s) of track gauge changeover facility(ies) the unit is compatible with, shall be part of the technical documentation (see also clause 4.2.12.4 (1) of this TSI).
- (8) The requirements and conformity assessments required in other sections of this TSI apply independently for each wheel position corresponding to one track gauge, and have to be documented accordingly.;

(23) section 4.2.4.8.2 is replaced by the following:

*4.2.4.8.2. Magnetic track brake*

- (1) Requirements on magnetic brakes specified for compatibility with train detection system based on axle counters are referenced in point 4.2.3.3.1.2(10) of this TSI.
- (2) A magnetic track brake is allowed to be used as an emergency brake, as mentioned in the TSI INF, clause 4.2.6.2.2.
- (3) The geometrical characteristics of the end elements of the magnet in contact with the rail shall be as specified for one of the types described in the specification referenced in Appendix J-1, index 31.
- (4) Magnetic track brake shall not be used at speed higher than 280 km/h.
- (5) The braking performance of the unit specified in clauses 4.2.4.5.2 of this TSI shall be determined with and without the use of magnetic track brakes.;

(24) section 4.2.4.8.3 is replaced by the following:

*4.2.4.8.3. Eddy current track brake*

- (1) This clause covers only eddy current track brake developing a brake force between the unit and the rail.
- (2) Requirements on eddy current track brakes specified for compatibility with train detection system based on axle counters, track circuits, wheel detectors and vehicle detectors based on inductive loops are referenced in point 4.2.3.3.1.2(10) of this TSI.
- (3) If the eddy current track brake requires a displacement of its magnets when the brake is applied, the unobstructed movement of such magnets between the “brake released” and “brake applied” positions shall be demonstrated by calculation in accordance with the specification referenced in Appendix J-1, index 14.
- (4) The maximum distance between the eddy current track brake and the track corresponding to “brake released” position will be recorded in the technical documentation described in clause 4.2.12 of this TSI.
- (5) The eddy current track brake shall not operate below a fixed speed threshold.
- (6) The conditions for use of eddy current track brake for technical compatibility with the track are not harmonised (regarding in particular their effect on rail heating and vertical force) and are an open point.
- (7) The Register of Infrastructure indicates per track section if their use is allowed, and provides in such case their conditions for use.
  - The maximum distance between the eddy current track brake and the track corresponding to “brake released” referred to in point (4),
  - Fixed speed threshold referred to in point (5),

- Vertical force as a function of the train speed, for the case of full application of eddy current track brake (emergency braking) and limited application of eddy current brake (service braking),
  - Braking force as a function of the train speed, for the case of full application of eddy current track brake (emergency braking) and limited application of eddy current brake (service braking).
- (8) The braking performance of the unit specified in clauses 4.2.4.5.2 and 4.2.4.5.3 of this TSI shall be determined with and without the use of eddy current track brakes.;

(25) point (1) of section 4.2.6.2 is replaced by the following:

- (1) The requirements in this clause apply to all rolling stock. For rolling stock operated on the 1 520 mm and 1 600 mm track gauge systems, in case of a maximum speed higher than the limits specified in the clauses 4.2.6.2.1 to 4.2.6.2.5, the procedure for innovative solution shall apply.;

(26) section 4.2.6.2.1 is replaced by the following:

*4.2.6.2.1. Slipstream effects on passengers on platform and on workers trackside*

- (1) Units of maximum design speed  $v_{tr,max} > 160$  km/h, running in the open air at a reference speed  $v_{tr,ref}$  shall not cause the air speed to exceed, at each measurement point defined in clause 4.2.2.1 and Table 5 of the specification referenced in Appendix J-1 index 108, the value  $u_{95\%,max}$  as indicated in Table 5 of the specification referenced in Appendix J-1, index 108.
- (2) For units intended to be operated on the networks with track gauges of 1 524 mm and 1 668 mm, the corresponding values in Table 4 referring to the parameters of the specification referenced in Appendix J-1, index 108 shall be applied:

Table 4

**Limit criteria**

Track gauge (mm)	Maximum design speed $v_{tr,max}$ (km/h)	Measurement point		Trackside maximum permissible air speed, (limit values for $u_{95\%,max}$ (m/s))	Reference speed $v_{tr,ref}$ (km/h)
		Measurement performed at height above the top of rail	Measurement performed at a distance from the track centre		
1 524	$160 < v_{tr,max} < 250$	0,2 m	3,0 m	22,5	Maximum design speed
		1,4 m	3,0 m	18	200 km/h or the maximum design speed, whichever is lower
1 668	$160 < v_{tr,max} < 250$	0,2 m	3,1 m	20	Maximum design speed
		1,4 m	3,1 m	15,5	200 km/h or the maximum design speed, whichever is lower
	$250 \leq v_{tr,max}$	0,2 m	3,1 m	22	300 km/h or the maximum design speed, whichever is lower
		1,4 m	3,1 m	15,5	200 km/h



- (3) The train formation to be tested is specified for fixed/predefined formations and units assessed for use in general operation respectively in clauses 4.2.2.2 and 4.2.2.4 of the specification referenced in Appendix J-1, index 108. Single units fitted with a drivers cab shall be tested within a formation complying with the requirements set out in clause 4.2.2.3 of specification referenced in Appendix J-1, index 108.
- (4) The conformity assessment procedure is described in clause 6.2.3.13 of this TSI;

(27) section 4.2.6.2.2 is amended as follows:

(a) point (1) is replaced by the following:

‘(1) The passing of two trains generates an aerodynamic load on each of the two trains. The requirement on head pressure pulse in open air allows a limit aerodynamic load induced by the rolling stock in open air to be defined assuming a distance between track centres for the track where the train is intended to be operated.

The distance between track centres depends on the speed and the gauge of the line. Minimum values of a distance between track centres depending on speed and gauge are defined in the INF TSI.’;

(b) point (2) is replaced by the following:

‘(2) Units with a maximum design speed higher than 160 km/h running in the open air at their reference speed  $v_{tr,ref}$  on 1 435 mm track gauge shall not cause the maximum peak-to-peak pressure to exceed the maximum permissible pressure change defined in Table 2 of the specification referenced in Appendix J-1, index 109 assessed over the measurement positions defined in point 4.1.2 of the specification referenced in Appendix J-1, index 109.’;

(c) point (3) is replaced by the following:

‘(3) For units intended to be operated on the networks with track gauges of 1 524 mm and 1 668 mm, the corresponding values in Table 4a referring to the parameters of the specification referenced in Appendix J-1, index 109 shall be applied:

Table 4a

**Limit criteria**

Track gauge	Maximum design speed $v_{tr,max}$ (km/h)	Measurement point		Permissible pressure change, $(\Delta P_{95\%,max})$	Reference speed $v_{tr,ref}$ (km/h)
		Measurement performed at height above the top of rail	Measurement performed at a distance from the track centre		
1 524 mm	$160 < v_{tr,max} < 250$	between 1,5 m and 3,0 m	2,5 m	1 600 Pa	Maximum design speed
1 668 mm	$160 < v_{tr,max} < 250$	between 1,5 m and 3,0 m	2,6 m	800 Pa	Maximum design speed
	$250 \leq v_{tr,max}$	between 1,5 m and 3,0 m	2,6 m	800 Pa	250 km/h’

(28) section 4.2.6.2.5 is replaced by the following:

‘4.2.6.2.5 Aerodynamic effect on ballasted tracks

- (1) This requirement applies to units of maximum design speed higher than 250 km/h.
- (2) The requirement on the aerodynamic effect of trains on ballasted tracks, in order to limit risks induced by the projection of ballast (ballast pick up), is an open point.’;

(29) point (2) of section 4.2.7.1 is replaced by the following:

‘(2) This requirement is not applicable to lights with luminous intensity not higher than 100 cd that are included in push buttons for the command of passenger doors (not continuously lit).’;

(30) a new point (5) is added below point (4) of section 4.2.8.2.9.1.1 as follows:

‘(5) 3 920 mm and 5 700 mm above rail level for electric units designed to be operated on the 1 500 V DC system in accordance with the IRL gauge (track gauge system 1 600 mm).’;

(31) point (1) of section 4.2.8.2.9.2 is replaced by the following:

‘(1) For electric units designed to be operated on other track gauge systems than 1 520 mm or 1 600 mm system, at least one of the pantograph(s) to be installed shall have a head geometry type compliant with one of the two specifications given in the clauses 4.2.8.2.9.2.1 and 2 below.’;

(32) a new point (2a) is added below point (2) of section 4.2.8.2.9.2 as follows:

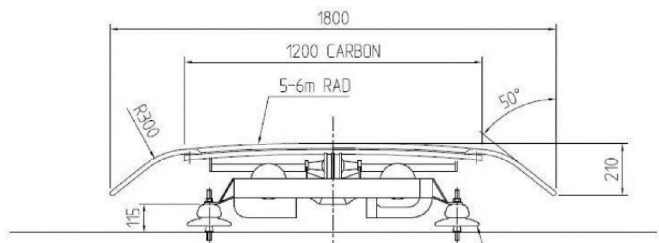
‘(2a) For electric units designed to be operated solely on the 1 600 mm system, at least one of the pantographs to be installed shall have a head geometry type compliant with the specifications given in the clauses 4.2.8.2.9.2.3a below.’;

(33) section 4.2.8.2.9.3 is re-numbered 4.2.8.2.9.3a;

(34) section 4.2.8.2.9.3 is added after section 4.2.8.2.9.2.3 as follows:

‘4.2.8.2.9.3 Pantograph head geometry type 1 800 mm

(1) The profile of the pantograph head shall be as depicted below:



(35) point (4) of section 4.2.11.6 is replaced by the following:

‘(4) “Single pole” power supply line (AC 1 kV, AC/DC 1,5 kV, DC 3 kV), in accordance with the specification referenced in Appendix J-1, index 111.’;

(36) in section 4.2.12.1, the reference to ‘clause 2.4 of Annex VI of Directive 2008/57/EC’ is replaced by the reference to ‘clause 2.4(a) of Annex IV of Directive (EU) 2016/797’;

(37) in section 4.2.12.1, points (2) and (3) are replaced by:

‘(2) This documentation, being part of the technical file, is compiled by the applicant and has to accompany the EC declaration of verification. It is kept by the applicant throughout the service life of the subsystem.’;

(38) a new point (3) is added below point (2) of section 4.2.12.1 as follows:

‘(3) The applicant or any entity authorised by the applicant (e.g. a keeper) shall provide the part of this documentation required to manage the maintenance documentation as defined in the art 14(3)(b) of Directive (EU) 2016/798 of the European Parliament and of the Council (\*) to the entity in charge of maintenance as soon as it is assigned for the maintenance of the unit.

(\*) Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety (OJ L 138, 26.5.2016, p. 102).’;

(39) point (4) of section 4.2.12.1 is replaced by the following:

‘(4) The documentation also includes a list of safety critical components. Safety critical components are components for which a single failure has a credible potential to lead directly to a serious accident as defined in Article 3(12) of Directive (EU) 2016/798.

(5) The content of the documentation is described in the clauses below.;

(40) a new point (3a) is added below point (3) of section 4.2.12.2 as follows:

‘(3a) For units designed and assessed for general operation, this shall include a description of the electric interfaces between units and of communication protocols, with the reference to the standards or other normative documents that have been applied. Communication protocols (if used) shall comply with the specification referenced in Appendix J-1, index 112.’;

(41) a new point (9a) is added below point (9) of section 4.2.12.2 as follows:

‘(9a) Maximum distance between the eddy current track brake and the track corresponding to “brake released”, fixed speed threshold, vertical force and braking force as a function of the train speed, for the case of full application of eddy current track brake (emergency braking) and limited application of eddy current brake (service braking), as required in clause 4.2.4.8.3.’;

(42) point (2) of section 4.2.12.3 is replaced by the following:

‘(2) The maintenance design justification file: explains how maintenance activities are defined and designed in order to ensure that the rolling stock characteristics will be kept within acceptable limits of use during its lifetime.

The maintenance design justification file shall give input data in order to determine the criteria for inspection and the periodicity of maintenance activities.’;

(43) point (3) of section 4.2.12.3 is replaced by the following:

‘(3) The maintenance description file: explains how maintenance activities are recommended to be performed.’;

(44) a new point (1a) is added below point (1) of section 4.2.12.3.1 as follows:

‘(1a) Precedents, principles and methods used to identify the safety critical components and their specific operational, servicing, maintenance and traceability requirements.’;

(45) a new point (6a) is added below point (6) of section 4.2.12.3.2 as follows:

‘(6a) Safety critical components list: The safety critical components list shall contain the specific servicing, maintenance and servicing/maintenance traceability requirements.’;

(46) point (1) of section 4.2.12.4 is replaced by the following:

‘(1) A description of operation in normal mode, including the operational characteristics and limitations of the unit (e.g. vehicle gauge, maximum design speed, axle loads, brake performance, type(s) and operation of track gauge changeover facility(ies) the unit is compatible with...).’;

(47) a new point (3a) is added below point (3) of section 4.2.12.4 as follows:

‘(3a) Safety critical components list: The safety critical components list shall contain the specific operational and traceability requirements.’;

(48) Table 7 in section 4.3.2 is replaced by the following:

‘Table 7

**Interface with the Infrastructure subsystem**

Reference LOC & PAS TSI		Reference Infrastructure TSI	
Parameter	Point	Parameter	Point
Rolling stock kinematic gauge	4.2.3.1.	Structure gauge	4.2.3.1
		Distance between track centres	4.2.3.2
		Minimum radius of vertical curve	4.2.3.5
Axle load parameter	4.2.3.2.1	Track resistance to vertical loads	4.2.6.1
		Lateral track resistance	4.2.6.3
		Resistance of new bridges to traffic loads	4.2.7.1
		Equivalent vertical loading for new earthworks and earth pressure effects	4.2.7.2
		Resistance of existing bridges and earthworks to traffic loads	4.2.7.4
Running dynamic behaviour	4.2.3.4.2.	Cant deficiency	4.2.4.3
Running dynamic limit values for track loading	4.2.3.4.2.2	Track resistance to vertical loads	4.2.6.1
		Lateral track resistance	4.2.6.3
Equivalent conicity	4.2.3.4.3	Equivalent conicity	4.2.4.5
Geometrical characteristics of wheelset	4.2.3.5.2.1	Nominal track gauge	4.2.4.1
Geometrical characteristics of wheels	4.2.3.5.2.2	Rail head profile for plain line	4.2.4.6
Automatic variable gauge systems	4.2.3.5.3	In service geometry of switches and crossings	4.2.5.3
Minimum curve radius	4.2.3.6	Minimum radius of horizontal curve	4.2.3.4
Maximum average deceleration	4.2.4.5.1	Longitudinal track resistance	4.2.6.2
		Actions due to traction and braking	4.2.7.1.5
Slipstream effects	4.2.6.2.1	Resistance of new structures over or adjacent to tracks	4.2.7.3
Head pressure pulse	4.2.6.2.2	Maximum pressure variations in tunnels	4.2.10.1
Maximum pressure variations in tunnels	4.2.6.2.3	Distance between track centres	4.2.3.2

Reference LOC & PAS TSI		Reference Infrastructure TSI	
Parameter	Point	Parameter	Point
Crosswind	4.2.6.2.4	Effect of crosswinds	4.2.10.2
Aerodynamic effect on ballasted track	4.2.6.2.5	Ballast pick-up	4.2.10.3
Toilet discharge system	4.2.11.3	Toilet discharge	4.2.12.2
Exterior cleaning through a washing plant	4.2.11.2.2	Train external cleaning facilities	4.2.12.3
Water refilling equipment:	4.2.11.4	Water restocking	4.2.12.4
Interface for water refilling	4.2.11.5		
Refuelling equipment	4.2.11.7	Refuelling	4.2.12.5
Special requirements for stabling of trains	4.2.11.6	Electric shore supply	4.2.12.6'

(49) a new point (3a) is added below point (3) of section 4.4 as follows:

'(3a) For the safety critical components, the specific operational and operational traceability requirements are developed by the designers/manufacturers at design phase and through a collaboration between designers/manufacturers and the concerned railway undertakings after vehicles have entered into operation.';

(50) section 4.5 is replaced by the following:

#### '4.5. Maintenance rules

- (1) In light of the essential requirements mentioned in Section 3, the provisions for maintenance of the rolling stock in the scope of this TSI:
  - Clause 4.2.11 "Servicing"
  - Clause 4.2.12 "Documentation for Operation and Maintenance".
- (2) Other provisions in the section 4.2 (clauses 4.2.3.4 and 4.2.3.5) specify for particular characteristics the limit values that have to be verified during maintenance activities.
- (2a) The safety critical components and their specific servicing, maintenance and maintenance traceability requirements are identified by the designers/manufacturers at design phase and through a collaboration between designers/manufacturers and the concerned entities in charge of maintenance after vehicles have entered into operation.
- (3) From the information mentioned above and provided in the clause 4.2, the appropriate tolerances and intervals to ensure compliance with the essential requirements throughout the lifetime of the rolling stock are defined at maintenance operational level by and under the sole responsibility of entities in charge of maintenance (not in the scope of the assessment against this TSI); this activity includes:
  - The definition of the in-service values where they are not specified in this TSI, or where operating conditions allow the use of different in-service limit values than those specified in this TSI.
  - The justification of the in-service values, by providing the equivalent information to those required in clause 4.2.12.3.1 "The maintenance design justification file".
- (4) On the basis of the information mentioned above in this clause, a maintenance plan is defined at maintenance operational level by and under the sole responsibility of the entities in charge of maintenance (not in the scope of the assessment against this TSI), consisting in a structured set of maintenance tasks that include the activities, tests and procedures, means, maintenance criteria, periodicity, working time required to carry out the maintenance tasks.

- (5) For on-board software, the designer/manufacture shall specify, for any on-board software modification, all maintenance requirements and procedures (including health monitoring, diagnosis of events, test methods and tools and also the required professional competence) necessary for achieving essential requirements and values quoted in the mandatory requirements of this TSI throughout the life-cycle (Installation, normal operation, failures, repair work, checking and maintenance, decommissioning, etc.);

(51) in section 4.7, the reference to 'Directive 2008/57/EC' is replaced by the reference to 'Directive (EU) 2016/797';

(52) in section 4.8, the reference to 'Article 34(2a) of Directive 2008/57/EC' is replaced by the reference to 'point (a) of Article 48(3) of Directive (EU) 2016/797';

(53) a new section 4.9 is added below point (3) of section 4.8 as follows:

#### **'4.9. Route compatibility checks before the use of authorised vehicles**

The parameters of the subsystem "rolling stock — locomotives and passenger rolling stock" to be used by the railway undertaking, for the purpose of route compatibility check, are described in Appendix D1 of Commission Implementing Regulation (EU) 2019/773 (\*).

(\*) Commission Implementing Regulation (EU) 2019/773 of 16 May 2019 on the technical specification for interoperability relating to the operation and traffic management subsystem of the rail system within the European Union and repealing Decision 2012/757/EU (OJ L 139 I, 27.5.2019, p. 5).;

(54) in section 5.1, the reference to 'Article 2(f) of Directive 2008/57/EC' is replaced by the reference to 'Article 2(7) of Directive (EU) 2016/797';

(55) a new section 5.3.4a is added below section 5.3.4 as follows:

#### **'5.3.4a Automatic variable gauge systems**

- (1) An IC "automatic variable gauge system" shall be designed and assessed for an area of use defined by:

- The track gauges the system is designed for.
- The range of maximum static axle loads (corresponding to design mass under normal payload as defined in clause 4.2.2.10 of this TSI).
- The range of nominal wheel tread diameters.
- The maximum design speed of the unit.
- The type(s) of track gauge changeover facility(ies) the system is designed for, including the nominal speed through the track gauge changeover facility(ies) and the maximum axial forces during the automatic gauge changeover process.

- (2) An automatic variable gauge system shall comply with the requirements set out in clause 4.2.3.5.2.3; these requirements shall be assessed at IC level as set out in clause 6.1.3.1a.;

(56) in section 6.1.1, the text 'Article 13(1) and Annex IV of Directive 2008/57/EC' is replaced by the reference to 'Article 10 of Directive (EU) 2016/797';

(57) a new point (3) is added below point (2) of section 6.1.1 as follows:

(3) In case of a specific case applicable to a component defined as interoperability constituent in section 5.3 of this TSI, the corresponding requirement can be part of the verification at interoperability constituent level only in the case where the component remains compliant to the chapters 4 and 5 of this TSI, and where the specific case does not refer to a national rule (i.e. additional requirement compatible with the core TSI and fully specified in the TSI).

In other cases, the verification shall be made at subsystem level; when a national rule applies to a component, the concerned Member State may define relevant applicable conformity assessment procedures.;

(58) in the second table of section 6.1.2, a new row is added below the row '5.3.4 wheel' as follows:

'5.3.4a	Automatic variable gauge systems		X (*)		X	X	X (*)	X'
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(59) a new section 6.1.3.1a is added below point (8) of section 6.1.3.1 as follows:

'6.1.3.1a. Automatic variable gauge system (clause 5.3.4a)

- (1) The assessment procedure shall be based on a validation plan covering all aspects mentioned in clauses 4.2.3.5.3 and 5.3.4a.
- (2) The validation plan shall be consistent with the safety analysis required in clause 4.2.3.5.3 and shall define the assessment needed in all the following different phases:
  - Design review.
  - Static tests (bench tests and integration in the running gear/unit tests).
  - Test on track gauge changeover facility(ies), representative of in-service conditions.
  - On-track tests, representative of in-service conditions.
- (3) Regarding the demonstration of compliance to points (5) of clause 4.2.3.5.3, the assumptions considered for the safety analysis related to the vehicle the system is intended to be integrated in, and related to the mission profile of that vehicle, shall be clearly documented.
- (4) The automatic variable gauge system may be subject to an assessment of suitability for use (module CV; see also clause 6.1.6).
- (5) The certificate delivered by the Notified Body in charge of the conformity assessment shall include both the conditions for use as per clause 5.3.4a (1) and the type(s) and operating conditions of the track gauge changeover facility(ies) the automatic variable gauge system has been assessed for.;

(60) point (1) of section 6.1.6 is replaced by the following:

- '(1) Assessment of suitability for use according to the type validation of in service experience procedure (module CV) may be part of the assessment procedure for the following interoperability constituents:
- Wheels (see clause 6.1.3.1).
  - Automatic variable gauge system (see clause 6.1.3.1a).
  - Wheel slide protection system (see clause 6.1.3.2).
  - Contact strips (see clause 6.1.3.8).';

(61) in section 6.2.1, the text 'Article 18 and Annex VI of Directive 2008/57/EC' is replaced by the reference to 'Article 15 and Annex IV of Directive (EU) 2016/797';

(62) point (1) of section 6.2.3.3 is replaced by the following:

- '(1) The demonstration of conformity shall be carried out in accordance with one of the methods specified in the specification referenced in Appendix J-1, index 83.'

(63) section 6.2.3.4 is replaced by the following:

'6.2.3.4. Running dynamic behaviour – technical requirements (Clause 4.2.3.4.2 a)

- (1) For units designed to be operated on 1 435 mm or 1 524 mm or 1 668 mm system, the demonstration of conformity shall be carried out in accordance with the specification referenced in Appendix J-1, index 84, clause 7.

The parameters described in clauses 4.2.3.4.2.1 and 4.2.3.4.2.2 shall be assessed using criteria defined in the specification referenced in Appendix J-1, index 84.;

(64) point (3) of section 6.2.3.5 is replaced by the following:

‘(3) The compliance with the safety requirements that are specified in clauses 4.2.3.4.2, 4.2.3.5.3, 4.2.4.2.2, 4.2.5.3.5, 4.2.5.5.8 and 4.2.5.5.9 in terms of level of severity/consequences associated to hazardous failure scenarios shall be demonstrated by one of the two following methods:

1. Application of a harmonised risk acceptance criterion associated to the severity specified in the clause 4.2 (e.g. “fatalities” for emergency braking).

The applicant may choose to use this method, provided that there is an available harmonized risk acceptance criterion defined in the CSM on Risk Assessment and its amendments (Commission Implementing Regulation (EU) No 402/2013 (\*)).

The applicant shall demonstrate compliance with the harmonised criterion by applying Annex I-3 of the CSM on RA. The following principles (and their combinations) may be used for the demonstration: similarity with reference system(s); application of codes of practice; application of explicit risk estimation (e.g. probabilistic approach).

The applicant shall designate the body for the assessment of the demonstration he will provide: the notified body selected for the RST sub-system or an assessment body as defined in the CSM on RA.

The demonstration shall be recognized in all Member States; or

2. Application of a risk evaluation and assessment in accordance with the CSM on RA, in order to define the risk acceptance criterion to be used, and demonstrate compliance to this criterion.

The applicant may choose to use this method in any case.

The applicant shall designate the assessment body for the assessment of the demonstration he will provide, as defined in the CSM on RA.

A safety assessment report shall be provided in compliance with the requirements defined in the CSM on RA and its amendments.

The safety assessment report shall be taken into account by the Authorising Entity, in accordance with Section 2.5.6 of Annex I and Article 15(2) of the CSM on RA.

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(\*) Commission Implementing Regulation (EU) No 402/2013 of 30 April 2013 on the common safety method for risk evaluation and assessment and repealing Regulation (EC) No 352/2009 as referred to in Article 6(3)(a) of Directive 2004/49/EC of the European Parliament and of the Council (OJ L 121, 3.5.2013, p. 8).’;

(65) the second paragraph in point (1) of section 6.2.3.6 is replaced by the following:

‘The evaluation of the equivalent conicity is set out in the specification referenced in Appendix J-1, index 107.’;

(66) a new section 6.2.3.7a is added after section 6.2.3.7 as follows:

‘6.2.3.7a Automatic variable gauge system

- (1) The safety analysis required in clause 4.2.3.5.3 point (5), and performed at IC level, shall be consolidated at the level of the unit (vehicle); in particular, the assumptions made according to clause 6.1.3.1a point (3) may need to be reviewed to take into account the vehicle and its mission profile.
- (2) The assessment of the integration of the IC within the running gear/unit and the technical compatibility with the track gauge changeover facility shall consist of:

— The compliance with the area of use defined in clause 5.3.4.a (1) shall be verified,



- Verification of the correct integration of the IC within the running gear/unit, including the correct performance of its on-board control/monitoring system (when applicable), and
- On-track tests including tests on the track gauge changeover facility(ies), representative of in-service conditions.;

(67) section 6.2.3.13 is replaced by the following:

‘6.2.3.13. Slipstream effects on passengers on platform and on workers trackside (clause 4.2.6.2.1)

- (1) Demonstration of conformity with the limit value of trackside maximum permissible air speed set out in clause 4.2.6.2.1 of this TSI shall be demonstrated on the basis of full-scale tests on straight track performed in accordance with clause 6.2.2.1 of specification referenced in Appendix J-1, index 94.
- (2) Instead of the full assessment described above, it is permitted to carry out a simplified assessment for rolling stock of a similar design to rolling stock for which the full assessment defined in this TSI has been carried out. In such cases, the simplified conformity assessment defined in clause 4.2.4 of the specification referenced in Appendix J-1, index 94, can be applied as long as the differences in the design remain within the limits of table 7 of the specification referenced in Appendix J-1, index 94.;

(68) section 6.2.3.14 is replaced by the following:

‘6.2.3.14. Head pressure pulse (clause 4.2.6.2.2)

- (1) Conformity shall be assessed on the basis of full-scale tests under conditions specified in the specification referenced in Appendix J-1, index 95, clause 6.1.2.1. Alternatively conformity may be assessed by means of either validated Computational Fluid Dynamics (CFD) simulations as described in the specification referenced in Appendix J-1, index 95, clause 6.1.2.4 or as an additional alternative conformity is permitted to be assessed by moving model tests as specified in the specification referenced in Appendix J-1, index 95, clause 6.1.2.2.
- (2) Instead of the full assessment described above, it is permitted to carry out a simplified assessment for rolling stock of a similar design to rolling stock for which the full assessment defined in this TSI has been carried out. In such cases, the simplified conformity assessment defined in clause 4.1.4 of the specification referenced in Appendix J-1, index 95, can be applied as long as the differences in the design remain within the limits of table 4 of the specification referenced in Appendix J-1, index 95.;

(69) in section 6.2.6, the text ‘Article 18(3) of Directive 2008/57/EC’ is replaced by the reference to ‘Article 15(4) of Directive (EU) 2016/797’;

(70) a new section 6.2.7a is added after section 6.2.7 as follows:

‘6.2.7a *Additional optional requirements for units intended to be used in general operation*

- (1) The compliance with the following set of conditions (2) to (9) is optional and only aims to facilitate exchange of units intended for general operations. Compliance with these provisions does not assure full interchangeability of units and does not exempt the railway undertaking of its responsibilities regarding the use of these units in a train formation as defined in clause 6.2.7. If the applicant selects this option, a notified body has to assess the compliance within the EC verification procedure. This shall be reported in the certificate and in the technical documentation.
- (2) The unit shall be fitted with a manual coupling system as defined in clauses 4.2.2.2.3 b) and 5.3.2
- (3) The unit shall be fitted with an EN-UIC braking system as defined in the specification referenced in Appendix J-1, index 22.
- (4) The unit shall meet the requirements of this TSI at least within the temperature range T1 (– 25 °C to + 40 °C; nominal) as defined in clause 4.2.6.1 of this TSI and in the specification referenced in Appendix J-1, index 34.

- (5) The tail lights requested in clause 4.2.7.1 shall be provided by fixed tail lamps.
  - (6) If the unit is fitted with a gangway, the gangway shall fulfil the specification referenced in Appendix J-1, index 113.
  - (7) Power supply shall be compliant to point 4 of clause 4.2.11.6
  - (8) The physical interface between units for the signal transmission shall ensure that the cable and plug of at least one line is compatible with the 18-conductor cable defined in the plate 2 of the specification referenced in Appendix J-1, index 114.
  - (9) The unit shall be marked at least with the following markings in accordance with the specification referenced in Appendix J-1, index 115:
    - Length over buffers
    - Electric power supply;
- (71) in section 6.3.2, the text ‘Article 17 of Directive 2008/57/EC’ is replaced by the reference to ‘Article 14 of Directive (EU) 2016/797’;
- (72) in point (1) of section 7.1.1.1, the text ‘OTMs’ is replaced by the text ‘special vehicles, such as on-track machines’;
- (73) in point (1) of section 7.1.1.2.1, the text ‘in accordance with point (f) of Article 5(3) of Directive 2008/57/EC’ is replaced by the text ‘in accordance with point (f) of Article 4(3) of Directive (EU) 2016/797’;
- (74) in section 7.1.1.2.1, point (3) is replaced by the following:
- ‘(3) The application of this TSI to rolling stock which falls under one of the three cases above is not mandatory if one of the following conditions is met:
- In case the rolling stock is in the scope of the HS RST TSI 2008 or of the CR LOC&PAS TSI 2011, the relevant TSI(s), including implementation rules and period of validity of the “type or design examination certificate” (7 years) are applied. This provision shall not apply to vehicles that are not conform to the HS RST TSI 2008 or to the CR LOC&PAS TSI 2011 and that are placed on the market after 31 May 2017.
  - In case the rolling stock is in the scope of neither the HS RST TSI 2008 nor the CR LOC&PAS TSI 2011: the authorisation for placing on the market is delivered during a transition period ending on 31 December 2020.’;
- (75) in point (4) of section 7.1.1.2.1, the text ‘in service in accordance with Articles 22 to 25 of Directive 2008/57/EC’ is replaced by the text ‘on the market in accordance with Article 21 of Directive (EU) 2016/797’;
- (76) in point (1) of section 7.1.1.2.2, the text ‘Article 2(t) of the Directive 2008/57/EC’ is replaced by the text ‘point (23) of Article 2 of Directive (EU) 2016/797’;
- (77) in section 7.1.1.3, the title ‘Application to mobile equipment for railway infrastructure construction and maintenance’ is replaced by the title ‘Application to special vehicles, such as on-track machines’;
- (78) in point (3) of section 7.1.1.3, the text ‘in accordance with Article 24 or 25 of Directive 2008/57/EC’ is replaced by the text ‘in accordance with Article 21 of Directive (EU) 2016/797 against national rules as regards the basic parameters of this TSI’;
- (79) in point (3) of section 7.1.1.4, the text ‘in accordance with Article 24 or 25 of Directive 2008/57/EC’ is replaced by the text ‘in accordance with Article 21 of Directive (EU) 2016/797 against national rules as regards the basic parameters of this TSI’;
- (80) in section 7.1.1.4a, the reference to section ‘4.2.8.2.8’ is replaced by the reference to ‘4.2.8.2.8.4’;

(81) in point (1) of section 7.1.1.5, the text ‘three years after the date of application of this TSI’ is replaced by the text ‘on 1 January 2018’;

(82) in section 7.1.1, a new section 7.1.1.8 is added below section 7.1.1.7 as follows:

#### ‘7.1.1.8 Transitional measure for passive safety requirement

Requirements set out in 4.2.2.5(6) shall not be mandatory during a transition period ending on 1 January 2022 for locomotives with a single “central cab” which, on 27 May 2019, are projects at an advanced stage of development, contracts in course of performance and rolling stock of an existing design as set out in point 7.1.1.2 of this TSI.

When the requirements set out in 4.2.2.5(6) are not applied, it is permitted as an alternative method, to demonstrate compliance against the requirement of scenario 3 of 4.2.2.5(5) by demonstrating compliance with following criteria:

- the frame of the locomotive is designed according to the specification referenced in Appendix J-1, index 7 cat L (as already specified in clause 4.2.2.4 of this TSI),
- the distance between the buffers and the cab windscreen is at least 2,5 m.;

(83) section 7.1.2 is replaced by the following:

#### ‘7.1.2 Changes to an existing rolling stock or rolling stock type

##### 7.1.2.1 Introduction

- (1) This clause 7.1.2 defines the principles to be applied by the entities managing the change and authorising entities in line with the EC verification procedure described in Article 15(9), Article 21(12) and Annex IV of Directive (EU) 2016/797. This procedure is further developed in Article 13, 15 and 16 of Commission Implementing Regulation (EU) 2018/545 (\*) and in Decision 2010/713/EU (\*\*).
- (2) This clause 7.1.2 applies in case of any change(s) to an existing rolling stock or rolling stock type, including renewal or upgrade. It does not apply in case of changes:
  - that do not introduce a deviation from the technical files accompanying the EC declarations for verification for the subsystems, if any, and
  - that do not have an impact on basic parameters not covered by the EC declaration, if any.

The holder of the vehicle type authorisation shall provide, under reasonable conditions, the information necessary for assessing the changes to the entity managing the change.

##### 7.1.2.2 Rules to manage changes in both rolling stock and rolling stock type

- (1) Parts and basic parameters of the rolling stock that are not affected by the change(s) are exempt from conformity assessment against the provisions in this TSI.
- (2) Without prejudice to clause 7.1.2.2a, compliance with the requirements of this TSI, the TSI Noise (Commission Regulation (EC) No 1304/2014, see clause 7.2 of that TSI) and the TSI PRM (Commission Regulation (EU) No 1300/2014 (\*\*\*) , see clause 7.2.3 of that TSI) shall only be needed for the basic parameters in this TSI which may be affected by the change(s).
- (3) In accordance with Articles 15 and 16 of Commission Implementing Regulation (EU) 2018/545 and Decision 2010/713/EU and by application of modules SB, SD/SF or SH1 for the EC verification, and if relevant in accordance with Article 15(5) of Directive (EU) 2016/797, the entity managing the change shall inform a notified body of all changes affecting the conformity of the subsystem with requirements of the relevant TSI(s) requiring new checks by a notified body. This information shall be provided by the entity managing the change with corresponding references to the technical documentation relating to the existing EC type or design examination certificate.

- (4) Without prejudice of the general safety judgement mandated in article 21(12)(b) of Directive (EU) 2016/797, in case of changes requiring reassessment of the safety requirements set out in clauses 4.2.3.4.2, 4.2.3.5.3, 4.2.4.2.2, 4.2.5.3.5, 4.2.5.5.8 and 4.2.5.5.9, the procedure set out in clause 6.2.3.5 shall be applied. Table 17 sets out when a new authorisation is required.

Table 17

		Vehicle originally assessed against...		
		First method of clause 6.2.3.5(3)	Second method of clause 6.2.3.5(3)	No CSM on RA applied
Change assessed against...	First method of clause 6.2.3.5(3)	No new authorisation required	Check (*)	No new authorisation required
	Second method of clause 6.2.3.5(3)	Check (*)	Check (*)	Check (*)
	No CSM on RA applied	Not possible	Not possible	Not possible

(\*) The word "Check" means that the applicant will apply Annex I of the CSM on RA in order to demonstrate that the changed vehicle ensures an equal or higher level of safety. This demonstration shall be independently assessed by an assessment body as defined in CSM on RA. If the body concludes that the new safety assessment demonstrates a lower level of safety or the result is unclear, the applicant shall request an authorization for placing on the market.

- (4a) Without prejudice of the general safety judgement mandated in Article 21(12)(b) of Directive (EU) 2016/797, in case of changes impacting requirements set out in 4.2.4.9, 4.2.9.3.1 and 4.2.10.3.4 which require a new reliability study, a new authorisation for placing in the market shall be required unless the NoBo concludes that the safety-related requirements covered by the reliability study are improved or maintained. The NoBo will consider in its judgement the revised maintenance and operation documentation, where required.
- (5) National migration strategies related to the implementation of other TSIs (e.g. TSIs covering fixed installations) shall be taken into account when defining to what extent the TSIs covering rolling stock needs to be applied.
- (6) The basic design characteristics of the rolling stock are defined in Table 17a and Table 17b. Based on these tables and on the safety judgement mandated in Article 21(12)(b) of Directive (EU) 2016/797, the changes shall be categorised as follows:
- (a) 15(1)(c) of Commission Implementing Regulation (EU) 2018/545 if they are above the thresholds set out in column 3 and below thresholds set out in column 4 unless the safety judgement mandated in Article 21(12)(b) of Directive (EU) 2016/797 requires to categorise them as 15(1)(d), or
- (b) 15(1)(d) of Commission Implementing Regulation (EU) 2018/545 if they are above the thresholds set out in column 4 or if the safety judgement mandated in Article 21(12)(b) of Directive (EU) 2016/797 requires to categorise them as 15(1)(d).

The determination whether the changes are beyond or above the thresholds mentioned above shall be done in reference to the values of the parameters at the time of the last authorisation of the rolling stock or rolling stock type,

- (7) Changes not covered by point 7.1.2.2(6) above are deemed not to have any impact on the basic design characteristics and may be categorised as 15(1)(a) or 15(1)(b) of Commission Implementing Regulation (EU) 2018/545, unless the safety judgement mandated in Article 21(12)(b) of Directive (EU) 2016/797 requires to categorise them as 15(1)(d).
- (8) The safety judgement mandated in Article 21(12)(b) of Directive (EU) 2016/797 shall cover changes concerning basic parameters of the table of section 3.1, related to all the essential requirements, in particular the requirements “Safety” and “Technical compatibility”.
- (9) Without prejudice to clause 7.1.2.2a, all changes shall remain compliant with the applicable TSIs regardless their classification.
- (10) The replacement of one or more vehicle(s) within a fixed formation after a severe damage does not require a conformity assessment against this TSI, as long as the unit or the vehicle(s) are unchanged in technical parameters and function to the ones they replace. Such units must be traceable and certified in accordance with any national or international rule, or any code of practice widely acknowledged in the railway domain.

Table 17a

**Basic design characteristics related to basic parameters set out in the LOC&PAS TSI**

1. TSI clause	2. Related basic design characteristic(s)	3. Changes impacting the basic design characteristic and not classified as 21(12)(a) of Directive (EU) 2016/797	4. Changes impacting the basic design characteristic and classified as 21(12)(a) of Directive (EU) 2016/797
4.2.2.2.3 End coupling	Type of end coupling	Change of end coupler type	N/A
4.2.2.10 Load conditions and weighed mass 4.2.3.2.1 Axle load parameter	Design mass in working order Design mass under normal payload Design mass under exceptional payload Maximum design speed (km/h) Static axle load in working order Static axle load under exceptional payload Vehicle length Static axle load under normal payload Position of the axles along the unit (axle spacing)	Change in any of the corresponding basic design characteristics resulting in a change of the line category(ies) the vehicle is compatible with	N/A

1. TSI clause	2. Related basic design characteristic(s)	3. Changes impacting the basic design characteristic and not classified as 21(12)(a) of Directive (EU) 2016/797	4. Changes impacting the basic design characteristic and classified as 21(12)(a) of Directive (EU) 2016/797
	Total vehicle mass (for each vehicle of the unit)	Change in any of the corresponding basic design characteristics resulting in a change of the line category(ies) the vehicle is compatible with	Change of more than $\pm 10\%$
	Mass per wheel	Change in any of the corresponding basic design characteristics resulting in a change of the line category(ies) the vehicle is compatible with or Change of more than $\pm 10\%$	N/A
4.2.3.1 Gauging	Reference profile	N/A	Change of reference profile the vehicle is conform to
	Minimum vertical convex curve radius capability	Change in minimum vertical convex curve radius capability the vehicle is compatible with of more than $10\%$	N/A
	Minimum vertical concave curve radius capability	Change in minimum vertical concave curve radius capability the vehicle is compatible with of more than $10\%$	N/A
4.2.3.3.1 Rolling stock characteristics for the compatibility with train detection systems	Compatibility with train detection systems	N/A	Change of declared compatibility with one or more of the three following train detection systems: — Track circuits — Axle counters — Loop equipment
4.2.3.3.2 Axle bearing condition monitoring	On-board detection system	Fitting of on-board detection system	Removal of declared on-board detection system
4.2.3.4. Rolling stock dynamic behaviour	Combination of maximum speed and maximum cant deficiency for which the vehicle was assessed	N/A	Increase in maximum speed of more than $15\text{ km/h}$ or change of more than $\pm 10\%$ in maximum admissible cant deficiency
	Rail inclination	N/A	Change of rail inclination(s) the vehicle is conform to (*)
4.2.3.5.2.1. Mechanical and geometric characteristics of wheelsets	Wheelset gauge	N/A	Change of track gauge the wheelset is compatible with

1. TSI clause	2. Related basic design characteristic(s)	3. Changes impacting the basic design characteristic and not classified as 21(12)(a) of Directive (EU) 2016/797	4. Changes impacting the basic design characteristic and classified as 21(12)(a) of Directive (EU) 2016/797
4.2.3.5.2.2 Characteristics of wheels	Minimum required in-service wheel diameter	Change of minimum required in-service diameter of more than $\pm 10$ mm	N/A
4.2.3.5.2.3 Automatic variable gauge systems	Wheelset gauge changeover facility	Change in the vehicle leading to a change in the changeover facility(ies) the wheelset is compatible with	Change of track gauge(s) the wheelset is compatible with
4.2.3.6. Minimum curve radius	Minimum horizontal curve radius capability	Increase of minimum horizontal curve radius of more than 5 m	N/A
4.2.4.5.1 Braking performance — General requirements	Maximum average deceleration	Change of more than $\pm 10$ % on the maximum average brake deceleration	N/A
4.2.4.5.2 Braking performance – Emergency braking	Stopping distance and deceleration profile for each load condition per design maximum speed.	Change of stopping distance of more than $\pm 10$ % Note: Brake weight percentage (also called “lambda” or “braked mass percentage”) or braked mass may also be used, and can be derived (directly or via stopping distance) from deceleration profiles by a calculation. The allowed change is the same ( $\pm 10$ %)	N/A
4.2.4.5.3 Braking performance – Service braking	Stopping distance and maximum deceleration for the load condition “design mass under normal payload” at the design maximum speed	Change of stopping distance of more than $\pm 10$ %	N/A
4.2.4.5.4 Braking performance – Thermal capacity	Maximum brake thermal energy capacity  or  Thermal capacity in terms of maximum line gradient, associated length and operating speed	N/A  Change of maximum gradient, associated length or operating speed for which the brake system is designed in relation with brake thermal energy capacity	Change of maximum brake thermal energy $\geq 10$ %
4.2.4.5.5 Braking performance – Parking brake	Maximum gradient on which the unit is kept immobilized by the parking brake alone (if the vehicle is fitted with it)	Change of declared maximum gradient of more than $\pm 10$ %	N/A

1. TSI clause	2. Related basic design characteristic(s)	3. Changes impacting the basic design characteristic and not classified as 21(12)(a) of Directive (EU) 2016/797	4. Changes impacting the basic design characteristic and classified as 21(12)(a) of Directive (EU) 2016/797
4.2.4.6.2. Wheel slide protection system	Wheel slide protection system	N/A	Fitting/removal of WSP function
4.2.4.8.2 Magnetic track brake	Magnetic track brake	N/A	Fitting/removal of magnetic track brake function
	Possibility of preventing the use of the magnetic track brake	N/A	Fitting/removal of the brake control allowing the activation/deactivation of magnetic track brake
4.2.4.8.3 Eddy current track brake	Eddy current track brake	N/A	Fitting/removal of the eddy current track brake function
	Possibility of preventing the use of the eddy current track brake	N/A	Fitting/removal of the brake control allowing the activation/deactivation of eddy current track brake
4.2.6.1.1 Temperature	Temperature range	Change of temperature range (T1, T2, T3)	N/A
4.2.6.1.2 Snow, ice and hail	Snow, ice and hail conditions	Change of the selected range "snow, ice and hail" (nominal or severe)	N/A
4.2.8.2.2 Operation within range of voltages and frequencies	Energy supply system (voltage and frequency)	N/A	Change of voltage(s)/frequency(ies) of the energy supply system (AC 25 kV-50 Hz, AC 15 kV-16,7 Hz, DC 3 kV, DC 1,5 kV, DC 750 V, third rail, others)
4.2.8.2.3 Regenerative brake with energy to the overhead contact line	Regenerative brake	N/A	Fitting/removal of regenerative brake function
	Possibility of preventing the use of the regenerative brake when fitted	Fitting/removing the possibility of preventing the use of regenerative brake	N/A
4.2.8.2.4 Maximum power and current from the overhead contact line	<u>Applicable to Electric units with power higher than 2 MW only:</u> Power or current limitation function	Power or current limitation function fitted/removed	N/A



1. TSI clause	2. Related basic design characteristic(s)	3. Changes impacting the basic design characteristic and not classified as 21(12)(a) of Directive (EU) 2016/797	4. Changes impacting the basic design characteristic and classified as 21(12)(a) of Directive (EU) 2016/797
4.2.8.2.5 Maximum current at standstill for DC systems	Maximum current at standstill per pantograph for each DC system the vehicle is equipped for	Change of the maximum current value by 50 A without exceeding the limit set in the TSI	N/A
4.2.8.2.9.1.1 Height of interaction with contact wires (RST level)	Height of interaction of pantograph with contact wires (over top of rail)	Change of height of interaction allowing/no longer allowing mechanical contact with one of the contact wires at heights above rail level between: 4 800 mm and 6 500 mm 4 500 mm and 6 500 mm 5 550 mm and 6 800 mm 5 600 mm and 6 600 mm	N/A
4.2.8.2.9.2 Pantograph head geometry (IC level)	Pantograph head geometry	N/A	Change of pantograph head geometry to or from one of the types defined in clauses 4.2.8.2.9.2.1, 4.2.8.2.9.2.2 or 4.2.8.2.9.2.3
4.2.8.2.9.4.2 Contact strip material	Contact strip material	New contact strip as per 4.2.8.2.9.4.2(3)	N/A
4.2.8.2.9.6 Pantograph contact force and dynamic behaviour	Mean contact force curve	Change requiring a new assessment of pantograph dynamic behaviour.	N/A
4.2.8.2.9.7 Arrangement of pantographs (RST level)	Number of pantograph and shortest distance between two pantographs	N/A	Where the spacing of 2 consecutive pantographs in fixed or predefined formations of the assessed unit is reduced by means of removing a vehicle
4.2.8.2.9.10 Pantograph lowering (RST level)	Automatic dropping device (ADD)	Automatic dropping device (ADD) function fitted/removed	N/A
4.2.10.1. General and categorisation	Fire safety category	N/A	Change of fire safety category
4.2.12.2. General documentation — number of units in multiple operation	Maximum number of trainsets or locomotives coupled together in multiple operation.	N/A	Change of maximum allowed number of trainsets or locomotives coupled together in multiple operation

1. TSI clause	2. Related basic design characteristic(s)	3. Changes impacting the basic design characteristic and not classified as 21(12)(a) of Directive (EU) 2016/797	4. Changes impacting the basic design characteristic and classified as 21(12)(a) of Directive (EU) 2016/797
4.2.12.2. General documentation – number of vehicles in a unit	For fixed formations only: Vehicles composing the fixed formation	N/A	Change in the number of vehicles composing the fixed formation

(\*) The rolling stock fulfilling one of the following conditions are deemed to be compatible with all rail inclinations:

- Rolling stock assessed according to EN 14363:2016
- Rolling stock assessed according to EN 14363:2005 (amended or not amended by ERA/TD/2012-17/INT) or UIC 518:2009 with the result, that there is no restriction to one rail inclination
- Rolling stock assessed according to EN 14363:2005 (amended or not amended by ERA/TD/2012-17/INT) or UIC 518:2009 with the result, that there is a restriction to one rail inclination and a new assessment of the wheel-rail-contact test conditions based on real wheel- and rail profiles and measured track gauge show compliance with the requirements on wheel-rail-contact conditions of EN 14363:2016.

Table 17b

### Basic design characteristics related to basic parameters set out in the PRM TSI

1. TSI clause	2. Related basic design characteristic(s)	3. Changes impacting the basic design characteristic and not classified as 21(12)(a) of Directive (EU) 2016/797	4. Changes impacting the basic design characteristic and classified as 21(12)(a) of Directive (EU) 2016/797
4.2.2.11. Step position for vehicle access and egress	Platform heights for which the vehicle is designed	N/A	Change of platform height the vehicle is compatible with

(11) In order to establish the EC type or design examination certificate, the notified body selected by the entity managing the change is permitted to refer to:

- The original EC type or design examination certificate for parts of the design that are unchanged or those that are changed but do not affect the conformity of the subsystem, as far as it is still valid (during 7 years phase B period).
- Additional EC type or design examination certificate (amending the original certificate) for modified parts of the design that affect the conformity of the subsystem with the latest revision of this TSI in force at that time.

(12) In any case, the entity managing the change shall ensure that the technical documentation which is relating to the EC type or design examination certificate is updated accordingly.

(13) The updated technical documentation, related to the EC type or design examination certificate is referred to in the technical file accompanying the EC declaration of verification issued by the entity managing the change for rolling stock declared as conformant to the modified type.

7.1.2.2a Particular rules for existing rolling stock not covered by an EC declaration of verification with a first authorisation for placing in service before 1 January 2015

(1) The following rules apply, in addition to clause 7.1.2.2, to existing rolling stock with a first authorisation for placing in service before 1 January 2015, where the scope of the change has an impact on basic parameters not covered by the EC declaration (if any).

- (2) The compliance with technical requirements of this TSI is deemed established when a basic parameter is improved in the direction of the TSI defined performance and the entity managing the change demonstrates that the corresponding essential requirements are met and the safety level is maintained and, where reasonably practicable, improved. The entity managing the change shall in this case justify the reasons for which the TSI defined performance was not met, taking into account paragraph 3 of section 7.1.2.2. This justification shall be included in the technical file, if any, or in the original technical documentation of the vehicle.
- (3) The particular rule set out in paragraph (2) above is not applicable to changes to basic parameters classified as 21(12)(a) in table 17c and 17d. For those changes, compliance with the TSI requirements is mandatory.

Table 17c

**Changes to basic parameters for which compliance with TSI requirements is mandatory for rolling stock not holding an EC type or design examination certificate**

TSI clause	Related basic design characteristic(s)	Changes impacting the basic design characteristic and classified as 21(12)(a) of Directive (EU) 2016/797
4.2.3.1 Gauging	Reference profile	Change of reference profile the vehicle is conform to
4.2.3.3.1 Rolling stock characteristics for the compatibility with train detection systems	Compatibility with train detection systems	Change of declared compatibility with one or more of the three following train detection systems: — Track circuits — Axle counters — Loop equipment
4.2.3.3.2 Axle bearing condition monitoring	On-board detection system	Fitting/Removal of declared on-board detection system
4.2.3.5.2.1. Mechanical and geometric characteristics of wheelsets	Wheelset gauge	Change of track gauge the wheelset is compatible with
4.2.3.5.2.3 Automatic variable gauge systems	Wheelset gauge changeover facility	Change of track gauge(s) the wheelset is compatible with
4.2.8.2.3 Regenerative brake with energy to the overhead contact line	Regenerative brake	Fitting/removal of regenerative brake function

Table 17d

**Changes to basic parameters of the PRM TSI for which compliance with TSI requirements is mandatory for rolling stock not holding an EC type or design examination certificate**

TSI clause	Related basic design characteristic(s)	Changes impacting the basic design characteristic and classified as 21(12)(a) of Directive (EU) 2016/797
4.2.2.11. Step position for vehicle access and egress	Platform heights for which the vehicle is designed	Change of platform height the vehicle is compatible with

7.1.2.2b. Particular rules for vehicles modified to test performance or reliability of technological innovations for a limited period of time

- (1) The following rules apply, in addition to clause 7.1.2.2, in case of modifications to single authorised vehicles for the purpose of testing the performance and reliability of technological innovations for a fixed period of time not longer than 1 year. They don't apply if the same modifications are made to several vehicles.
- (2) The compliance with technical requirements of this TSI is deemed established when a basic parameter is kept unchanged or improved in the direction of the TSI defined performance and the entity managing the change demonstrates that the corresponding essential requirements are met and the safety level is maintained and, where reasonably practicable, improved

(\*) Commission Implementing Regulation (EU) 2018/545 of 4 April 2018 establishing practical arrangements for the railway vehicle authorisation and railway vehicle type authorisation process pursuant to Directive (EU) 2016/797 of the European Parliament and of the Council (OJ L 90, 6.4.2018, p. 66).

(\*\*) Commission Decision 2010/713/EU of 9 November 2010 on modules for the procedures for assessment of conformity, suitability for use and EC verification to be used in the technical specifications for interoperability adopted under Directive 2008/57/EC of the European Parliament and of the Council (OJ L 319, 4.12.2010, p. 1).

(\*\*\*) Commission Regulation (EU) No 1300/2014 of 18 November 2014 on the technical specifications for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility (OJ L 356, 12.12.2014, p. 110).;

(84) the title of section 7.1.3 '*Rules related to the type or design examination certificates*' is replaced by '*Rules related to the EC type or design examination certificates*';

(85) section 7.1.3.1 is replaced by the following:

7.1.3.1. Rolling stock subsystem

- (1) This clause concerns a rolling stock type (unit type in the context of this TSI), as defined in Article 2(26) of Directive (EU) 2016/797, which is subject to a EC type or design verification procedure in accordance with the section 6.2 of this TSI. It also applies to the EC type or design verification procedure in accordance with the TSI Noise (Commission Regulation (EU) No 1304/2014 (\*)), and the TSI PRM (Commission Regulation (EU) No 1300/2014) which refers to this TSI for its scope of application to Locomotives and Passenger rolling Stock.
- (2) The TSI assessment basis for a "EC type or design examination" is defined in columns 2 and 3 "Design review" and "Type test" of Appendix H of this TSI.

**Phase A**

- (3) Phase A starts once a notified body, which is responsible for EC verification, is appointed by the applicant and ends when the EC type or design examination certificate is issued.
- (4) The TSI assessment basis for a type is defined for a phase A period, with a duration of maximum seven years. During the phase A period the assessment basis for EC verification to be used by the notified body will not change.
- (5) When a revision of this TSI or of the TSI Noise or the TSI PRM comes into force during the phase A period, it is permissible (but not mandatory) to use the revised version, either totally or for particular sections, unless explicitly otherwise specified in the revision of these TSIs; in case of application limited to particular sections, the applicant has to justify and document that applicable requirements remain consistent, and this has to be approved by the notified body.

**Phase B**

- (6) The phase B period defines the period of validity of the EC type or design examination certificate once it is issued by the notified body. During this time, units may be EC certified on the basis of conformity to type.

- (7) The EC type or design examination certificate of EC verification for the subsystem is valid for a seven year phase B period after its issue date, even if a revision of this TSI or of the TSI Noise or the TSI PRM comes into force, unless explicitly otherwise specified in the revision of these TSIs. During this period of validity, new rolling stock of the same type is permitted to be placed on the market on the basis of an EC declaration of verification referring to the type certificate of verification.

(\*) Commission Regulation (EU) No 1304/2014 of 26 November 2014 on the technical specification for interoperability relating to the subsystem “rolling stock — noise” amending Decision 2008/232/EC and repealing Decision 2011/229/EU (OJ L 356, 12.12.2014, p. 421).;

(86) Section 7.2 is amended as follows:

- (a) the reference to ‘Article 34 of Directive 2008/57/EC’ is replaced by the reference to ‘Article 48 of Directive (EU) 2016/797’;
- (b) the text ‘Article 35 of Directive 2008/57/EC and Commission Implementing Decision 2011/633/EU’ is replaced by the text ‘Article 48 of Directive (EU) 2016/797 and Commission Implementing Regulation (EU) 2019/777 (\*)’.

(\*) Commission Implementing Regulation (EU) 2019/777 of 16 May 2019 on the common specifications for the register of railway infrastructure and repealing Implementing Decision 2014/880/EU [RINF] (OJ L 139 I, 27.5.2019, p. 312);

(87) Point (2) of section 7.3.1 is replaced by the following:

‘(2) These specific cases are classified as:

- “P” cases: “permanent” cases,
- “T0”: “temporary” cases of indefinite duration, where the target system shall be reached by a date still to be determined.
- “T1” cases: “temporary” cases, where the target system shall be reached by 31 December 2025.
- “T2” cases: “temporary” cases, where the target system shall be reached by 31 December 2035.

All specific cases and their relevant dates shall be re-examined in the course of future revisions of the TSI with a view to limiting their technical and geographical scope based on an assessment of their impact on safety, interoperability, cross border services, TEN-T corridors, and the practical and economic impacts of retaining or eliminating them. Special account shall be given to availability of EU funding.

Specific cases shall be limited to the route or network where they are strictly necessary and taken account of through route compatibility procedures.;

(88) a new point (6) is added below point (5) of section 7.3.1 as follows:

‘(6) In case of a specific case applicable to a component defined as interoperability constituent in section 5.3 of this TSI, the conformity assessment has to be made according to the clause 6.1.1 point (3).’;

(89) in section 7.3.2.3, the following text is deleted:

**‘Specific case Portugal (“P”)**

For units intended to operate on Portuguese network (1 668 mm track gauge) and which depends on track side equipment for axle bearing condition monitoring, the target area that shall remain unobstructed to permit observation by a trackside HABD and its position related to centre line vehicle shall be the following:

- YTA = 1 000 mm (lateral position of the centre of the target area relative to the centre line of the vehicle)
- WTA ≥ 65 mm (lateral width of the target area)

- LTA  $\geq$  100 mm (longitudinal length of the target area)
- YPZ = 1 000 mm (lateral position of the centre of the prohibitive zone relative to the centre line of the vehicle)
- WPZ  $\geq$  115 mm (lateral width of the prohibitive zone)
- LPZ  $\geq$  500 mm (longitudinal length of the prohibitive zone)

#### **Specific case Spain (“P”)**

For rolling stock intended to be used on the Spanish network (1 668 mm track gauge) and which depends on track side equipment for axle bearing condition monitoring, the zone visible to the trackside equipment on rolling stock shall be the area as defined in EN 15437-1:2009 clauses 5.1 and 5.2 considering the following values instead of the stated ones:

- YTA = 1 176  $\pm$  10 mm (lateral position of the centre of the target area relative to the centre line of the vehicle)
- WTA  $\geq$  55 mm (lateral width of the target area)
- LTA  $\geq$  100 mm (longitudinal length of the target area)
- YPZ = 1 176  $\pm$  10 mm (lateral position of the centre of the prohibitive zone relative to the centre line of the vehicle)
- WPZ  $\geq$  110 mm (lateral width of the prohibitive zone)
- LPZ  $\geq$  500 mm (longitudinal length of the prohibitive zone);

(90) in section 7.3.2.3, the text ‘**Specific case Sweden (“T”)**’ is replaced by the text ‘**Specific case Sweden (“T1”)**’;

(91) section 7.3.2.4 is replaced by the following:

‘7.3.2.4. Safety against derailment running on twisted track (4.2.3.4.1)

#### **Specific case United Kingdom (Great Britain) (“P”)**

It is permissible for all units and cases to use Method 3 set out in EN14363:2016 clause 6.1.5.3.1.

This specific case does not prevent the access of TSI compliant rolling stock to the national network.’;

(92) section 7.3.2.5 is replaced by the following:

‘7.3.2.5. Running dynamic behaviour (4.2.3.4.2, 6.2.3.4)

#### **Specific case Finland (“P”)**

The following modifications to the running dynamic behaviour clauses of the TSI applies to vehicle to be operated solely on Finnish 1 524 mm network:

- Test zone 4 is not applicable for running dynamic testing.
- Mean value of curve radius of all track sections for test zone 3 shall be 550  $\pm$  50 metres for running dynamic testing.
- Track quality parameters in running dynamics testing shall be according to RATO 13 (Track inspection).
- Measuring methods are according to EN 13848:2003+A1.

#### **Specific case Ireland and UK for Northern Ireland (“P”)**

For technical compatibility with the existing network it is permissible to use notified national technical rules for the purpose of assessing running dynamic behaviour.

**Specific case Spain (“P”)**

For rolling stock intended to be used on 1 668 mm track gauge, the quasi-static guiding force  $Y_{qst}$  limit value shall be evaluated for curve radii

$$250 \text{ m} \leq R_m < 400 \text{ m.}$$

The limit value shall be:  $(Y_{qst})_{lim} = 66 \text{ kN}$ .

For the normalisation of the estimated value to the radius  $R_m = 350 \text{ m}$  according to clause 7.6.3.2.6 (2) of EN 14363:2016, the formula “ $Y_{a,nf,qst} = Y_{a,f,qst} - (10\,500 \text{ m}/R_m - 30) \text{ kN}$ ” shall be replaced by “ $Y_{a,nf,qst} = Y_{a,f,qst} - (11\,550 \text{ m}/R_m - 33) \text{ kN}$ ”.

Values of cant deficiency can be adapted to 1 668 mm track gauge by multiplying the corresponding 1 435 mm parameter values by the following conversion factor: 1733/1500.

**Specific case the United Kingdom (Great Britain) (“P”)**

For technical compatibility with the existing network it is permissible to use national technical rules amending EN 14363 requirements and notified for the purpose of running dynamic behaviour. This specific case does not prevent the access of TSI compliant rolling stock to the national network.;

(93) In section 7.3.2.6, table 21 is replaced by the following table:

	Designation	Wheel diameter D (mm)	Minimum value (mm)	Maximum value (mm)
1 600 mm	Width of the rim ( $B_R$ ) (with maximum BURR of 5 mm)	$690 \leq D \leq 1\,016$	137	139
	Thickness of the flange ( $S_d$ )	$690 \leq D \leq 1\,016$	26	33
	Height of the flange ( $S_h$ )	$690 \leq D \leq 1\,016$	28	38
	Face of the flange ( $q_R$ )	$690 \leq D \leq 1\,016$	6,5	—

(94) In section 7.3.2.6, table 22 is replaced by the following table:

	Designation	Wheel diameter D (mm)	Minimum value (mm)	Maximum value (mm)
1 600 mm	Front-to-front dimension (SR) $SR = AR + S_d, \text{ left} + S_d, \text{ right}$	$690 \leq D \leq 1\,016$	1 573	1 593,3
	Back to back distance (AR)	$690 \leq D \leq 1\,016$	1 521	1 527,3
	Width of the rim (BR) (with maximum BURR of 5 mm)	$690 \leq D \leq 1\,016$	127	139
	Thickness of the flange ( $S_d$ )	$690 \leq D \leq 1\,016$	24	33
	Height of the flange ( $S_h$ )	$690 \leq D \leq 1\,016$	28	38
	Face of the flange ( $q_R$ )	$690 \leq D \leq 1\,016$	6,5	—

(95) in section 7.3.2.6, below Table 22, the text ‘**Specific case Spain (“P”)**’ of clause 7.3.2.6 is replaced by ‘**Specific case Spain for 1 668 mm track gauge (“P”)**’;

(96) a new section 7.3.2.6a is added after section 7.3.2.6:

‘7.3.2.6a Minimum curve radius (4.2.3.6)

**Specific case Ireland (“P”)**

In the case of track gauge system 1 600 mm, the minimum curve radius to be negotiated shall be 105 m for all units;’

(97) in section 7.3.2.10, the text ‘clause 7.4.2.8.1’ is replaced by ‘clause 7.4.2.9.1’;

(98) section 7.3.2.11 is amended as follows:

- The text ‘Specific case Estonia (“T”)
- The text ‘Specific case France (“T”)
- The text ‘Specific case Latvia (“T”)

(99) in section 7.3.2.11, the text ‘clause 7.4.2.3.1’ is replaced by ‘clause 7.4.2.4.1’;

(100) in section 7.3.2.12, the text ‘(“T”)’ is replaced by the text ‘(“T1”)’;

(101) section 7.3.2.14, is amended as follows:

- The text ‘Specific case Croatia (“T”)
- The text ‘Specific case Finland (“T”)
- The text ‘Specific case France (“T”)
- The text ‘Specific case Italy (“T”)
- The text ‘Specific case Portugal (“T”)
- The text ‘Specific case Slovenia (“T”)
- The text ‘Specific case Sweden (“T”)

(102) section 7.3.2.16, is amended as follows:

- The text ‘Specific case France (“T”)
- The text ‘Specific case Sweden (“T”)

(103) in section 7.3.2.20, the text ‘Specific case Italy (“T”)

(104) in section 7.3.2.20, the following paragraph is added:

**‘Review clause:**

At the latest by 31 July 2025, the Member State shall deliver to the Commission a report on possible alternatives to the above additional specifications, in order to remove or significantly reduce the constraints on rolling stocks caused by the non-compliance of the tunnels with the TSIs.’;

(105) in section 7.3.2.21, the text ‘Specific case Channel Tunnel (“T”)



(106) a new section 7.3.2.27 is added below section 7.3.2.26 as follows:

‘7.3.2.27. Rules to manage changes in both rolling stock and rolling stock type (7.1.2.2)

**Specific case the United Kingdom (Great Britain) (“P”)**

Any change to a vehicle swept envelope as defined in the national technical rules notified for the gauging process (for example as described in RIS-2773-RST) will be categorised as 15(1) (c) of Commission Implementing Regulation (EU) 2018/545, and will not be classified as 21(12)(a) of Directive (EU) 2016/797.’;

(107) a new section 7.5.1.3 is added below section 7.5.1.2 as follows:

‘7.5.1.3. Aerodynamic effects on ballasted tracks (clause 4.2.6.2.5)

Requirements on aerodynamic effects on ballasted tracks have been set up for units of maximum design speed higher than 250 km/h.

As the current state of the art does not allow to provide for a harmonized requirement nor assessment methodology, the TSI allows the application of national rules.

This will need to be reviewed in order to consider the following:

- Study of ballast-pick-up occurrences, and corresponding safety impact (if any)
- Development of a harmonized, cost-effective methodology applicable in EU.’;

(108) a new section 7.5.2.2 is added below section 7.5.2.1 as follows:

‘7.5.2.2. Conditions for having an authorization for placing on the market not limited to particular networks

In order to facilitate free circulation of locomotives and passenger coaches, conditions for having an authorization for placing on the market not limited to particular networks have been developed during the preparation of ERA recommendation ERA-REC-111-2015-REC of 17 December 2015.

These provisions should be further developed to adapt them to Directive (EU) 2016/797 and to take into account the cleaning up of national technical rules, with particular focus on passenger coaches.’;

(109) a new section 7.5.2.3 is added below section 7.5.2.2 as follows:

‘7.5.2.3. Rules for extension of area of use for existing rolling stock not covered by an EC declaration of verification

Pursuant to Article 54(2) and (3) of Directive (EU) 2016/797, vehicles authorised for placing in service prior to 15 June 2016 shall receive an authorization for placing on the market according to Article 21 of Directive (EU) 2016/797 in order to operate on one or more networks which are not yet covered by their authorisation. Such vehicles shall thus be conform to this TSI or benefit from a non-application of this TSI pursuant to Article 7(1) of Directive 2016/797/EC.

In order to facilitate the free movement of vehicles, provisions shall be developed to set out which level of flexibility could be granted to such vehicles as well as to vehicles which were not subject to authorization, as regards compliance with the TSI requirements while fulfilling the essential requirements, maintaining the appropriate safety level, and where reasonably practicable, improving it.’;

(110) section 7.5.3.1 is amended as follows:

- (a) the reference to ‘Directive 2008/57/EC’ is replaced by the reference to ‘Directive (EU) 2016/797’;
- (b) The text ‘in accordance with article 17 of Directive 2008/57/EC or through the Infrastructure Register referred to in article 35 of the same Directive’ is replaced by the text ‘in accordance with article 14 of Directive (EU) 2016/797 or through the Infrastructure Register referred to in article 49 of the same Directive’;

- (111) in the list 'APPENDICES' following Chapter 7, the text 'Appendix A: Buffer and draw gear' is replaced by 'Appendix A: Intentionally deleted';
- (112) the text of Appendix A is replaced by 'Intentionally deleted';
- (113) section C.3 of Appendix C is replaced by the following:

### **'C.3 Running dynamic behaviour**

The running characteristics are permitted to be determined by running tests or by reference to a similar type approved machine as detailed in clause 4.2.3.4.2 of this TSI or by simulation.

The following additional deviations from the specification referenced in Annex J-1, index 16 apply:

- The test shall always be taken as the simplified method for this type of machines
- when running tests according to the specification referenced in Annex J-1, index 16 are done with wheel profile in new condition, these are valid for a maximum distance of 50 000 km. After 50 000 km it is necessary to:
  - either re-profile the wheels;
  - or calculate the equivalent conicity of the worn profile and check that it does not differ more than 50 % from the value of the test of the specification referenced in Annex J-1, index 16 (with a maximum difference of 0,05);
  - or make a new test according to the specification referenced in Annex J-1, index 16 with worn wheel profile;
- in general, stationary tests to determine the parameters of characteristic running gear in accordance with the specification referenced in Annex J-1, index 16, clause 5.3.1 are not necessary;
- if the required test speed cannot be obtained by the machine itself, the machine shall be hauled for the tests.

Running behaviour can be proven by simulation of the tests described in to the specification referenced in Annex J-1, index 16 (with the exceptions as specified above) when there is a validated model of representative track and operating conditions of the machine.

A model of a machine for simulation of running characteristics shall be validated by comparing the model results against the results of running tests when the same input of track characteristic is used.

A validated model is a simulation model that has been verified by an actual running test that excites the suspension sufficiently and where there is a close correlation between the results of the running test and the predictions from the simulation model over the same test track.;

- (114) Appendix H is replaced by the following:

### *'Appendix H*

#### **Assessment of the rolling stock subsystem**

##### **H.1 Scope**

This Appendix indicates the assessment of conformity of the rolling stock subsystem.

##### **H.2 Characteristics and modules**

The sub-system characteristics to be assessed in the different phases of design, development and production are marked by X in Table H.1. A cross in column 4 of Table H.1 indicates that the relevant characteristics shall be verified by testing each single subsystem.

Table H.1

**Assessment of the rolling stock subsystem**

1		2	3	4	5
Characteristics to be assessed, as specified in clause 4.2 of this TSI		Design and development phase		Production phase	Particular assessment procedure
		Design review	Type Test	Routine Test	
Element of the Rolling Stock sub-system	Clause				Clause
<b>Structure and mechanical parts</b>	<b>4.2.2</b>				
Inner coupling	4.2.2.2.2	X	n.a.	n.a.	—
End coupling	4.2.2.2.3	X	n.a.	n.a.	—
IC automatic centre buffer coupler	5.3.1	X	X	X	—
IC manual end coupling	5.3.2	X	X	X	—
Rescue coupling	4.2.2.2.4	X	X	n.a.	—
IC rescue coupling	5.3.3	X	X	X	
Staff access for coupling and uncoupling	4.2.2.2.5	X	X	n.a.	—
Gangways	4.2.2.3	X	X	n.a.	—
Strength of vehicle structure	4.2.2.4	X	X	n.a.	—
Passive safety	4.2.2.5	X	X	n.a.	—
Lifting and jacking	4.2.2.6	X	X	n.a.	—
Fixing of devices to carbody structure	4.2.2.7	X	n.a.	n.a.	—
Staff and freight access doors	4.2.2.8	X	X	n.a.	—
Mechanical characteristics of glass	4.2.2.9	X	n.a.	n.a.	—
Load conditions and weighted mass	4.2.2.10	X	X	X	6.2.3.1
<b>Track interaction and gauging</b>	<b>4.2.3</b>				
Gauging	4.2.3.1	X	n.a.	n.a.	—
Wheel load	4.2.3.2.2	X	X	n.a.	6.2.3.2
Rolling Stock characteristics for compatibility with train detection systems	4.2.3.3.1	X	X	X	—
Axle bearing condition monitoring	4.2.3.3.2	X	X	n.a.	—

1		2	3	4	5
Characteristics to be assessed, as specified in clause 4.2 of this TSI		Design and development phase		Production phase	Particular assessment procedure
		Design review	Type Test	Routine Test	
Element of the Rolling Stock sub-system	Clause				Clause
Safety against derailment running on twisted track	4.2.3.4.1	X	X	n.a.	6.2.3.3
Running dynamic behaviour requirements	4.2.3.4.2 a)	X	X	n.a.	6.2.3.4
Active systems – safety requirement	4.2.3.4.2 b)	X	n.a.	n.a.	6.2.3.5
Limit values for running safety	4.2.3.4.2.1	X	X	n.a.	6.2.3.4
Track loading limit values	4.2.3.4.2.2	X	X	n.a.	6.2.3.4
Equivalent conicity	4.2.3.4.3	X	n.a.	n.a.	—
Design values for new wheel profiles	4.2.3.4.3.1	X	n.a.	n.a.	6.2.3.6
In-service values of wheelset equivalent conicity	4.2.3.4.3.2	X			—
Structural design of bogie frame	4.2.3.5.1	X	X.	n.a.	—
Mechanical and geometrical characteristics of wheelsets	4.2.3.5.2.1	X	X	X	6.2.3.7
Mechanical and geometrical characteristics of wheels	4.2.3.5.2.2	X	X	X	—
Wheels (IC)	5.3.2	X	X	X	6.1.3.1
Automatic variable gauge systems	4.2.3.5.3	X	X	X	6.2.3.7a
Automatic variable gauge systems (IC)	5.3.4a	X	X	X	6.1.3.1a
Minimum curve radius	4.2.3.6	X	n.a.	n.a.	—
Life guards	4.2.3.7	X	n.a.	n.a.	—
<b>Braking</b>	<b>4.2.4</b>				
Functional requirements	4.2.4.2.1	X	X	n.a.	—
Safety requirements	4.2.4.2.2	X	n.a.	n.a.	6.2.3.5
Type of brake system	4.2.4.3	X	X	n.a.	—

1		2	3	4	5
Characteristics to be assessed, as specified in clause 4.2 of this TSI		Design and development phase		Production phase	Particular assessment procedure
		Design review	Type Test	Routine Test	
Element of the Rolling Stock sub-system	Clause				Clause
<b>Brake command</b>	<b>4.2.4.4</b>				
Emergency braking	4.2.4.4.1	X	X	X	—
Service braking	4.2.4.4.2	X	X	X	—
Direct braking command	4.2.4.4.3	X	X	X	—
Dynamic braking command	4.2.4.4.4	X	X	n.a	—
Parking braking command	4.2.4.4.5	X	X	X	—
<b>Braking performance</b>	<b>4.2.4.5</b>				
General requirements	4.2.4.5.1	X	n.a	n.a	—
Emergency braking	4.2.4.5.2	X	X	X	6.2.3.8
Service braking	4.2.4.5.3	X	X	X	6.2.3.9
Calculations related to thermal capacity	4.2.4.5.4	X	n.a	n.a	—
Parking brake	4.2.4.5.5	X	n.a	n.a	—
Limit of wheel rail adhesion profile	4.2.4.6.1	X	n.a	n.a	—
Wheel slide protection system	4.2.4.6.2	X	X	n.a	6.2.3.10
Wheel slide protection system (IC)	5.3.5	X	X	X	6.1.3.2
Interface with traction — Braking systems linked to traction (electric, hydrodynamic)	4.2.4.7	X	X	X	—
<b>Braking system independent of adhesion conditions</b>	<b>4.2.4.8</b>				
General	4.2.4.8.1.	X	n.a	n.a	—
Magnetic track brake	4.2.4.8.2.	X	X	n.a	—
Eddy current track brake	4.2.4.8.3	X	X	n.a.	—
Brake state and fault indication	4.2.4.9	X	X	X	—

1		2	3	4	5
Characteristics to be assessed, as specified in clause 4.2 of this TSI		Design and development phase		Production phase	Particular assessment procedure
		Design review	Type Test	Routine Test	
Element of the Rolling Stock sub-system	Clause				Clause
Brake requirements for rescue purposes	4.2.4.10	X	X	n.a	—
<b>Passenger related items</b>	<b>4.2.5</b>				
Sanitary systems	4.2.5.1	X	n.a	n.a	6.2.3.11
Audible communication system	4.2.5.2	X	X	X	—
Passenger alarm	4.2.5.3	X	X	X	—
Passenger alarm – safety requir.	4.2.5.3	X	n.a	n.a	6.2.3.5
Communication devices for passengers	4.2.5.4	X	X	X	—
Exterior doors: access to and egress from Rolling Stock	4.2.5.5	X	X	X	—
Exterior doors – safety requir.	4.2.5.5	X	n.a	n.a	6.2.3.5
Exterior door system construction	4.2.5.6	X	n.a	n.a	—
inter-unit doors	4.2.5.7	X	X	n.a	—
Internal air quality	4.2.5.8	X	n.a	n.a	6.2.3.12
Body side windows	4.2.5.9	X			—
<b>Environmental conditions and aerodynamic effects</b>	<b>4.2.6</b>				
<b>Environmental conditions</b>	<b>4.2.6.1</b>				
Temperature	4.2.6.1.1	X	n.a. X <sup>(1)</sup>	n.a.	—
Snow, ice and hail	4.2.6.1.2	X	n.a. X <sup>(1)</sup>	n.a.	—
<sup>(1)</sup> Type test if and as defined by the Applicant.					
<b>Aerodynamic effects</b>	<b>4.2.6.2</b>				
Slipstream effects on passengers on platform and on workers trackside	4.2.6.2.1	X	X	n.a.	6.2.3.13

1		2	3	4	5
Characteristics to be assessed, as specified in clause 4.2 of this TSI		Design and development phase		Production phase	Particular assessment procedure
		Design review	Type Test	Routine Test	
Element of the Rolling Stock sub-system	Clause				Clause
Head pressure pulse	4.2.6.2.2	X	X	n.a.	6.2.3.14
Maximum pressure variations in tunnels	4.2.6.2.3	X	X	n.a.	6.2.3.15
Cross wind	4.2.6.2.4	X	n.a.	n.a.	6.2.3.16
<b>External lights &amp; visible and audible warning devices</b>	<b>4.2.7</b>				
<b>External front and rear lights</b>	<b>4.2.7.1</b>				
Head lights IC	4.2.7.1.1 5.3.6	X	X	n.a.	-6.1.3.3
Marker lights IC	4.2.7.1.2 5.3.7	X	X	n.a.	-6.1.3.4
Tail lights IC	4.2.7.1.3 5.3.8	X	X	n.a.	-6.1.3.5
Lamp controls	4.2.7.1.4	X	X	n.a.	—
<b>Horn</b>	<b>4.2.7.2</b>				
General – warning sound IC	4.2.7.2.1 5.3.9	X	X	n.a.	-6.1.3.6
Warning horn sound pressure levels	4.2.7.2.2 5.3.9	X	X	n.a.	6.2.3.17 6.1.3.6
Protection	4.2.7.2.3	X	n.a.	n.a.	—
Control	4.2.7.2.4	X	X	n.a.	—
<b>Traction and electrical equipment</b>	<b>4.2.8</b>				
<b>Traction performance</b>	<b>4.2.8.1</b>				
<b>General</b>	<b>4.2.8.1.1</b>				
Requirements on performance	4.2.8.1.2	X	n.a.	n.a.	—

1		2	3	4	5
Characteristics to be assessed, as specified in clause 4.2 of this TSI		Design and development phase		Production phase	Particular assessment procedure
		Design review	Type Test	Routine Test	
Element of the Rolling Stock sub-system	Clause				Clause
<b>Power supply</b>	<b>4.2.8.2</b>				
General	4.2.8.2.1	X	n.a	n.a	—
Operation within range of voltages and frequencies	4.2.8.2.2	X	X	n.a	—
Regenerative brake with energy to the overhead contact line	4.2.8.2.3	X	X	n.a	—
Maximum power and current from the overhead contact line	4.2.8.2.4	X	X	n.a	6.2.3.18
Maximum current at standstill for DC systems	4.2.8.2.5	X	X	n.a	—
Power factor	4.2.8.2.6	X	X	n.a	6.2.3.19
System energy disturbances	4.2.8.2.7	X	X	n.a	—
Energy consumption measuring function	4.2.8.2.8	X	X	n.a	—
Requirements linked to pantograph	4.2.8.2.9	X	X	n.a	6.2.3.20 & 21
Pantograph (IC)	5.3.10	X	X	X	6.1.3.7
Contact strips (IC)	5.3.11	X	X	X	6.1.3.8
Electrical protection of the train IC Main circuit breaker	4.2.8.2.10 5.3.12	X	X	n.a	—
Diesel and other thermal traction system	4.2.8.3	—	—	—	Other Directive
Protection against electrical hazards	4.2.8.4	X	X	n.a	—
<b>Cab and operation</b>	<b>4.2.9</b>				
Driver's Cab	4.2.9.1	X	n.a	n.a	—
General	4.2.9.1.1	X	n.a	n.a	—
Access and egress	4.2.9.1.2	X	n.a	n.a	—



1		2	3	4	5
Characteristics to be assessed, as specified in clause 4.2 of this TSI		Design and development phase		Production phase	Particular assessment procedure
		Design review	Type Test	Routine Test	
Element of the Rolling Stock sub-system	Clause				Clause
Access and egress in operating conditions	4.2.9.1.2.1	X	n.a	n.a	—
Driver's cab emergency exit	4.2.9.1.2.2	X	n.a	n.a	—
External visibility	4.2.9.1.3	X	n.a	n.a	—
Front visibility	4.2.9.1.3.1	X	n.a	n.a	—
Rear and side view	4.2.9.1.3.2	X	n.a	n.a	—
Interior layout	4.2.9.1.4	X	n.a	n.a	—
Driver's seat	4.2.9.1.5	X	n.a	n.a	—
IC	5.3.13	X	X	X	—
Driver's desk- Ergonomics	4.2.9.1.6	X	n.a	n.a	—
Climate control and air quality	4.2.9.1.7	X	X	n.a	6.2.3.12
Internal lighting	4.2.9.1.8	X	X	n.a	—
Windscreen-Mechanical characteristics	4.2.9.2.1	X	X	n.a	6.2.3.22
Windscreen-Optical characteristics	4.2.9.2.2	X	X	n.a	6.2.3.22
Windscreen-Equipment	4.2.9.2.3	X	X	n.a	—
<b>Driver machine interface</b>	<b>4.2.9.3</b>				
Driver's activity control function	4.2.9.3.1	X	X	X	—
Speed indication	4.2.9.3.2	—	—	—	—
Driver display unit and screens	4.2.9.3.3	X	X	n.a	—
Controls and indicators	4.2.9.3.4	X	X	n.a	—
Labelling	4.2.9.3.5	X	n.a	n.a	—
Radio remote control function by staff for shunting operation	4.2.9.3.6	X	X	n.a	—

1		2	3	4	5
Characteristics to be assessed, as specified in clause 4.2 of this TSI		Design and development phase		Production phase	Particular assessment procedure
		Design review	Type Test	Routine Test	
Element of the Rolling Stock sub-system	Clause				Clause
Onboard tools and portable equipment	4.2.9.4	X	n.a	n.a	—
Storage facility for staff personal effects	4.2.9.5	X	n.a	n.a	—
Recording device	4.2.9.6	X	X	X	—
<b>Fire safety and evacuation</b>	<b>4.2.10</b>				
General and categorisation	4.2.10.1	X	n.a	n.a	—
Measures to prevent fire	4.2.10.2	X	X	n.a	—
Measures to detect/control fire	4.2.10.3	X	X	n.a	—
Requirements related to emergencies	4.2.10.4	X	X	n.a	—
Requirements related to evacuation	4.2.10.5	X	X	n.a	—
<b>Servicing</b>	<b>4.2.11</b>				
Cleaning of driver's cab windscreen	4.2.11.2	X	X	n.a	—
Connection to toilet discharge system IC	4.2.11.3 5.3.14	X	n.a	n.a	—
Water refilling equipment	4.2.11.4	X	n.a	n.a	—
Interface for water refilling IC	4.2.11.5 5.3.15	X	n.a	n.a	—
Special requirements for stabling of trains	4.2.11.6	X	X	n.a	—
Refuelling equipment	4.2.11.7	X	n.a	n.a	—
Train interior cleaning – power supply	4.2.11.8	X	n.a	n.a	—
<b>Documentation for operation and maintenance</b>	<b>4.2.12</b>				
General	4.2.12.1	X	n.a	n.a	—

1		2	3	4	5
Characteristics to be assessed, as specified in clause 4.2 of this TSI		Design and development phase		Production phase	Particular assessment procedure
		Design review	Type Test	Routine Test	
Element of the Rolling Stock sub-system	Clause				Clause
General documentation	4.2.12.2	X	n.a	n.a	—
Documentation related to maintenance	4.2.12.3	X	n.a	n.a	—
The maintenance design justification file	4.2.12.3.1	X	n.a	n.a	—
The Maintenance description file	4.2.12.3.2	X	n.a	n.a	—
Operating documentation	4.2.12.4	X	n.a	n.a	—
Lifting diagram and instructions	4.2.12.4	X	n.a	n.a	—
Rescue related descriptions	4.2.12.5	X	n.a	n.a	—

(115) Appendix I is replaced by the following:

*‘Appendix I*

**Aspects for which the technical specification is not available  
(open points)**

Open points that relate to technical compatibility between the vehicle and the network:

Element of the Rolling Stock sub-system	Clause of this TSI	Technical aspect not covered by this TSI	Comments
Compatibility with train detection systems	4.2.3.3.1	See specification referenced in Annex J-2, index 1.	Open points also identified in the TSI CCS.
Running dynamic behaviour for 1 520 mm track gauge system	4.2.3.4.2 4.2.3.4.3	Running dynamic behaviour. Equivalent conicity.	Normative documents referred to in the TSI are based on experience gained on the 1 435 mm system.
Braking system independent of adhesion conditions	4.2.4.8.3	Eddy current track brake	Equipment not mandatory. Electromagnetic compatibility with concerned network.
Aerodynamic effect on ballasted track for RST of design speed > 250 km/h	4.2.6.2.5	Limit value and conformity assessment in order to limit risks induced by the projection of ballast	On-going work within CEN. Open point also in TSI INF.

Open points that do not relate to technical compatibility between the vehicle and the network:

Element of the Rolling Stock sub-system	Clause of this TSI	Technical aspect not covered by this TSI	Comments
Fire Containment and Control Systems	4.2.10.3.4	Conformity assessment of FCCS other than full partitions.	Assessment procedure of efficiency for controlling fire and smoke developed by CEN according to a request for standard issued by ERA.'

(116) Appendix J is replaced by the following:

'Appendix J

### Technical specifications referred to in this TSI

#### J.1 Standards or normative documents

Index No	TSI		Normative document	
	Characteristics to be assessed	Point	Document No	Mandatory points
1	Inner coupling for articulated units	4.2.2.2.2	EN 12663-1:2010 +A1:2014	6.5.3, 6.7.5
2	End coupling – manual UIC type – pipes interface	4.2.2.2.3	EN 15807:2011	relevant cl. (!)
3	End coupling – manual UIC type – end cocks	4.2.2.2.3	EN 14601:2005+ A1:2010	relevant cl. (!)
4	End coupling – manual UIC type – lateral location of brake pipe and cocks	4.2.2.2.3	UIC 648:Sept 2001	relevant cl. (!)
5	Rescue coupling — interface with recovery unit	4.2.2.2.4	UIC 648:Sept 2001	relevant cl. (!)
6	Staff access for coupling and uncoupling – space for shunting staff	4.2.2.2.5	EN 16839:2017	4
7	Strength of vehicle structure – general	4.2.2.4	EN 12663-1:2010 +A1:2014	relevant cl. (!)
	Strength of vehicle structure – categorisation of rolling stock			5.2
	Strength of vehicle structure – method of verification			9.2
	Strength of vehicle structure – alternative requirements for OTMs	Appendix C Section C.1		6.1 to 6.5

Index No	TSI		Normative document	
	Characteristics to be assessed	Point	Document No	Mandatory points
8	Passive safety – general	4.2.2.5	EprEN 15227:2017	relevant cl. (!) Except Annex A
	Passive safety – categorisation			5-table 1
	Passive safety – scenarios			5-table 3, 6.
	Passive safety – obstacle deflector			6.5
9	Lifting and jacking — geometry of permanent and removable points	4.2.2.6	EN 16404:2016	5.2, 5.3
10	Lifting and jacking — marking	4.2.2.6	EN 15877-2:2013	4.5.17
11	Lifting and jacking — strength method of verification	4.2.2.6	EN 12663-1:2010 +A1:2014	6.3.2, 6.3.3, 9.2
12	Fixing of devices to carbody structure	4.2.2.7	EN 12663-1:2010 +A1:2014	6.5.2
13	Load conditions and weighed mass – load conditions hypothesis of load conditions	4.2.2.10	EN 15663:2009 /AC:2010	2.1 relevant cl. (!)
14	Gauging – method, reference contours	4.2.3.1	EN 15273-2:2013 +A1:2016	relevant cl. (!)
	Gauging – method, reference contours verification of eddy current track brakes verification of pantograph gauge	4.2.4.8.3(3)		A.3.12
	Gauging – method, reference contours verification of eddy current track brakes verification of pantograph gauge	4.2.3.1		relevant cl. (!)
15	Axle bearing condition monitoring – zone visible to track side equipment	4.2.3.3.2.2	EN 15437-1:2009	5.1, 5.2
16	Running dynamic behaviour	4.2.3.4.2 Appendix C	EN 14363:2016	relevant cl. (!)
17	Running dynamic behaviour – limit values for running safety	4.2.3.4.2.1	EN 14363:2016	7.5

Index No	TSI		Normative document	
	Characteristics to be assessed	Point	Document No	Mandatory points
18	NOT USED			
19	Running dynamic behaviour – track loading limit values	4.2.3.4.2.2	EN 14363: 2016	7.5
20	Structural design of the bogie frame	4.2.3.5.1	EN 13749:2011	6.2, Annex C
21	Structural design of the bogie frame – body to bogie connection	4.2.3.5.1	EN 12663-1:2010 +A1:2014	relevant cl. (!)
22	Braking – type of brake system, UIC brake system	4.2.4.3 6.2.7a	EN 14198:2016	5.4
23	Braking performance – calculation – general	4.2.4.5.1	EN 14531-1:2005 or EN 14531-6:2009	relevant cl. (!)
24	Braking performance – friction coefficient	4.2.4.5.1	EN 14531-1:2005	5.3.1.4
25	Emergency braking performance – response time/delay time	4.2.4.5.2	EN 14531-1:2005	5.3.3
	Emergency braking performance –brake weight percentage			5.12
26	Emergency braking performance – calculation	4.2.4.5.2	EN 14531-1:2005 or EN 14531-6:2009	relevant cl. (!)
27	Emergency braking performance – friction coefficient	4.2.4.5.2	EN 14531-1:2005	5.3.1.4
28	Service braking performance – calculation	4.2.4.5.3	EN 14531-1:2005 or EN 14531-6:2009	relevant cl. (!)
29	Parking brake performance – calculation	4.2.4.5.5	EN 14531-1:2005 or EN 14531-6:2009	relevant cl. (!)
30	Wheel slide protection system – design	4.2.4.6.2	EN 15595:2009 +A1:2011	4
	Wheel slide protection system – verification method			5, 6
	Wheel slide protection system – wheel rotation monitoring system			4.2.4.3
31	Magnetic track brake	4.2.4.8.2	EN 16207:2014	Annex C

Index No	TSI		Normative document	
	Characteristics to be assessed	Point	Document No	Mandatory points
32	Door obstacle detection – sensitivity	4.2.5.5.3	EN 14752:2015	5.2.1.4.1
	Door obstacle detection – maximum force			5.2.1.4.2.2
33	Door emergency opening – manual force to open the door	4.2.5.5.9	EN 14752:2015	5.5.1.5
34	Environmental conditions – temperature	4.2.6.1.1	EN 50125-1:2014	4.3
35	Environmental conditions – snow, ice and hail conditions	4.2.6.1.2	EN 50125-1:2014	4.7
36	Environmental conditions – obstacle deflector	4.2.6.1.2	EN 15227:2008 +A1:2011	relevant cl. (!)
37	Aerodynamic effects –crosswind method of verification	4.2.6.2.4.	EN 14067-6:2010	5
38	Head lights – colour full-beam headlamp luminous intensity alignment	4.2.7.1.1	EN 15153-1:2013 +A1:2016	5.3.3
	Head lights – dimmed headlamp luminous intensity			5.3.5
	Head lights – full-beam headlamp luminous intensity			5.3.4 table 2 first line
	Head lights – alignment			5.3.4 table 2 first line
39	Marker lights – colour	4.2.7.1.2	EN 15153-1:2013 +A1:2016	5.3.5
	Marker lights – spectral radiation distribution			5.4.3.1 table 4
	Marker lights – luminous intensity			5.4.3.2
40	Tail lights – colour	4.2.7.1.3	EN 15153-1:2013 +A1:2016	5.4.4 table 6
	Tail lights – luminous intensity			5.5.3 table 7
41	Warning horn sound pressure levels	4.2.7.2.2	EN 15153-2:2013	5.5.4 table 8
42	Regenerative brake with energy to the overhead contact line	4.2.8.2.3	EN 50388:2012 and EN 50388:2012/AC:2013	5.2.2
				12.1.1

Index No	TSI		Normative document	
	Characteristics to be assessed	Point	Document No	Mandatory points
43	Maximum power and current from the overhead contact line – automatic regulation of current	4.2.8.2.4	EN 50388:2012 and EN 50388:2012/AC:2013	7.2
44	Power factor – verification method	4.2.8.2.6	EN 50388:2012 and EN 50388:2012/AC:2013	6
45	System energy disturbances for AC systems – harmonics and dynamic effects	4.2.8.2.7	EN 50388:2012 and EN 50388:2012/AC:2013	10.1
	System energy disturbances for AC systems – compatibility study			10.3 Table 5 Annex D 10.4
46	Working range in height of pantograph (IC level) – characteristics	4.2.8.2.9.1.2	EN 50206-1:2010	4.2, 6.2.3
47	Pantograph head geometry	4.2.8.2.9.2	EN 50367:2012 and EN 50367:2012/AC:2013	5.3.2.2
48	Pantograph head geometry – type 1 600 mm	4.2.8.2.9.2.1	EN 50367:2012 and EN 50367:2012/AC:2013	Annex A.2 Figure A.6
49	Pantograph head geometry – type 1 950 mm	4.2.8.2.9.2.2	EN 50367:2012 and EN 50367:2012/AC:2013	Annex A.2 Figure A.7
50	Pantograph current capacity (IC level)	4.2.8.2.9.3	EN 50206-1:2010	6.1.3.2
51	Pantograph lowering (RST level) – time to lower the pantograph	4.2.8.2.9.10	EN 50206-1:2010	4.7
	Pantograph lowering (RST level) – ADD			4.8
52	Pantograph lowering (RST level) – dynamic insulating distance	4.2.8.2.9.10	EN 50119:2009 and EN 50119:2009/A1:2013	Table 2
53	Electrical protection of the train – coordination of protection	4.2.8.2.10	EN 50388:2012 and EN 50388:2012/AC:2013	11
54	Protection against electrical hazard	4.2.8.4	EN 50153:2014	relevant cl. (!)
55	Windscreen – mechanical characteristics	4.2.9.2.1	EN 15152:2007	4.2.7, 4.2.9



Index No	TSI		Normative document	
	Characteristics to be assessed	Point	Document No	Mandatory points
56	Windscreen – angle between primary and secondary images	4.2.9.2.2	EN 15152:2007	4.2.2
	Windscreen – optical distortion			4.2.3
	Windscreen – haze			4.2.4
	Windscreen – luminous transmittance			4.2.5
	Windscreen – chromaticity			4.2.6
57	Recording device – functional requirements	4.2.9.6	EN/IEC 62625-1:2013	4.2.1, 4.2.2, 4.2.3, 4.2.4
	Recording device – recording performance			4.3.1.2.2
	Recording device – integrity			4.3.1.4
	Recording device – data integrity safeguard			4.3.1.5
	Recording device – level of protection			4.3.1.7
58	Measures to prevent fire – material requirements	4.2.10.2.1	EN 45545-2:2013 +A1:2015	relevant cl. (!)
59	Specific measures for flammable liquids	4.2.10.2.2	EN 45545-2:2013 +A1:2015	Table 5
60	Fire spreading protection measures for passenger rolling stock – partition test	4.2.10.3.4	EN 1363-1:2012	relevant cl. (!)
61	Fire spreading protection measures for passenger rolling stock – partition test	4.2.10.3.5	EN 1363-1:2012	relevant cl. (!)
62	Emergency lighting – lighting level	4.2.10.4.1	EN 13272:2012	5.3
63	Running capability	4.2.10.4.4	EN 50553:2012 and EN 50553:2012/AC:2013	relevant cl. (!)
64	Interface for water filling	4.2.11.5	EN 16362:2013	4.1.2 figure 1
65	Special requirements for stabling of trains – local external auxiliary power supply	4.2.11.6	EN/IEC 60309-2:1999 and amendments EN 60309-2:1999/A11:2004, A1:2007 and A2:2012	relevant cl. (!)
66	Automatic centre buffer coupler – type 10	5.3.1	EN 16019:2014	relevant cl. (!)

Index No	TSI		Normative document	
	Characteristics to be assessed	Point	Document No	Mandatory points
67	Manual end coupling – UIC type	5.3.2	EN 15551:2017	relevant cl. (!)
68	Manual end coupling – UIC type	5.3.2	EN 15566:2016	relevant cl. (!)
69	Rescue coupler	5.3.3	EN 15020:2006 +A1:2010	relevant cl. (!)
70	Main circuit breaker – coordination of protection	5.3.12	EN 50388:2012 and EN 50388:2012/AC:2013	11
71	Wheels – verification method decision criteria	6.1.3.1	EN 13979-1:2003 +A2:2011	7.2.1, 7.2.2 7.2.3
	Wheels – verification method Further verification method			7.3
	Wheels – verification method Thermomechanical behaviour			6
72	Wheel slide protection – method of verification	6.1.3.2	EN 15595:2009 +A1:2011	5
	Wheel slide protection – test programme			only 6.2.3 of 6.2
73	Head lamps – colour	6.1.3.3	EN 15153-1:2013 +A1:2016	6.3
	Head lamps – luminous intensity			6.4
74	Marker lamps – colour	6.1.3.4	EN 15153-1:2013 +A1:2016	6.3
	Marker lamps – luminous intensity			6.4
75	Tail lamps – colour	6.1.3.5	EN 15153-1:2013 +A1:2016	6.3
	Tail lamps – luminous intensity			6.4
76	Horn – sounding	6.1.3.6	EN 15153-2:2013	6
	Horn – sound pressure level			6
77	Pantograph – static contact force	6.1.3.7	EN 50367:2012 and EN 50367:2012/AC:2013	7.2
78	Pantograph – limit value	6.1.3.7	EN 50119:2009 and EN 50119:2009/A1:2013	5.1.2
79	Pantograph – verification method	6.1.3.7	EN 50206-1:2010	6.3.1

Index No	TSI		Normative document	
	Characteristics to be assessed	Point	Document No	Mandatory points
80	Pantograph – dynamic behaviour	6.1.3.7	EN 50318:2002	relevant cl. (!)
81	Pantograph – interaction characteristics	6.1.3.7	EN 50317:2012 and EN 50317:2012/AC:2012	relevant cl. (!)
82	Contact strips – verification method	6.1.3.8	EN 50405:2015	7.2, 7.3 7.4, 7.6 7.7
83	Safety against derailment running on twisted track	6.2.3.3	EN 14363:2016	4, 5, 6.1
84	Running dynamic behaviour – method of verification assessment of criteria conditions of assessment	6.2.3.4	EN 14363:2016	4, 5, 7
85	Equivalent conicity – rail section definitions	6.2.3.6	EN 13674-1:2011	relevant cl. (!)
86	Equivalent conicity – wheel profile definitions	6.2.3.6	EN 13715:2006 +A1:2010	relevant cl. (!)
87	Wheelset – assembly	6.2.3.7	EN 13260:2009 +A1:2010	3.2.1
88	Wheelset – axles, method of verification	6.2.3.7	EN 13103:2009 +A1:2010 +A2:2012	4, 5, 6
	Wheelset – axles, decision criteria			7
89	Wheelset – axles, method of verification	6.2.3.7	EN 13104:2009 +A1:2010	4, 5, 6
	Wheelset – axles, decision criteria			7
90	Axle boxes/bearings	6.2.3.7	EN 12082:2007 +A1:2010	6
91	Emergency braking performance	6.2.3.8	EN 14531-1:2005	5.11.3
92	Service braking performance	6.2.3.9	EN 14531-1:2005	5.11.3
93	Wheel slide protection, method of verification of performance	6.2.3.10	EN 15595:2009 +A1:2011	6.4
94	Slipstream effect – full scale tests	6.2.3.13	EN 14067-4:2013	6.2.2.1
	Slipstream effect – simplified assessment			4.2.4 and table 7

Index No	TSI		Normative document	
	Characteristics to be assessed	Point	Document No	Mandatory points
95	Head pressure pulse – method of verification	6.2.3.14	EN 14067-4:2013	6.1.2.1
	Head pressure pulse – CFD			6.1.2.4
	Head pressure pulse – moving model			6.1.2.2
	Head pressure pulse – simplified assessment method			4.1.4 and table 4
96	Maximum pressure variations — distance xp between the entrance portal and the measuring position, the definitions of $\Delta p_{Fr}$ , $\Delta p_N$ , $\Delta p_T$ , the minimum tunnel length	6.2.3.15	EN 14067-5:2006 +A1:2010	relevant cl. (!)
97	Horn – sound pressure level	6.2.3.17	EN 15153-2:2013 +A1:2016	5
98	Maximum power and current from the overhead contact line – method of verification	6.2.3.18	EN 50388:2012 and EN 50388:2012/AC:2013	15.3
99	Power factor — method of verification	6.2.3.19	EN 50388:2012 and EN 50388:2012/AC:2013	15.2
100	Current collection dynamic behaviour – dynamic tests	6.2.3.20	EN 50317:2012 and EN 50317:2012/AC:2012	relevant cl. (!)
101	Windscreen – characteristics	6.2.3.22	EN 15152:2007	6.2.1 to 6.2.7
102	Structural strength	Appendix C Section C.1	EN 12663-2:2010	5.2.1 to 5.2.4
103	NOT USED			
104	NOT USED			
105	NOT USED			
106	NOT USED			
107	Design values for new wheel profiles – evaluation of the equivalent conicity	6.2.3.6	EN 14363:2016	Annexes O and P
108	Slipstream effects – Requirements	4.2.6.2.1	EN 14067-4:2013	4.2.2.1, 4.2.2.2, 4.2.2.3 and 4.2.2.4
109	Head pressure pulse – Requirements	4.2.6.2.2	EN 14067-4:2013	4.1.2

Index No	TSI		Normative document	
	Characteristics to be assessed	Point	Document No	Mandatory points
110	End coupling – Compatibility between units –manual UIC type	4.2.2.2.3	EN 16839:2017	5, 6 7, 8
111	“Single pole” power supply line	4.2.11.6	CLC/TS 50534:2010	Annex A
112	Communication protocols	4.2.12.2	IEC 61375-1:2012	relevant cl. (1)
113	Gangways-Flange intercommunication connections	6.2.7a	EN 16286-1:2013	Annexes A and B
114	Physical interface between units for the signal transmission	6.2.7a	UIC 558, January 1996	Plate 2
115	Marking: length over buffers and electric power supply	6.2.7a	EN 15877-2:2013	4.5.5.1 4.5.6.3
116	On-board location function-Requirements	4.2.8.2.8.1	EN 50463-3:2017	4.4
117	Energy measurement function – accuracy for active energy measurement:	4.2.8.2.8.2	EN 50463-2:2017	4.2.3.1 and 4.2.3.4
	Energy measurement function – Class designations			4.3.3.4, 4.3.4.3 and 4.4.4.2
	Energy measurement function — Assessment	6.2.3.19b		5.4.3.4.1, 5.4.3.4.2, 5.4.4.3.1, Table 3, 5.4.3.4.3.1 and 5.4.4.3.2.1
118	Energy measurement function: consumption point identification — Definition	4.2.8.2.8.3	EN 50463-1:2017	4.2.5.2
119	Interface protocols between on-board energy measurement system (EMS) and on-ground data collection system (DCS) - Requirements	4.2.8.2.8.4	EN 50463-4:2017	4.3.3.1, 4.3.3.3, 4.3.4, 4.3.5, 4.3.6 and 4.3.7
120	Energy measurement function: mean temperature coefficient of each device — Assessment methodology	6.2.3.19b	EN 50463-2:2017	5.4.3.4.3.2 and 5.4.4.3.2.2
121	The compiling and handling of data within the data handing system-Assessment methodology	6.2.3.19b	EN 50463-3:2017	5.4.8.3, 5.4.8.5 and 5.4.8.6
122	On-board energy measurement system-Tests	6.2.3.19b	EN 50463-5:2017	5.3.3 and 5.5.4

(1) Clauses of the standard that are in direct relationship to the requirement expressed in the clause of the TSI indicated in column 3.

**J.2 Technical documents (available on ERA website)**

Index No	TSI		ERA technical document	
	Characteristics to be assessed	Point	Mandatory ref Document No	Points
1	Interface between control-command signalling trackside and other subsystems	4.2.3.3.1	ERA/ERTMS/033281 rev 4.0	3.1 & 3.2
2	Friction elements for wheel tread brake for freight wagons	7.1.4.2	ERA/TD/2013-02/INT v.3.0	All

## ANNEX V

The Annex to Regulation (EU) No 1303/2014 is amended as follows:

- (1) in Sections 1.1, 3, 4.1, 4.4 and 6.2.5 the references to 'Directive 2008/57/EC' are replaced by references to 'Directive (EU) 2016/797';
- (2) in section 1.1.1(a), 'European Union rail network' is replaced by 'network of the Union rail system';
- (3) in section 1.1.3.1 'European Union rail' is replaced by 'network of the Union rail';
- (4) section 1.1.4 is modified as follows:

1.1.4 Risk scope

1.1.4.1. Risks covered by this TSI

- (a) This TSI covers only specific risks to the safety of passengers and on-board staff in tunnels for the subsystems above.
- (b) Where a risk analysis comes to the conclusion that other tunnel incidents might be of relevance, specific measures to deal with these scenarios shall be defined.

1.1.4.2. Risks not covered by this TSI

- (a) Risks not covered by this TSI are as follows:

- (1) Health and safety of staff involved in maintenance of the fixed installations in tunnels.
- (2) Financial loss due to damage to structures and trains, and consequently the losses resulting from non-availability of the tunnel for repairs.
- (3) Trespass into the tunnel through the tunnel portals.
- (4) Terrorism, as a deliberate and premeditated act, which is designed to cause wanton destruction, injury and loss of life.
- (5) Risks for people in the neighbourhood of a tunnel where collapse of the structure could have catastrophic consequences.;

- (5) section 1.2 is replaced as follows:

**1.2 Geographical scope**

The geographical scope of this TSI is the network of the Union rail system as described in Annex I of Directive (EU) 2016/797 with the exclusion of the cases referred to in Articles 1(3) and 1(4) of Directive (EU) 2016/797;

- (6) 'fire fighting point(s)' is replaced by 'evacuation and rescue point(s)' in sections 1.1.1(b), 2.2.1(b), 2.4(c), 4.2.1.7, 4.2.3, 4.4.1(c), 4.4.2(a), 4.4.6;
- (7) in point (b) of Section 2.2.3, the text 'panic and to' is deleted;
- (8) in point (c) (1) of Section 2.3, the text 'inside the tunnel' is deleted;
- (9) point (f) of Section 2.3 is replaced as follows:

'(f) If the expectations of the emergency response services expressed in emergency plans go beyond the assumptions described above, the need for additional measures or tunnel equipment can be considered.;
- (10) in Section 2.4, a definition (b1) 'Final place of safety' is added as follows:

'(b1) Final place of safety: the final place of safety is the place where passengers and staff will no longer be impacted by the effects of the initial incident (e.g. smoke opacity and toxicity, temperature). It is the termination point of the evacuation.;

(11) point 2.4(c) is replaced as follows:

‘(c) Evacuation and rescue point: an evacuation and rescue point is a defined location, inside or outside the tunnel, where fire fighting equipment can be used by the emergency response services and where passengers and staff can evacuate from a train.’;

(12) a definition (g) ‘CSM on risk assessment’ is added as follows:

‘(g) CSM on risk assessment: this term is used to designate the Annex I of the Commission Implementing Regulation (EU) No 402/2013 of 30 April 2013 on the common safety method for risk evaluation and assessment and repealing Regulation (EC) No 352/2009 (OJ L 121, 3.5.2013, p. 8).’;

(13) section 3 is replaced as follows:

### ‘3. ESSENTIAL REQUIREMENTS

(a) The following table indicates basic parameters of this TSI and their correspondence to the essential requirements as set out and numbered in Annex III to Directive (EU) 2016/797.

(b) For meeting the essential requirements, the corresponding parameters of sections 4.2.1, 4.2.2 and 4.2.3 shall apply.

#### 3.1 Infrastructure and energy subsystems

(a) In order to meet the essential requirement “Safety” applying to the Infrastructure and Energy subsystems, the CSM on risk assessment may be applied as an alternative to the corresponding parameters of sections 4.2.1 and 4.2.2.

(b) Accordingly, for the risks identified in point 1.1.4 and the scenarios listed in point 2.2, the risk can be assessed by:

- (1) a comparison with a reference system;
- (2) an explicit risk estimation and evaluation.

(c) For meeting the essential requirements other than “Safety”, the corresponding parameters of sections 4.2.1 and 4.2.2 shall apply.

Element of the infrastructure sub-system	Ref. Clause	Safety	Reliability Availability	Health	Environmental protection	Technical compatibility	Accessibility
Prevent unauthorised access to emergency exits and technical rooms	4.2.1.1.	2.1.1					
Fire resistance of tunnel structures	4.2.1.2.	1.1.4 2.1.1					
Fire reaction of building material	4.2.1.3.	1.1.4 2.1.1		1.3.2	1.4.2		
Fire detection	4.2.1.4.	1.1.4 2.1.1					
Evacuation facilities	4.2.1.5.	1.1.5 2.1.1					
Escape walkways	4.2.1.6.	2.1.1					
Evacuation and rescue points	4.2.1.7 except (b)	2.1.1					
Evacuation and rescue points	4.2.1.7 (b)					1.5	



Element of the infrastructure sub-system	Ref. Clause	Safety	Reliability Availability	Health	Environmental protection	Technical compatibility	Accessibility
Emergency communication	4.2.1.8.	2.1.1					
Electricity supply for emergency response services	4.2.1.9	2.1.1					
Reliability of electrical systems	4.2.1.10	2.1.1					
Sectioning of contact line	4.2.2.1.	2.2.1					
Earthing of contact line	4.2.2.2.	2.2.1					

### 3.2 Rolling stock subsystem

(a) For meeting the essential requirements, the corresponding parameters of section 4.2.3 shall apply.

Element of the rolling stock sub-system	Ref. Clause	Safety	Reliability Availability	Health	Environmental protection	Technical compatibility	Accessibility
Measures to prevent fire	4.2.3.1	1.1.4 2.4.1		1.3.2	1.4.2		
Measures to detect and control fire	4.2.3.2	1.1.4 2.4.1					
Requirements related to emergencies	4.2.3.3	2.4.1	2.4.2			1.5 2.4.3	
Requirements related to evacuation	4.2.3.4	2.4.1'					

(14) in section 4.1, 'European Union rail system' is replaced by 'Union rail system';

(15) section 4.2.1.2(b) is deleted;

(16) section 4.2.1.3 is replaced as follows:

#### '4.2.1.3 Fire reaction of building material

This specification applies to all tunnels.

(a) This specification applies to construction products and building elements inside tunnels. These products shall fulfil the requirements of Commission Regulation (EU) 2016/364 (\*):

(1) Tunnel building material shall fulfil the requirements of classification A2.

(2) Non-structural panels and other equipment shall fulfil the requirements of classification B.

(3) Exposed cables shall have the characteristics of low flammability, low fire spread, low toxicity and low smoke density. These requirements are fulfilled when the cables fulfil at least the requirements of classification B2ca, s1a, a1.

If the classification is lower than B2ca, s1a, a1, the class of cables may be determined by the infrastructure manager after a risk assessment, taking into account the characteristics of the tunnel and the intended operational regime. For the avoidance of doubt, different classifications of cable may be used for different installations within the same tunnel provided that the requirements of this point are met.

- (b) Materials that would not contribute significantly to a fire load shall be listed. They are allowed to not comply with the above.

(\*) Commission Delegated Regulation (EU) 2016/364 of 1 July 2015 on the classification of the reaction to fire performance of construction products pursuant to Regulation (EU) No 305/2011 of the European Parliament and of the Council (OJ L 68, 15.3.2016, p. 4).;

- (17) section 4.2.1.4 is replaced as follows:

‘4.2.1.4. Fire detection in technical rooms

This specification applies to all tunnels of more than 1 km in length.

- (a) Fire in technical rooms shall be detected in order to alert the infrastructure manager.’;

- (18) section 4.2.1.5.2(b3) is deleted;

- (19) in section 4.2.1.5.4, the terms ‘on escape routes’ and ‘as low as possible,’ are deleted and point (c) is replaced as follows:

‘(c) Autonomy and reliability: an alternative electricity supply shall be available for an appropriate period of time after failure of the main supply. The time required shall be consistent with the evacuation scenarios and reported in the Emergency Plan.’;

- (20) in section 4.2.1.5.5, point (f), the term ‘cross-passage’ is replaced by ‘cross-passages’;

- (21) in section 4.2.1.6 point (a), the term ‘top’ is replaced by ‘bottom’;

- (22) section 4.2.1.7 is modified as follows:

(a) in point (a)(1) the terms ‘length of the train’ are replaced by the terms ‘length of the passenger train’;

(b) in point (a)(2) the terms ‘safe space’ are replaced by ‘open air area’ and the terms ‘along a safe space’ are deleted;

- (23) table in 4.2.1.7 is replaced as follows:

Rolling stock category according to paragraph 4.2.3	Maximum distance from the portals to an evacuation and rescue point and between evacuation and rescue points
Category A	5 km
Category B	20 km’

- (24) in point 4 of point (c) of section 4.2.1.7 is replaced as follows:

‘(4) It shall be possible to switch off and earth the contact line, either locally or remotely’;

- (25) a new section 4.2.1.9 is added with the following text:

‘4.2.1.9 Electricity supply for emergency response services

This specification applies to all tunnels of more than 1 km length.

The electricity supply system in the tunnel shall be suitable for the emergency response services equipment in accordance with the emergency plan for the tunnel. Some national emergency response services groups may be self-sufficient in relation to electricity supply. In this case, the option of not providing electricity supply facilities for the use of such groups may be appropriate. Such a decision, however, must be described in the emergency plan.’;

(26) a new section 4.2.1.10 is added with the following text:

‘4.2.1.10 Reliability of electrical systems

This specification applies to all tunnels of more than 1 km length.

- (a) Electrical systems identified by the Infrastructure Manager as vital to the safety of passengers in the tunnel shall be kept in use as long as necessary according to the evacuation scenarios considered in the emergency plan.
- (b) Autonomy and reliability: an alternative electricity supply shall be available for an appropriate period of time after failure of the main supply. The time required shall be consistent with the evacuation scenarios considered and included in the emergency plan.’;

(27) a new section 4.2.1.11 is added with the following text:

‘4.2.1.11. Communication and lighting at switching locations

This specification applies to all tunnels of more than 1 km in length.

- (a) When the contact line is divided into sections that can be locally switched, a means of communication and lighting shall be provided at the switching location.’;

(28) section 4.2.2.1 is replaced as follows:

‘4.2.2.1. Sectioning of contact line

This specification applies to all tunnels of more than 1 km length.

- (a) The traction power supply system in tunnels may be divided into sections.
- (b) In such case, it shall be possible to switch off each section of the contact line, either locally or remotely.’;

(29) in section 4.2.2.2, the term ‘Overhead line or conductor rail earthing’ is replaced by ‘Earthing of contact line’. The point c and the term ‘operations’ in point b are deleted;

(30) section 4.2.2.3 is deleted;

(31) section 4.2.2.4 is deleted;

(32) section 4.2.2.5. is deleted;

(33) in the table in section 4.3.1 the reference to clause ‘4.2.2.4(a)’ is replaced by a reference to clause ‘4.2.1.3’;

(34) in the table in section 4.3.2 the terms ‘specific elements for train crew and auxiliary staff’ and ‘4.6.3.2.3’ are deleted;

(35) in section 4.4, the terms ‘Article 18(3)’ are replaced by ‘Article 15(4)’ and ‘Annex VI’ is replaced by ‘Annex IV’;

(36) section 4.4.2 is replaced as follows:

‘4.4.2. Tunnel emergency plan

These rules apply to tunnels of more than 1 km in length

- (a) An emergency plan shall be developed under the direction of the Infrastructure Manager(s), in cooperation with the emergency response services and the relevant authorities for each tunnel. Station managers shall be equally involved if one or more stations are used as a safe area or an evacuation and rescue point. In case the emergency plan concerns an existing tunnel, Railway Undertakings already operating in the tunnel must be consulted. In case the emergency plan concerns a new tunnel, Railway Undertakings planning to operate in the tunnel may be consulted.
- (b) The emergency plan shall be consistent with the self-rescue, evacuation, fire-fighting and rescue facilities available.

- (c) Detailed tunnel-specific incident scenarios adapted to the local tunnel conditions shall be developed for the emergency plan.
- (d) Once developed, the emergency plan shall be communicated to Railway Undertakings intending to use the tunnel.;

(37) section 4.4.4. is modified as follows:

*‘4.4.4. Switching off and Earthing procedures*

These rules apply to all tunnels.

- (a) In the case it is required to switch off the traction power supply system the infrastructure manager shall make sure that relevant sections of the contact line have been switched off, and inform the emergency response services before they enter the tunnel or a section of the tunnel.
- (b) It is the responsibility of the infrastructure manager to switch off the traction power supply.
- (c) Procedures and responsibilities for earthing of the contact line shall be defined between the Infrastructure Manager and the emergency response services, and reported in the emergency plan. Provision shall be made for switching off the section in which the incident has taken place.;

(38) in Section 4.4.6.(a) the text ‘in the Register of Infrastructure defined in clause 4.8.1 and’ is deleted;

(39) in Section 4.4.6.(c) the text ‘panic and’ is deleted;

(40) section 4.8 is deleted;

(41) section 6.2.5(a) is modified as follows:

- (a) ‘Article 18(3)’ is replaced by ‘Article 15(4)’;
- (b) ‘a notified body’ is replaced by ‘the applicant’;

(42) Section 6.2.6 is replaced as follows:

*‘6.2.6. Assessment of conformity to the Safety requirements applying to the Infrastructure and Energy subsystems*

- (a) This clause applies when a comparison with a reference system or an explicit risk estimation is used to meet the essential requirement “Safety” applying to the Infrastructure and Energy subsystems.
- (b) In such case, the applicant shall:
  - (1) determine the risk acceptance principle, the methodology for the risk assessment, the safety requirements to be fulfilled by the system and the demonstration that they are fulfilled;
  - (2) determine the risk acceptance levels with the relevant national authority/authorities;
  - (3) designate the independent assessment body as defined in the CSM on risk assessment. This assessment body can be the notified body selected for the Infrastructure or Energy subsystem if recognised or accredited as per Section 7 of the CSM on risk assessment.
- (c) A safety assessment report shall be provided in compliance with the requirements defined in the CSM on risk assessment.
- (d) The EC certificate issued by the notified body shall explicitly mention the risk acceptance principle used for meeting the “Safety” requirement of this TSI. It shall also mention the methodology applied for the risk assessment and the risk acceptance levels.;

(43) section 6.2.7 is modified as follows:

in section 6.2.7.1., the complete text is replaced by ‘not used’;

section 6.2.7.2. (a)(2) is deleted;

in section 6.2.7.3. (a), the term ‘4.2.1.3 (c)’ is replaced by ‘4.2.1.3 (b)’;

section 6.2.7.4. (b) is deleted;

section 6.2.7.5. is replaced by the following text:

‘6.2.7.5. Emergency lighting in upgraded/renewed tunnels

In case of upgraded/renewed tunnels as required by clause 7.2.2.1, the assessment consists in the verification of the existence of the lighting. It is not necessary to apply detailed requirements.’;

in section 6.2.7.6, the term ‘installations’ is replaced by ‘systems’ and the reference to clause ‘4.2.2.5’ is replaced by a reference to clause ‘4.2.1.10.’;

(44) section 7(b) is modified as follows:

the text ‘suitable for safe integration in accordance with Section 15(1) of Directive 2008/57/EC with all non-TSI compliant tunnels within the geographical scope of this TSI.’ is replaced by ‘technically compatible with all non-TSI compliant tunnels within the geographical scope of this TSI in accordance with Article 21(3) of Directive (EU) 2016/797.’;

(45) section 7.1.1.(b) is modified as follows:

‘In the latter case Article 24 and 25 of Directive 2008/57/EC apply.’ is deleted;

(46) Section 7.2.2 is replaced as follows:

‘7.2.2. *Upgrade and renewal measures for tunnels*

In case of the upgrade or renewal of a tunnel, according to Article 15(7) and Annex IV of Directive (EU) 2016/797, the notified body issues certificates of verification for those parts of the subsystem composing the tunnel under the scope of the upgrade or renewal.

7.2.2.1. Upgrade or renewal of a tunnel

- (a) A tunnel is considered to be upgraded or renewed in the context of this TSI when any major modification or substitution work are carried out on a subsystem (or part of it) composing the tunnel.
- (b) Assemblies and components that are not included in the scope of a particular upgrade or renewal programme do not have to be made compliant at the time of such a programme.
- (c) When upgrading or renewal works are carried out, the following parameters apply if they are in the scope of work:
  - 4.2.1.1. Prevent unauthorised access to emergency exits and technical rooms
  - 4.2.1.3. Fire reaction of building material
  - 4.2.1.4. Fire detection in technical rooms
  - 4.2.1.5.4 Emergency lighting: where provided, it is not necessary to apply detailed requirements
  - 4.2.1.5.5 Escape signage
  - 4.2.1.8. Emergency communication.
- (d) The tunnel emergency plan shall be revised.

7.2.2.2. Extension of a tunnel

- (a) A tunnel is considered to be extended in the context of this TSI when its geometry is affected (e.g. extension in length, connection to another tunnel).
- (b) When a tunnel extension is carried out, then the following measures shall be implemented for assemblies and components included in the extension. For their application, the tunnel length to consider is the total tunnel length after extension:
  - 4.2.1.1. Prevent unauthorised access to emergency exits and technical rooms
  - 4.2.1.2. Fire resistance of tunnel structures
  - 4.2.1.3. Fire reaction of building material

- 4.2.1.4. Fire detection in technical rooms
- 4.2.1.5.4 Emergency lighting
- 4.2.1.5.5 Escape signage
- 4.2.1.6. Escape walkways
- 4.2.1.8. Emergency communication
- 4.2.1.9. Electricity supply for emergency response services
- 4.2.1.10. Reliability of electrical systems
- 4.2.1.11 Communication and lighting at switching locations
- 4.2.2.1. Sectioning of contact line
- 4.2.2.2. Earthing of contact line.

(c) The CSM on risk assessment shall be implemented as described in point 6.2.6 for defining the relevance of applying other measures of clause 4.2.1.5 and the measures of clause 4.2.1.7 to the complete tunnel resulting from the extension.

(d) When applicable, the tunnel emergency plan shall be revised.;

(47) section 7.3.1 is replaced by the following:

‘7.3.1. *General*

- (1) The specific cases, as listed in the following clause, describe special provisions that are needed and authorised on particular networks of each Member State.
- (2) These specific cases are classified as:
  - “P” cases: “permanent” cases.
  - “T0”: “temporary” cases of indefinite duration, where the target system shall be reached by a date still to be determined.
  - “T1” cases: “temporary” cases, where the target system shall be reached by 31 December 2025.
  - “T2” cases: “temporary” cases, where the target system shall be reached by 31 December 2035.

All specific cases and their relevant dates shall be re-examined in the course of future revisions of the TSI with a view to limiting their technical and geographical scope based on an assessment of their impact on safety, interoperability, cross border services, TEN-T corridors, and the practical and economic impacts of retaining or eliminating them. Special account shall be given to availability of EU funding.

Specific cases shall be limited to the route or network where they are strictly necessary and taken account of through route compatibility procedures.

- (3) Any specific case applicable to rolling stock within the scope of this TSI in detailed in the LOC&PAS TSI.

7.3.2. *Operational rules related to trains running in tunnels (clause 4.4.6)*

7.3.2.1 Specific case Italy (“T0”)

Additional prescriptions for rolling stock intended to be operated in non TSI compliant tunnels in Italy are detailed in the LOC&PAS TSI, clause 7.3.2.20.

7.3.2.2 Specific case Channel Tunnel (“P”)

Additional prescriptions for passenger rolling stock intended to be operated in the Channel Tunnel are detailed in the LOC&PAS TSI, clause 7.3.2.21’;

(48) The table in appendix B is replaced as follows:

'Characteristics to be assessed	Project phase		Particular assessment procedures
	Design review	Assembly before putting into service	
	1	2	3
4.2.1.1. Prevent unauthorised access to emergency exits and technical rooms	X	X	
4.2.1.2. Fire resistance of tunnel structures	X		6.2.7.2
4.2.1.3. Fire reaction of building material	X		6.2.7.3
4.2.1.4. Fire detection in technical rooms	X	X	
4.2.1.5. Evacuation facilities	X	X	6.2.7.4 6.2.7.5
4.2.1.6. Escape walkways	X	X	
4.2.1.7. Evacuation and rescue points	X	X	
4.2.1.8. Emergency communication	X		
4.2.1.9. Electricity supply for emergency response services	X		
4.2.1.10. Reliability of electrical systems	X		6.2.7.6
4.2.2.1. Sectioning of contact line	X	X	
4.2.2.2. Earthing of contact line	X	X'	

## ANNEX VI

The Annex to Regulation (EU) 2016/919 is amended as follows:

(1) Section 1.1 is amended as follows:

(a) in the second subparagraph, the text ‘Annex I points 1.2 and 2.2 of Directive 2008/57/EC’ is replaced by the text ‘Annex I point 2 of Directive (EU) 2016/797’;

(b) points (1) to (4) are replaced by the following:

‘(1) locomotives and passenger rolling stock, including thermal or electric traction units, self-propelling thermal or electric passenger trains, and passenger coach, if equipped with a driving cab.

(2) special vehicles, such as on-track machines, if equipped with a driving cab and intended to be used in transport mode on its own wheels.

This list of vehicles shall include those which are specially designed to operate on the different types of high-speed lines described in point 1.2. (Geographical scope).’;

(2) Section 1.2 is replaced by the following:

#### ‘1.2. Geographical Scope

The geographical scope of this TSI is the network of the whole rail system, as described in Annex I point 1 of Directive (EU) 2016/797 and excludes the infrastructure cases referred to in Articles 1(3) and 1(4) of Directive (EU) 2016/797.

The TSI shall apply to networks with 1 435 mm, 1 520 mm, 1 524 mm, 1 600 mm and 1 668 mm track gauges. However, it shall not apply to short border crossing lines with 1 520 mm track gauges that are connected to the network of third countries.’;

(3) Section 1.3 is amended as follows:

(a) the text ‘Article 5(3) of Directive 2008/57/EC’ is replaced by the text ‘Article 4(3) of Directive (EU) 2016/797’;

(b) points (8) and (9) are added after point (7) as follows:

‘(8) indicates the provisions applicable to the existing subsystems, in particular in the event of upgrading and renewal and, in such cases, the modification work which requires an application for a new authorisation for the vehicle or trackside subsystem — Chapter 7 (Implementing the Control-Command and Signalling Subsystems TSI);

(9) indicates the parameters of the subsystems to be checked by the railway undertaking and the procedures to be applied to check those parameters after the delivery of the vehicle authorisation for placing on the market and before the first use of the vehicle to ensure compatibility between vehicles and the routes on which they are to be operated — Chapter 4 (Characterisation of the Subsystems).’;

(c) the text ‘Article 5(5) of Directive 2008/57/EC’ is replaced by the text ‘Article 4(5) of Directive (EU) 2016/797’;

(4) The first paragraph of section 2.1 is replaced by the following:

‘The Control-Command and Signalling Subsystems are defined in Annex II of Directive (EU) 2016/797 as:

(a) Trackside control-command and signalling as: “all the trackside equipment required to ensure safety and to command and control movements of trains authorised to travel on the network.”

(b) On-board control-command and signalling as “all the on-board equipment required to ensure safety and to command and control movements of trains authorised to travel on the network”.’;



(5) Section 2.2 is amended as follows:

(a) The first paragraph is replaced by the following:

'The Control-Command and Signalling Subsystem TSI specifies only those requirements which are necessary to assure the interoperability of the Union rail system and the compliance with the essential requirements (\*).

(\*). Currently the CCS TSI does not specify any interoperability requirement for the interlockings, level crossings and certain other elements of the CCS.;

(b) the text 'Class B systems for the trans-European rail system network are a limited set of train protection limited set of train protection legacy systems that were in use in the trans-European rail network before 20 April 2001' is replaced by 'Class B systems for the trans-European rail system network are a limited set of train protection and voice radio legacy systems that were already in use in the trans-European rail network before 20 April 2001';

(c) the text 'Class B systems for other parts of the network of the rail system in the European Union are a limited set of train protection legacy systems that were in use in that networks before 1 July 2015' is replaced by 'Class B systems for other parts of the network of the rail system in the European Union are a limited set of train protection and voice radio legacy systems that were already in use in those networks before 1 July 2015';

(d) the text 'The list of Class B systems is established in the European Railway Agency technical documents "List of CCS Class B systems, ERA/TD/2011-11, version 3.0."' is replaced by 'The list of Class B systems is established in the European Union Agency for Railways technical document "List of CCS Class B systems, ERA/TD/2011-11, version 4.0."';

(e) the text 'All Control-Command and Signalling Subsystems, even where not specified in this TSI, shall be assessed according with Commission Implementing Regulation (EU) No 402/2013.' is added at the end of Section 2.2.

(6) Section 2.3 is replaced by the following:

### **2.3 Trackside Application Levels (ETCS)**

The interfaces specified by this TSI define the means of data transmission to, and (where appropriate) from trains. The ETCS specifications referenced by this TSI provide application levels from which a trackside implementation may choose the means of transmission that meet its requirements.

This TSI defines the requirements for all application levels.

For the technical definition of the ETCS application levels see Annex A, 4.1 c.;

(7) Section 3.1 is amended as follows:

(a) the text 'Directive 2008/57/EC' is replaced by the reference to 'Directive (EU) 2016/797';

(b) a new point (6) is added after point 5 as follows:

'(6) Accessibility.;

(8) Section 3.2.1 is replaced by the following:

#### **3.2.1 Safety**

Every Control-Command and Signalling Subsystems project shall take the measures necessary to ensure that the level of risk of an incident occurring within the scope of the Control-Command and Signalling Subsystems, is not higher than the objective for the service.

To ensure that the measures taken to achieve safety do not jeopardise interoperability, the requirements of the basic parameter defined in point 4.2.1 (Control-Command and Signalling reliability, availability and safety characteristics relevant to interoperability) shall be respected.

For the ETCS Class A system the safety objective is apportioned between the Control-Command and Signalling On-board and Trackside Subsystems. The detailed requirements are specified in the basic parameter defined in point 4.2.1 (Control-Command and Signalling reliability, availability and safety characteristics relevant to interoperability). This safety requirement shall be met together with the availability requirements as defined in Point 3.2.2 (Reliability and Availability).

For the ETCS Class A system:

- (a) the changes made by railway undertakings and infrastructure managers shall be managed in compliance with the processes and procedures of their safety management system;
- (b) the changes made by other actors (e.g. manufacturers or other suppliers) shall be managed according to the risk management process set out in Annex I to the Commission Implementing Regulation (EU) No 402/2013 (\*), as referred to in Article 6(1)(a) of Directive (EU) 2016/798 of the European Parliament and of the Council (\*\*).

Additionally the correct application of the risk management process as set out in Annex I of Regulation (EU) No 402/2013, as well as the appropriateness of the results from this application, shall be independently assessed by a CSM assessment body according to Article 6 of that Regulation. The CSM Assessment Body shall be accredited or recognised according to the requirements in Annex II of Regulation (EU) No 402/2013 in the fields of "Control-command and signalling" and "System safe integration" as listed in item 5 "classification" of ERADIS database entry for Assessment Bodies.

The application of the specifications as referred to in Annex A, Table A 3 is an appropriate means to fully comply to the risk management process as set out in Annex I of the Commission Implementing Regulation (EU) No 402/2013 for design, implementation, production, installation and validation (incl. Safety acceptance) of interoperability constituents and subsystems. When different specifications from the ones referred to in Annex A, Table 3 are applied, at least equivalence shall be demonstrated with the specifications in Annex A, Table 3.

Whenever the specifications as referred to in Annex A, Table A 3 are used as an appropriate means to fully comply to the risk management process as set out in Annex I of the Commission Implementing Regulation (EU) No 402/2013, in order to avoid unnecessary duplication of independent assessment work, the independent safety assessment activities that are required by the specifications referred to in Annex A, Table A 3 shall be carried out by an Assessment Body accredited or recognized as specified in the section above instead of a CENELEC independent safety assessor.

(\*) Commission Implementing Regulation (EU) No 402/2013 of 30 April 2013 on the common safety method for risk evaluation and assessment and repealing Regulation (EC) No 352/2009 (OJ L 121, 3.5.2013, p. 8).

(\*\*) Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety (OJ L 138, 26.5.2016, p. 102).;

- (9) The second paragraph of section 3.2.2 is replaced by the following:

'The level of risk caused by age and wear of constituents used within the subsystem shall be monitored. The requirements for maintenance stated in point 4.5 shall be respected.;

- (10) Section 3.2.5.2 is deleted;

- (11) A new section 3.2.6 is added as follows:

#### '3.2.6 Accessibility

No requirements are mandated for the CCS subsystems for the essential requirement accessibility.'

- (12) Section 4.1.1 is amended as follows:

- (a) in point (16) the text 'points 4.2.16' is replaced by 'point 4.2.16';

- (b) a new point (17) is added as follows:

'(17) ETCS and Radio System Compatibility (point 4.2.17);

- (13) In section 4.1.2 the text ‘limiting the movement of TSI-compliant on-board subsystems.’ is replaced by ‘limiting the movement of vehicles with TSI-compliant on-board subsystems.’;
- (14) Table 4.1 in section 4.1.3 is replaced by:

‘Table 4.1

Subsystem	Part	Basic parameters
Control-Command and Signalling On-board	Train protection	4.2.1, 4.2.2, 4.2.5, 4.2.6, 4.2.8, 4.2.9, 4.2.12, 4.2.14, 4.2.16, 4.2.17
	Voice radio communication	4.2.1.2, 4.2.4.1, 4.2.4.2, 4.2.5.1, 4.2.13, 4.2.16, 4.2.17
	Data radio communication	4.2.1.2, 4.2.4.1, 4.2.4.3, 4.2.5.1, 4.2.6.2, 4.2.16, 4.2.17
Control-Command and Signalling Trackside	Train protection	4.2.1, 4.2.3, 4.2.5, 4.2.7, 4.2.8, 4.2.9, 4.2.15, 4.2.16, 4.2.17
	Voice radio communication	4.2.1.2, 4.2.4, 4.2.5.1, 4.2.7, 4.2.16, 4.2.17
	Data radio communication	4.2.1.2, 4.2.4, 4.2.5.1, 4.2.7, 4.2.16, 4.2.17
	Train detection	4.2.10, 4.2.11, 4.2.16’

- (15) The title of section 4.2.1 is replaced by ‘Control-Command and Signalling reliability, availability and safety characteristics relevant to interoperability’;
- (16) Section 4.2.2 is replaced by the following:

‘4.2.2. On-board ETCS functionality

The basic parameter for ETCS on-board functionality describes all of the functions needed to run a train in a safe way. The primary function is to provide automatic train protection and cab signalling:

- (1) setting the train characteristics (e.g., maximum train speed, braking performance);
- (2) selecting the supervision mode on the basis of information from trackside;
- (3) performing odometry functions;
- (4) locating the train in a coordinate system based on Eurobalise locations;
- (5) calculating the dynamic speed profile for its mission on the basis of train characteristics and of information from trackside;
- (6) supervising the dynamic speed profile during the mission;
- (7) providing the intervention function.

These functions shall be implemented in accordance with Annex A 4.2.2 b and their performance shall conform to Annex A 4.2.2 a.

The requirements for tests are specified in Annex A 4.2.2 c.

The main functionality is supported by other functions, to which Annex A 4.2.2 a and Annex A 4.2.2 b also apply, together with the additional specifications indicated below:

- (1) Communication with the Control-Command and Signalling Trackside Subsystem.
  - (a) Eurobalise data transmission. See point 4.2.5.2 (Eurobalise communication with the train).

- (b) Euroloop data transmission. See point 4.2.5.3 (Euroloop communication with the train). This functionality is optional on-board unless Euroloop is installed trackside in ETCS Level 1 and the release speed is set to zero for safety reasons (e.g. protection of danger points).
  - (c) Radio data transmission for radio infill. See Annex A, 4.2.2 d, point 4.2.5.1 (Radio communications with the train), point 4.2.6.2 (Interface between GSM-R Radio Data Communication and ETCS) and point 4.2.8 (Key Management). This functionality is optional on-board unless radio data transmission for radio in-fill is installed trackside in ETCS Level 1 and the release speed is set to zero for safety reasons (e.g., protection of danger points).
  - (d) Radio data transmission. See point 4.2.5.1 (Radio communications with the train), point 4.2.6.2 (Interface between GSM-R Radio Data Communication and ETCS) and point 4.2.8 (Key Management). This radio data transmission is optional unless operating on an ETCS level 2 or level 3 lines.
- (2) Communicating with the driver. See Annex A, 4.2.2 e and point 4.2.12 (ETCS DMI).
- (3) Communicating with the STM. See point 4.2.6.1 (Interface between ETCS and STM). This function includes:
- (a) managing the STM output;
  - (b) providing data to be used by the STM;
  - (c) managing STM transitions.
- (4) Managing information about the completeness of the train (train integrity) — Supplying the train integrity to the on-board subsystem, is optional unless it is required by trackside.
- (5) Equipment health monitoring and degraded mode support. This function includes:
- (a) initialising the on-board ETCS functionality;
  - (b) providing degraded mode support;
  - (c) isolating the on-board ETCS functionality.
- (6) Support data recording for regulatory purposes. See point 4.2.14 (Interface to Data Recording for Regulatory Purposes).
- (7) Forwarding information/orders and receiving state information from rolling stock:
- (a) to the DMI. See point 4.2.12 (ETCS DMI)
  - (b) to/from the train interface unit. See Annex A, 4.2.2 f.;
- (17) Section 4.2.3 is replaced by the following:

#### ‘4.2.3. *Trackside ETCS functionality*

This Basic parameter describes the ETCS trackside functionality. It contains all ETCS functionality to provide a safe path to a specific train.

The main functionality is:

- (1) locating a specific train in a coordinate system based on Eurobalise locations (level 2 and level 3);
- (2) translating the information from trackside signalling equipment into a standard format for the Control-Command and Signalling On-board Subsystem;
- (3) sending movement authorities including track description and orders assigned to a specific train.

These functions shall be implemented in accordance with Annex A 4.2.3 b and their performance shall conform to Annex A 4.2.3 a.

The main functionality is supported by other functions, to which Annex A 4.2.3 a and Annex A 4.2.3 b also apply, together with the additional specifications indicated below:

- (1) communicating with the Control-Command and Signalling On-board Subsystem. This includes:
    - (a) Eurobalise data transmission. See point 4.2.5.2 (Eurobalise communication with the train) and point 4.2.7.4 (Eurobalise/Line-side Electronic Unit (LEU));
    - (b) Euroloop data transmission. See point 4.2.5.3 (Euroloop communication with the train) and point 4.2.7.5 (Euroloop/LEU). Euroloop is only relevant in level 1, in which it is optional;
    - (c) Radio data transmission for radio infill. See Annex A, 4.2.3 d, point 4.2.5.1 (Radio communications with the train), point 4.2.7.3 (GSM-R/trackside ETCS functionality) and point 4.2.8 (Key Management). Radio in-fill is only relevant in level 1, in which it is optional;
    - (d) Radio data transmission. See point 4.2.5.1 (Radio communications with the train), point 4.2.7.3 (GSM-R/trackside ETCS functionality) and point 4.2.8 (Key Management). Radio data transmission is only relevant to level 2 and level 3.
  - (2) generating information/orders to the on-board ETCS, e.g. information related to closing/opening the air flaps, lowering/raising the pantograph, opening/closing the main power switch, changing from traction system A to traction system B. Implementation of this functionality is optional for trackside; it can however be required by other applicable TSIs or national rules or the application of risk evaluation and assessment to ensure safe integration of subsystems;
  - (3) managing the transitions between areas supervised by different Radio Block Centres (RBCs) (only relevant for level 2 and level 3). See point 4.2.7.1 (Functional interface between RBCs) and point 4.2.7.2 (Technical interface between RBCs).;
- (18) In section 4.2.6.3 the reference to '4.2.6f' is deleted.
- (19) In section 4.2.11 the text 'Control-Command and Signalling equipment.' is replaced by 'Control-Command and Signalling train detection equipment.'
- (20) In section 4.2.16 the text 'by Control-command and signalling On-board Subsystems' is replaced by 'by Control-command and signalling On-board Interoperability Constituents and Subsystems';
- (21) A new section 4.2.17 is added as follows:

#### 4.2.17. *ETCS and Radio System Compatibility*

Due to the different possible implementations and the status of the migration to fully compliant CCS Subsystems, checks shall be performed in order to demonstrate the technical compatibility between the on-board and trackside CCS Subsystems. The necessity of these checks shall be considered as a measure to increase the confidence on the technical compatibility between the CCS subsystems. It is expected that these checks will be reduced until the principle stated in 6.1.2.1 is achieved.

##### 4.2.17.1. ETCS System Compatibility

ETCS System Compatibility (ESC) shall be the recording of technical compatibility between ETCS on-board and the trackside parts ETCS of the CCS subsystems within an area of use.

ESC type shall be the value assigned to record the technical compatibility between an ETCS on-board and a section within the area of use. All sections of the Union network which require the same set of checks for the demonstration of ESC shall have the same ESC type.

##### 4.2.17.2. Radio System Compatibility

Radio System Compatibility (RSC) shall be the recording of technical compatibility between voice or data radio on-board and the trackside parts of GSM-R of the CCS subsystems.

RSC type shall be the value assigned to record the technical compatibility between a voice or data radio and a section within the area of use. All sections of the Union network which require the same set of checks for the demonstration of RSC shall have the same RSC type.;

(22) Section 4.3 is amended as follows:

- (a) in the title of the tables, the text 'Clause' is replaced by 'Point';  
 (b) section 4.3.1 is replaced by the following:

*'4.3.1 Interface to the Operation and Traffic Management Subsystem*

Interface with Operation and Traffic Management TSI			
Reference CCS TSI		Reference Operation and Traffic Management TSI <sup>(1)</sup>	
Parameter	Point	Parameter	Point
Operating rules (normal and degraded conditions)	4.4	Rule book Operating rules	4.2.1.2.1 4.4
Visibility of trackside Control-Command and Signalling objects	4.2.15	Signal and line-side marker sighting	4.2.2.8
Train braking performance and characteristics	4.2.2	Braking performance	4.2.2.6
Use of sanding equipment On-board flange lubrication Use of composite brake blocks	4.2.10	Rule book	4.2.1.2.1
Interface to Data Recording for Regulatory Purposes	4.2.14	Data recording on-board	4.2.3.5
ETCS DMI	4.2.12	Train running number	4.2.3.2.1
GSM-R DMI	4.2.13	Train running number	4.2.3.2.1
Key Management	4.2.8	Ensuring that the train is in running order	4.2.2.7
Route compatibility checks before the use of authorised vehicles	4.9	Parameters for the vehicle and train compatibility over the route intended for operation	Appendix D1

<sup>(1)</sup> Commission Regulation (EU) 2015/995 of 8 June 2015 amending Decision 2012/757/EU concerning the technical specification for interoperability relating to the "operation and traffic management" subsystem of the rail system in the European Union (OJ L 165, 30.6.2015, p. 1).'

- (c) section 4.3.2 is replaced by the following:

*'4.3.2. Interface to the Rolling Stock Subsystem*

Interface with Rolling Stock TSIs				
Reference CCS TSI		Reference Rolling Stock TSIs		
Parameter	Point	Parameter		Point
Compatibility with trackside train detection systems: vehicle design	4.2.10	Rolling stock characteristics to be compatible with train detection systems based on track circuits	HS RS TSI <sup>(1)</sup> wheelset location	4.2.7.9.2
			axle load	4.2.3.2
			sanding	4.2.3.10
			electrical resistance between wheels	4.2.3.3.1
			CR RS TSI <sup>(2)</sup>	4.2.3.3.1.1
LOC & PAS TSI <sup>(3)</sup>	4.2.3.3.1.1			
Wagon TSI <sup>(4)</sup>	4.2.3.2			

Interface with Rolling Stock TSIs						
Reference CCS TSI		Reference Rolling Stock TSIs				
Parameter	Point	Parameter			Point	
		Rolling stock characteristics to be compatible with train detection systems based on axle counters	HS RS TSI	wheelset geometry	4.2.7.9.2	
				wheels	4.2.7.9.3	
			CR RS TSI			4.2.3.3.1.2
			LOC & PAS TSI			4.2.3.3.1.2
			Wagon TSI		4.2.3.3	
		Rolling stock characteristics to be compatible with loop equipment	HS RS TSI		None	
			CR RS TSI		4.2.3.3.1.3	
			LOC & PAS TSI		4.2.3.3.1.3	
			Wagon TSI		4.2.3.3	
Electromagnetic compatibility between rolling stock and Control-Command and Signalling trackside equipment	4.2.11	Rolling stock characteristics to be compatible with train detection systems based on track circuits	HS RS TSI		4.2.6.6.1	
			CR RS TSI		4.2.3.3.1.1	
			LOC & PAS TSI		4.2.3.3.1.1	
			Wagon TSI		4.2.3.3	
		Rolling stock characteristics to be compatible with train detection systems based on axle counters	HS RS TSI		4.2.6.6.1	
			CR RS TSI		4.2.3.3.1.2	
			LOC & PAS TSI		4.2.3.3.1.2	
			Wagon TSI		4.2.3.3	
Train braking performance and characteristics	4.2.2	Emergency braking performance	HS RS TSI	Emergency braking	4.2.4.1	
				Service braking	4.2.4.4	
			CR RS TSI	Emergency braking	4.2.4.5.2	
				Service braking	4.2.4.5.3	
			LOC & PAS TSI	Emergency braking	4.2.4.5.2	
				Service braking	4.2.4.5.3	
		Wagon TSI		4.2.4.1.2		
Position of Control-Command and Signalling on-board antennas	4.2.2	Kinematic gauge	HS RS TSI		4.2.3.1	
			CR RS TSI		4.2.3.1	
			LOC & PAS TSI		4.2.3.1	
			Wagon TSI		none	
Isolation of on-board ETCS functionality	4.2.2	Operating rules	HS RS TSI		4.2.7.9.1	
			CR RS TSI		4.2.12.3	
			LOC & PAS TSI		4.2.12.3	
			Wagon TSI		none	
Data interfaces	4.2.2	Monitoring and diagnostic concepts	HS RS TSI		4.2.7.10	
			CR RS TSI		4.2.1.1	
			LOC & PAS TSI		4.2.1.1	
			Wagon TSI		None	

Interface with Rolling Stock TSIs				
Reference CCS TSI		Reference Rolling Stock TSIs		
Parameter	Point	Parameter		Point
Visibility of trackside Control-Command and Signalling objects	4.2.15	External visibility Head lights	HS RS TSI	4.2.7.4.1.1
			CR RS TSI	4.2.7.1.1
LOC & PAS TSI	4.2.7.1.1			
Wagon TSI	None			
		Driver's external field of view	HS RS TSI	4.2.2.6 b
			line of sight	
			windscreen	4.2.2.7
			CR RS TSI	4.2.9.1.3.1
line of sight				
windscreen	4.2.9.2			
LOC & PAS TSI	4.2.9.1.3.1			
line of sight				
windscreen	4.2.9.2			
		Wagon TSI	None	
Interface to data recording for regulatory purposes	4.2.14	Recording device	HS RS TSI	4.2.7.10
			CR RS TSI	4.2.9.6
			LOC & PAS TSI	4.2.9.6
			Wagon TSI	none
Commands to rolling stock equipment	4.2.2	Phase separation	HS RS TSI	4.2.8.3.6.7
			CR RS TSI	4.2.8.2.9.8
	4.2.3		LOC & PAS TSI	4.2.8.2.9.8
	Wagon TSI		none	
Emergency braking command	4.2.2	Emergency braking command	HS RS TSI	none
			CR RS TSI	4.2.4.4.1
			LOC & PAS TSI	4.2.4.4.1
			Wagon TSI	none
Construction of equipment	4.2.16	Material requirements	HS RS TSI	4.2.7.2.2
			CR RS TSI	4.2.10.2.1
			LOC&PAS TSI	4.2.10.2.1
			Wagon TSI	none

(1) HS RS TSI is Commission Decision of 21 February 2008 concerning a technical specification for interoperability relating to the rolling stock sub-system of the trans-European high-speed rail system (2008/232/CE).

(2) CR RS TSI is Commission Decision of 26 April 2011 concerning a technical specification for interoperability relating to the rolling stock subsystem — Locomotives and passenger rolling stock of the trans-European conventional rail system (2011/291/EU).

(3) LOC & PAS TSI is Commission Regulation (EU) No 1302/2014 of 18 November 2014 concerning a technical specification for interoperability relating to the “rolling stock — locomotives and passenger rolling stock” subsystem of the rail system in the European Union.

(4) Wagon TSI is Commission Regulation (EU) No 321/2013 of 13 March 2013 concerning the technical specification for interoperability relating to the subsystem rolling stock — freight wagons of the rail system in the European Union and repealing Decision 2006/861/EC.’

(d) in section 4.3.4 the text ‘Phase separation points’ is replaced by ‘Phase separation sections’;

(23) In section 4.4 the text ‘Traffic Operation and Management TSI’ is replaced by ‘Operation and Traffic Management TSI’.



(24) In section 4.5.1 at the end of point (1) the following text is added 'For equipment error corrections see point 6.5.'

(25) Section 4.8 is replaced by:

#### **4.8 Registers**

The data to be provided for the registers provided for in Articles 48 and 49 of Directive (EU) 2016/797 are those indicated in Commission Implementing Decision 2011/665/EU (\*) and Commission Implementing Regulation (EU) 2019/777 (\*\*).

(\*) Commission Implementing Decision 2011/665/EU of 4 October 2011 on the European register of authorised types of railway vehicles (OJ L 264, 8.10.2011, p. 32).

(\*\*) Commission Implementing Regulation (EU) 2019/777 of 16 May 2019 on the common specifications for the register of railway infrastructure and repealing Implementing Decision 2014/880/EU (OJ L 139 I, 27.5.2019, p. 312).';

(26) A new section 4.9 is added below section 4.8 as follows:

#### **4.9. Route compatibility checks before the use of authorised vehicles**

The parameters of the on-board CCS subsystem to be used by the railway undertaking, for the purpose of route compatibility check, are described in Appendix D1 of Commission Implementing Regulation (EU) 2019/773 (\*).

(\*) Commission Implementing Regulation (EU) 2019/773 of 16 May 2019 on the technical specification for interoperability relating to the operation and traffic management subsystem of the rail system within the European Union and repealing Decision 2012/757/EU (OJ L 139 I, 27.5.2019, p. 5).';

(27) Section 5.1 is replaced by the following:

#### **5.1 Definition**

In accordance with Article 2(7) of Directive (EU) 2016/797, interoperability constituents means any elementary component, group of components, subassembly or complete assembly of equipment incorporated or intended to be incorporated into a subsystem, upon which the interoperability of the rail system depends directly or indirectly, including both tangible objects and intangible objects.;

(28) In section 5.2.2 a new paragraph is added at the end of the section as follows:

'Compliance of interfaces internal to the group of ICs to basic parameters of Chapter 4 does not have to be verified. Compliance of interfaces external to the group of ICs has to be verified to demonstrate conformity with the basic parameters related to the requirements of these external interfaces.;

(29) Section 5.3 is amended as follows:

(a) Table 5.1.a is replaced by:

*'Table 5.1.a*

#### **Basic interoperability constituents in the Control-Command and Signalling On-board Subsystem**

1	2	3	4
No	Interoperability constituent IC	Characteristics	Specific requirements to be assessed by reference to Chapter 4
1	ETCS on-board	Reliability, Availability, Maintainability, Safety (RAMS)	4.2.1 4.5.1
		On-board ETCS functionality (excluding odometry)	4.2.2

1	2	3	4
No	Interoperability constituent IC	Characteristics	Specific requirements to be assessed by reference to Chapter 4
		ETCS and GSM-R air gap interfaces — RBC (Radio data transmission optional) — Radio in-fill unit (functionality optional) — Eurobalise air gap — Euroloop air gap (functionality optional)	4.2.5 4.2.5.1 4.2.5.1 4.2.5.2 4.2.5.3
		Interfaces — STM (implementation of interface K optional) — GSM-R ETCS Data Only Radio — Odometry — Key management system — ETCS ID Management — ETCS Driver-Machine Interface — Train interface — On-board recording device	4.2.6.1 4.2.6.2 4.2.6.3 4.2.8 4.2.9 4.2.12 4.2.2 4.2.14
		Construction of equipment	4.2.16
2	Odometry equipment	Reliability, Availability, Maintainability, Safety (RAMS)	4.2.1 4.5.1
		On-board ETCS functionality: only Odometry	4.2.2
		Interfaces — On-board ETCS	4.2.6.3
		Construction of equipment	4.2.16
3	Interface of External STM	Interfaces — On-board ETCS	4.2.6.1
4	GSM-R voice cab radio Note: SIM card, antenna, connecting cables and filters are not part of this interoperability constituent	Reliability, Availability, Maintainability, (RAM)	4.2.1.2 4.5.1
		Basic communication functions	4.2.4.1
		Voice and operational communication applications	4.2.4.2
		Interfaces — GSM-R air gap — GSM-R Driver-Machine Interface	4.2.5.1 4.2.13
		Construction of equipment	4.2.16
5	GSM-R ETCS Data only Radio Note: SIM card, antenna, connecting cables and filters are not part of this interoperability constituent	Reliability, Availability, Maintainability (RAM)	4.2.1.2 4.5.1
		Basic communication functions	4.2.4.1
		ETCS data communication applications	4.2.4.3

1	2	3	4
No	Interoperability constituent IC	Characteristics	Specific requirements to be assessed by reference to Chapter 4
		Interfaces	
		— On-board ETCS	4.2.6.2
		— GSM-R air gap	4.2.5.1
		Construction of equipment	4.2.16
6	GSM-R SIM card	Basic communication functions	4.2.4.1
	Note: it is the responsibility of the GSM-R network operator to deliver to railway undertakings the SIM cards to be inserted in GSM-R terminal equipment	Construction of equipment	4.2.16'

(b) table 5.1.b is replaced by:

*'Table 5.1.b*

**Groups of interoperability constituents in the Control-Command and Signalling On-board Subsystem**

(This table is an example to show the structure. Other groups are allowed.)

1	2	3	4
No	Group of Interoperability constituents	Characteristics	Specific requirements to be assessed by reference to Chapter 4
1	ETCS on-board Odometry equipment	Reliability, Availability, Maintainability, Safety (RAMS)	4.2.1 4.5.1
		On-board ETCS functionality	4.2.2
		ETCS and GSM-R air gap interfaces	4.2.5
		— RBC (Radio data transmission optional)	4.2.5.1
		— Radio in-fill unit (functionality optional)	4.2.5.1
		— Eurobalise air gap	4.2.5.2
		— Euroloop air gap (functionality optional)	4.2.5.3
		Interfaces	
		— STM (implementation of interface K optional)	4.2.6.1
		— GSM-R ETCS Data Only Radio	4.2.6.2
		— Key management system	4.2.8
		— ETCS-ID Management	4.2.9
		— ETCS Driver Machine Interface	4.2.12
		— Train interface	4.2.2
		— On-board recording device	4.2.14
		Construction of equipment	4.2.16'

(c) table 5.2.a is replaced by:

*Table 5.2.a*

**Basic interoperability constituents in the Control-Command and Signalling Trackside Subsystem**

1	2	3	4
No	Interoperability constituent IC	Characteristics	Specific requirements to be assessed by reference to Chapter 4
1	RBC	Reliability, Availability, Maintainability, Safety (RAMS)	4.2.1 4.5.1
		Trackside ETCS functionality (excluding communication via Eurobalises, radio in-fill and Euroloop)	4.2.3
		ETCS and GSM-R air gap interfaces: only radio communication with train	4.2.5.1
		Interfaces — Neighbouring RBC — Data radio communication — Key management system — ETCS-ID Management	4.2.7.1, 4.2.7.2 4.2.7.3 4.2.8 4.2.9
		Construction of equipment	4.2.16
2	Radio in-fill unit	Reliability, Availability, Maintainability, Safety (RAMS)	4.2.1 4.5.1
		Trackside ETCS functionality (excluding communication via Eurobalises, Euroloop and level 2 and level 3 functionality)	4.2.3
		ETCS and GSM-R air gap interfaces: only radio communication with train	4.2.5.1
		Interfaces — Data radio communication — Key management system — ETCS-ID Management — Interlocking and LEU	4.2.7.3 4.2.8 4.2.9 4.2.3
		Construction of equipment	4.2.16
3	Eurobalise	Reliability, Availability, Maintainability, Safety (RAMS)	4.2.1 4.5.1
		ETCS and GSM-R air gap interfaces: only Eurobalise communication with train	4.2.5.2
		Interfaces — LEU — Eurobalise	4.2.7.4
		Construction of equipment	4.2.16

1	2	3	4
No	Interoperability constituent IC	Characteristics	Specific requirements to be assessed by reference to Chapter 4
4	Euroloop	Reliability, Availability, Maintainability, Safety (RAMS)	4.2.1 4.5.1
		ETCS and GSM-R air gap interfaces: only Euroloop communication with train	4.2.5.3
		Interfaces — LEU – Euroloop	4.2.7.5
		Construction of equipment	4.2.16
5	LEU Eurobalise	Reliability, Availability, Maintainability, Safety (RAMS)	4.2.1 4.5.1
		Trackside ETCS functionality (excluding communication via radio in-fill, Euroloop and level 2 and level 3 functionality)	4.2.3
		Interfaces — LEU — Eurobalise	4.2.7.4
		Construction of equipment	4.2.16
6	LEU Euroloop	Reliability, Availability, Maintainability, Safety (RAMS)	4.2.1 4.5.1
		Trackside ETCS functionality (excluding communication via radio in-fill, Eurobalise and level 2 and level 3 functionality)	4.2.3
		Interfaces — LEU – Euroloop	4.2.7.5
		Construction of equipment	4.2.16
7	Axle Counter	Trackside train detection systems (only parameters relevant for axle counters)	4.2.10
		Electromagnetic compatibility (only parameters relevant for axle counters)	4.2.11
		Construction of equipment	4.2.16'

(30) Section 6.1 is replaced by the following:

**6.1. Introduction**

6.1.1. *General principles*

6.1.1.1. Compliance with basic parameters

Fulfilment of the essential requirements set out in Chapter 3 of this TSI shall be ensured through compliance with the basic parameters specified in Chapter 4.

This compliance shall be demonstrated by:

- (1) assessing the conformity of the interoperability constituents specified in Chapter 5 (see point 6.2.1, 6.2.2, 6.2.3, 6.2.4);
- (2) verifying the subsystems (see point 6.3 and point 6.4).

### 6.1.1.2. Essential requirements fulfilled by National Rules

In certain cases, some of the essential requirements may be met by national rules, because of:

- (1) the use of Class B systems;
- (2) open points in the TSI;
- (3) non-application of TSIs (derogations) under Article 7 of Directive (EU) 2016/797;
- (4) specific cases described in point 7.6.

In such cases, assessment of conformity with those rules shall be carried out under the responsibility of the Member States concerned according to notified procedures. See point 6.4.2.

### 6.1.1.3. Partial fulfilment of TSI requirements

With regard to checking if essential requirements are fulfilled through compliance with the basic parameters, and without prejudice to the obligations set out in Chapter 7 of this TSI, control-command and signalling interoperability constituents and subsystems that do not implement all functions, performance and interfaces as specified in Chapter 4 (including the specifications referred to in Annex A), can obtain EC certificates of conformity or, respectively, certificates of verification, under the following conditions for issuing and using the certificates:

- (1) The applicant for EC verification of a trackside control-command and signalling subsystem is responsible for deciding which functions, performance and interfaces need to be implemented to meet the objectives for the service and to ensure that no requirements contradicting or exceeding the TSIs are exported to the on-board control-command and signalling subsystems.
- (2) The operation of an on-board control-command and signalling subsystem, that does not implement all functions, performance and interfaces specified in this TSI, may be subject to conditions and limits of use due to compatibility and/or safe integration with trackside control-command and signalling subsystems. Without prejudice to the tasks of a Notified Body described in respective Union legislation and related documents the applicant for EC verification is responsible for ensuring that the technical file provides all the information (\*) that an operator needs to identify such conditions and limits of use.
- (3) The authorising entity may refuse for duly justified reasons the authorisation for placing in service or on the market, or place conditions and limits of use on the operation, of control-command and signalling subsystems that do not implement all functions, performance and interfaces specified in this TSI.

If a control-command and signalling interoperability constituent or subsystem does not implement all functions, performance and interfaces specified in this TSI, the provisions of point 6.4.3 shall apply.

## 6.1.2. Principles for testing ETCS and GSM-R

### 6.1.2.1. Principle

The principle is that a Control-Command and Signalling On-board Subsystem covered by an "EC" declaration of verification is able to run on every Control-Command and Signalling Trackside Subsystem covered by an "EC" Declaration of verification, under the conditions specified in this TSI, with no additional verifications.

Achievement of this principle is facilitated by:

- (1) rules for the design and installation of the Control-Command and Signalling On-board and the Trackside subsystems;
- (2) test specifications to prove that the Control-Command and Signalling On-board and Trackside Subsystems comply with the requirements of this TSI and are mutually compatible.

#### 6.1.2.2. Operational test scenarios

For the purpose of this TSI, an “operational test scenario” means a sequence of trackside and on-board events related to or influencing the Control-command and Signalling subsystems (e.g. sending/receiving messages, exceeding a speed limit, actions of operators) and the specified timing between them in order to test the intended railway system operation in situations relevant for ETCS and GSM-R (e.g. entry of a train into an equipped area, awakening of a train, overriding a signal at stop).

The operational tests scenarios are based on the engineering rules adopted for the project.

Check of compliance of a real implementation with an operational tests scenario shall be possible gathering information through easily accessible interfaces (preferably the standard interfaces specified in this TSI).

#### 6.1.2.3. Requirements for Operational test scenarios

The set of engineering rules for the trackside parts of ETCS and GSM-R and related operational test scenarios for the Trackside Control-command and Signalling Subsystem shall be sufficient to describe all intended system operations relevant for the Trackside Control-command and Signalling Subsystem in normal and identified degraded situations, and:

- (1) shall be consistent with the specifications referenced in this TSI;
- (2) shall assume that functions, interfaces and performance of the Control-command and Signalling On-board Subsystems interacting with the Trackside Subsystem are compliant with the requirements of this TSI;
- (3) shall be the ones used in the EC Verification of the Trackside Control-command and Signalling Subsystem, to check that the implemented functions, interfaces and performance are able to ensure that the intended system operation in combination with the relevant modes and transitions between levels and modes of the Control-command and Signalling On-board Subsystems are respected.

#### 6.1.2.4. Requirements for ETCS System Compatibility

The Agency shall set up and manage in a technical document the set of checks to demonstrate the technical compatibility of an on-board subsystem with the trackside subsystem.

Infrastructure Managers, with the support of the ETCS suppliers for their network, shall submit to the Agency the definition of the necessary checks (as defined in 4.2.17) on their network by 16 January 2020 at the latest.

Infrastructure Managers shall classify the ETCS lines according to ESC types in RINF.

Infrastructure Managers shall submit to the Agency any changes on the referred checks for their network. The Agency shall update the technical document within 5 working days.

#### 6.1.2.5. Requirements for Radio System Compatibility

The Agency shall set up and manage in a technical document the set of checks to demonstrate the technical compatibility of an on-board subsystem with the trackside subsystem.

Infrastructure Managers, with the support of the GSM-R suppliers for their network, shall submit to the Agency the definition of the necessary checks (as defined in 4.2.17) on their network by 16 January 2020 at the latest.

Infrastructure Managers shall classify their lines according to RSC types for voice and, if applicable, ETCS data in RINF.

Infrastructure Managers shall submit to the Agency any changes on the referred checks for their network. The Agency shall update the technical document within 5 working days.

(\*) The template to be used to provide this information will be defined in the Application Guide.;

(31) Section 6.2 is amended as follows:

(a) in section 6.2.1, the text ‘Article 13(1) and Annex IV to Directive 2008/57/EC’ is replaced by the text ‘Article 10(1) and Article 9(2) of Directive (EU) 2016/797’;

(b) table 6.1 is replaced by the following:

‘Table 6.1

**Conformity assessment requirements of an interoperability constituent or a group of interoperability constituents**

No	Aspect	What to assess	Supporting evidence
1	Functions, interfaces and performances	Check that all mandatory functions, interfaces and performances as described in the basic parameters referenced in the relevant table of Chapter 5 are implemented and that they comply with the requirements of this TSI	Design documentation and running of test cases and test sequences, as described in the basic parameters referenced in the relevant table of Chapter 5
		Check which optional functions and interfaces as described in the basic parameters referenced in the relevant table of Chapter 5 are implemented and that they comply with the requirements of this TSI	Design documentation and running of test cases and test sequences, as described in the basic parameters referenced in the relevant table of Chapter 5
		Check which additional functions and interfaces (not specified in this TSI) are implemented and that they do not lead to conflicts with implemented functions specified in this TSI	Impact analysis
2	Construction of equipment	Check compliance with mandatory conditions, where specified in the basic parameters referenced in the relevant table of Chapter 5	Documentation on material used and, where necessary, tests to ensure that the requirements of the basic parameters referenced in the relevant table of Chapter 5 are satisfied
		In addition, check that the interoperability constituent functions correctly in the environmental conditions for which it is designed	Tests according to the applicant’s specifications
3	Reliability, Availability, Maintainability, Safety (RAMS)	<p>Check compliance with the safety requirements described in the basic parameters referenced in the relevant table of Chapter 5, i.e.</p> <ol style="list-style-type: none"> <li>1. respect for quantitative Tolerable Hazard Rates (THRs) caused by random failures</li> <li>2. the development process is able to detect and eliminate systematic failures</li> </ol>	<ol style="list-style-type: none"> <li>1. Calculations for the THRs caused by random failures, supported by reliability data.</li> <li>2.1. The manufacturer’s quality and safety management throughout design, manufacturing and testing conforms to a recognised standard (see note)</li> <li>2.2. The software development life-cycle, the hardware development life-cycle and the integration of hardware and software have each been undertaken in accordance with a recognised standard (see note)</li> </ol>



No	Aspect	What to assess	Supporting evidence
			<p>2.3. The safety verification and validation process has been undertaken in accordance with a recognised standard (see Note) and respects the safety requirements described in the basic parameters referenced in the relevant table of Chapter 5</p> <p>2.4. The functional and technical safety requirements (correct operation under fault-free conditions, effects of faults and of external influences) are verified in accordance with a recognised standard (see Note)</p> <p><i>Note:</i> The standard shall satisfy at least the following requirements:</p> <ol style="list-style-type: none"> <li>1. be compliant with the requirements for code of practice, as stated in Annex I, point 2.3.2, of Regulation (EU) No 402/2013</li> <li>2. be widely acknowledged in the railway domain. If this is not the case, the standard will have to be justified and be acceptable to the Notified Body;</li> <li>3. be relevant for the control of the considered hazards in the system under assessment;</li> <li>4. be publicly available for all actors who want to use it.</li> </ol>
4		Check that the quantitative reliability target (related to random failures) indicated by the applicant is met	Calculations
5		Elimination of systematic failures	<p>Tests of equipment (full Interoperability Constituent or separately for subassemblies) in operational conditions, with repair when defects are detected.</p> <p>Documentation accompanying the certificate which indicates which kind of verifications have been performed, which standards have been applied and criteria adopted to consider these tests completed (according to decisions of the applicant).</p>
6		Check compliance with maintenance requirements – point 4.5.1	Document check'

(c) in section 6.2.4.1 point (2) is replaced by the following:

'(2) these tests were carried out in a laboratory accredited in accordance with Regulation (EC) No 765/2008 of the European Parliament and of the Council (\*) and the standards referred to in Annex A, Table A 4 to carry out tests with the use of the test architecture and the procedures specified in Annex A 4.2.2.c.

(\*) Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance to the marketing of products and repealing Regulation (EEC) No 339/93 (OJ L 218, 13.8.2008, p. 30).'

(d) sections 6.2.5 and 6.2.6 are deleted;

(32) Section 6.3 is amended as follows:

(a) section 6.3.1 is replaced by the following:

**‘6.3.1. Assessment procedures for Control-Command and Signalling Subsystems**

This Chapter deals with the “EC” declaration of verification for the Control-Command and Signalling On-board Subsystem and the “EC” declaration of verification for the Control-Command and Signalling Trackside Subsystem.

At the request of the applicant the Notified Body shall carry out an “EC” verification of a Control-Command and Signalling On-board or Trackside Subsystem in accordance with Annex IV to Directive (EU) 2016/797.

The applicant shall draw up the “EC” declaration of verification for the Control-Command and Signalling On-board or Trackside Subsystem in accordance with Article 15(1) and Article 15(9) of Directive (EU) 2016/797.

The content of the “EC” declaration of verification shall conform to Article 15(9) of Directive (EU) 2016/797.

The assessment procedure shall be carried out using the modules specified in point 6.3.2 (Modules for Control-Command and Signalling Subsystems).

The “EC” declarations of verification for a Control-Command and Signalling On-board Subsystem and of a Control-Command and Signalling Trackside Subsystem, together with the certificates of conformity, shall be deemed sufficient to ensure that the subsystems are compatible under the conditions specified in this TSI.;

(b) section 6.3.2.3 is replaced by the following:

**‘6.3.2.3. Conditions for using modules for On-board and Trackside Subsystems**

With reference to point 4.2 of Module SB (type-examination), design review is requested.

With reference to point 4.2 of Module SH1 (full quality management system with design examination), an additional type test is required.;

(c) in section 6.3.3, Table 6.2 is replaced by the following:

*‘Table 6.2*

**Conformity assessment requirements for an On-board Subsystem**

No	Aspect	What to assess	Supporting evidence
1	Use of interoperability constituents	Check whether the interoperability constituents to be integrated into the subsystem are all covered by an “EC” Declaration of conformity and a corresponding certificate.  The Subsystem needs to be checked with a SIM card compliant with the requirements of this TSI. Changing the SIM card with another one compliant with the TSI is not a modification of the Subsystem.	Existence and content of documents
		Check conditions and limits of use on the use of Interoperability Constituents against the characteristics of the subsystem and of the environment	Analysis by document check
		For interoperability constituents that have been certified against a version of the CCS TSI, which is different from the version applied for the “EC” Verification of the subsystem and/or against a set of specifications which is different from the set of specifications applied for the “EC” Verification of the subsystem, check that the certificate still ensures subsystem compliance with the requirements of the TSI currently in force.	Impact analysis by document checks

No	Aspect	What to assess	Supporting evidence
2	Integration of interoperability constituents in the subsystem	Check the correct installation and functioning of the internal interfaces of the subsystem — Basic parameter 4.2.6	Checks according to specifications
		Check that additional functions (not specified in this TSI) do not impact the mandatory ones	Impact analysis
		Check that the values of ETCS IDs are within the allowed range and, if required by this TSI, have unique values – Basic parameter 4.2.9	Check of design specifications
3	Integration with rolling stock	Check the correct installation of equipment — Basic Parameters 4.2.2, 4.2.4, 4.2.14 and conditions for installation of equipment, as specified by the manufacturer	Results of checks (according to specifications referenced in the Basic Parameters and the manufacturer's installation rules)
		Check that the Control-Command and Signalling On-board Subsystem is compatible with the rolling stock environment – Basic parameter 4.2.16	Document check (certificates of interoperability constituents and possible integration methods checked against characteristics of rolling stock)
		Check that parameters (e.g., braking parameters) are correctly configured and that they are within the allowed range	Document check (values of parameters checked against characteristics of rolling stock)
4	Integration with Class B	Check that the external STM is connected to on-board ETCS with TSI-compliant interfaces	Nothing to test: there is a standard interface already tested at interoperability constituent level. Its functioning has already been tested when checking the integration of interoperability constituents in the subsystem
		Check that Class B functions implemented in the on-board ETCS– Basic parameter 4.2.6.1 — create no additional requirements for the Control-Command and Signalling Trackside Subsystem due to transitions	Nothing to test: everything has already been tested at interoperability constituent level
		Check that separate Class B equipment which is not connected to the on-board ETCS– Basic Parameter 4.2.6.1 — creates no additional requirements for Control-Command and Signalling Trackside Subsystem due to transitions	nothing to test: no interface (!)
		Check that separate Class B equipment connected on-board ETCS using (partly) non TSI compliant interfaces – basic parameter 4.2.6.1 — creates no additional requirements for the Control-Command and Signalling Trackside Subsystem due to transitions. Also check that ETCS functions are not affected	impact analysis
5	Integration with Control-Command and Signalling Trackside Subsystems	Check that Eurobalise telegrams can be read (scope of this test is limited to checking that the antenna has been appropriately installed. The tests already carried out at Interoperability Constituent level shall not be repeated) – Basic Parameter 4.2.5	Test using a certified Eurobalise: the ability to read correctly the telegram is the supporting evidence.

No	Aspect	What to assess	Supporting evidence
		Check that Euroloop telegrams (if applicable) can be read – Basic Parameter 4.2.5	Test using a certified Euroloop: the ability to read correctly the telegram is the supporting evidence.
		Check that the equipment can handle a GSM-R call for voice and data (if applicable) – Basic Parameter 4.2.5	Test with a certified GSM-R network. The ability to set up, maintain and disconnect a connection is the supporting evidence.
6	Reliability, Availability, Maintainability, Safety (RAMS)	Check that the equipment complies with safety requirements — Basic Parameter 4.2.1	Application of procedures specified in the Common Safety Method for Risk Evaluation and Assessment.
		Check that the quantitative reliability target is met — Basic Parameter 4.2.1	Calculations
		Check the compliance with requirements about maintenance – point 4.5.2	Documents check
7	Integration with Control-Command and Signalling Trackside Subsystems and other subsystems: tests under conditions representing the intended operation.	<p>Test the behaviour of the subsystem under as many different conditions as reasonably possible representing the intended operation (e.g line gradient, train speed, vibrations, traction power, weather conditions, design of Control-Command and Signalling trackside functionality). The test must be able to verify:</p> <ol style="list-style-type: none"> <li>1. that odometry functions are correctly performed — basic parameter 4.2.2</li> <li>2. that the on-board Control-Command and Signalling Subsystem is compatible with the rolling stock environment – basic parameter 4.2.16</li> </ol> <p>These tests must also be such as to increase confidence that there will be no systematic failures.</p> <p>The scope of these tests excludes tests already carried out at different stages: tests performed on the interoperability constituents and tests performed on the subsystem in a simulated environment shall be taken into account.</p> <p>Tests under environmental conditions are not necessary for on-board GSM-R voice equipment.</p> <p>Note: Indicate in the certificate which conditions have been tested and which standards have been applied.</p>	Reports of test runs.

(<sup>1</sup>) In this case, the assessment of the management of transitions shall be according to national specifications.'

(d) a new section 6.3.3.1 is added after table 6.2 as follows:

#### '6.3.3.1. ETCS and radio system compatibility checks

Particular attention shall be given to assessing the conformity of the on-board CCS subsystem regarding the Basic Parameter ETCS and radio system compatibility referred to in 4.2.17.

Regardless of the module selected for the previous EC verification procedure for the on-board subsystem, the Notified Body shall check:

- (a) the availability of the result of the technical compatibility checks for the selected area of use of the vehicle.
- (b) That the technical compatibility checks have been performed in accordance with the technical document published by the Agency, referred in points 6.1.2.4 and 6.1.2.5.
- (c) Based on the report of the checks, that the technical compatibility checks results indicate all the incompatibilities and errors encountered during the technical compatibility checks.

The Notified Body shall not check again any aspect covered during the already performed EC Verification procedure for the on-board subsystem.

The Notified Body performing these checks may be a different one from the Notified Body performing the EC Verification procedure for the on-board subsystem.

Performing these checks also at the level of Interoperability Constituent may reduce the amount of checks at the level of Control-command and Signalling Subsystem.;

- (e) in section 6.3.4, table 6.3 is replaced by the following:

*Table 6.3*

#### Conformity assessment requirements for a Trackside Subsystem

No	Aspect	What to assess	Supporting evidence
1	Use of interoperability constituents	Check that all interoperability constituents to be integrated into the subsystem are covered by an EC declaration of conformity and the corresponding certificate.	Existence and content of documents
		Check conditions and limits of use on the use of interoperability constituents against the characteristics of the subsystem and of the environment	Impact analysis by documents check
		For interoperability constituents that have been certified against a version of the Control-Command and Signalling TSI, which is different from the version applied for the "EC" Verification of the subsystem and/or against a set of specifications which is different from the set of specifications applied for the "EC" Verification of the subsystem, check that the certificate still ensures compliance with the requirements of the TSI currently in force	Impact analysis by comparison of specifications referenced in the TSI and certificates of the interoperability constituents
2	Integration of interoperability constituents in the subsystem	Check that the internal interfaces of the subsystem have been installed properly and function properly — Basic parameters 4.2.5, 4.2.7 and conditions specified by the manufacturer (N/A for IC axle counter)	Checks according to specifications
		Check that additional functions (not specified in this TSI) do not impact the mandatory ones	Impact analysis

No	Aspect	What to assess	Supporting evidence
		<p>Check that the values of ETCS IDs are within the allowed range and, if required by this TSI, have unique values – Basic Parameter 4.2.9</p> <p>(N/A for IC axle counter)</p>	Check of design specifications
		<p>For IC axle counters (only):</p> <p>The integration of the IC in the subsystem has to be verified:</p> <p>Check index 77 document points 3.1.2.1, 3.1.2.4 and 3.1.2.5 only.</p> <p>Check the correct installation of equipment and conditions specified by the manufacturer and/or the Infrastructure manager.</p>	Document check
3	Visibility of trackside Control-Command objects	Check that requirements for marker boards specified in this TSI are fulfilled (characteristics, compatibility with the infrastructure requirements (gauge, ...), compatibility with the driver's field of view) – Basic parameter 4.2.15	Design documentation, results of tests or test runs with TSI compliant rolling stock
4	Integration with infrastructure	Check that the equipment has been properly installed — Basic parameters 4.2.3, 4.2.4 and conditions for installation specified by the manufacturer	Results of checks (according to specifications referenced in the basic parameters and manufacturer's installation rules)
		Check that the Control-Command and Signalling Trackside subsystem equipment is compatible with the trackside environment – Basic parameter 4.2.16	Document check (certificates of interoperability constituents and possible methods of integration checked against trackside characteristics)
5	Integration with trackside signalling	Check that all functions required by the application are implemented in accordance with specifications referenced in this TSI — Basic parameter 4.2.3	Document check (applicant's design specification and certificates of interoperability constituents)
		Check the correct configuration of parameters (Eurobalise telegrams, RBC messages, marker boards positions, etc.)	Document check (values of parameters checked against characteristics of trackside and of signalling)
		Check that the interfaces are correctly installed and function properly.	Design verification and tests according to information supplied by the applicant
		Check that the Control-Command and Signalling Trackside subsystem operates correctly according to information at the interfaces with trackside signalling (e.g., appropriate generation of Eurobalise telegrams by a LEU or of message by RBC)	Design verification and tests according to the information supplied by the applicant

No	Aspect	What to assess	Supporting evidence
6	Integration with Control-Command and Signalling On-board Subsystems and with rolling stock	Check the GSM-R coverage — Basic Parameter 4.2.4	On site measurements
		Check that all functions required by the application are implemented in accordance with specifications referenced in this TSI — basic parameters 4.2.3, 4.2.4 and 4.2.5	Reports of the operational test scenarios specified in point 6.1.2 with at least two certified Control-Command and Signalling On-board Subsystems from different suppliers. The report shall indicate which operational test scenarios have been tested, which on-board equipment has been used and whether tests have been performed in laboratories, test lines or real implementation.
7	Compatibility of train detection systems (Excluding axle counters)	Check that the train detection systems comply with the requirements of this TSI — Basic parameters 4.2.10 and 4.2.11	Evidence of compatibility of equipment from existing installations (for systems already in use); perform tests according to standards for new types.
		Check the correct installation of equipment and conditions specified by the manufacturer and/or the Infrastructure manager.	On-site measurements to prove correctness of installation. Document check of correct installation of equipment.
8	Reliability, Availability, Maintainability, Safety (RAMS) (excluding train detection)	Check compliance with safety requirements — Basic Parameter 4.2.1.1	Application of procedures specified in the Common Safety Method for Risk Evaluation and Assessment
		Check that quantitative reliability targets are respected — Basic Parameter 4.2.1.2	Calculations
		Check the compliance with requirements about maintenance — point 4.5.2	Document check
9	Integration with Control-Command and Signalling On-board Subsystems and rolling stock: tests under conditions representing the intended operation.	<p>Test the behaviour of the subsystem under many different conditions as reasonably feasible representing the intended operation (e.g. train speed, number of trains on the line, weather conditions). The test must be able to verify:</p> <ol style="list-style-type: none"> <li>1. the performance of train detection systems — Basic parameters 4.2.10, 4.2.11,</li> <li>2. that the Control-Command and Signalling Trackside subsystem is compatible with trackside environment — Basic parameter 4.2.16</li> </ol> <p>These tests will also increase confidence in the absence of systematic failures.</p> <p>The scope of these tests excludes tests already done in different steps: tests performed at the level of interoperability constituents and tests performed on the subsystem in a simulated environment shall be taken into account.</p> <p>Note: Indicate in the certificate which conditions have been tested and which standards have been applied.</p>	Reports of test runs.

No	Aspect	What to assess	Supporting evidence
10	ETCS and radio System Compatibility	The necessary ESC and RSC check definition is made available to the Agency – Basic Parameter 4.2.17.	Technical compatibility checks for ESC and RSC published and maintained by the Agency.'

(33) Section 6.4 is replaced as follows:

(a) section 6.4.1 is replaced by the following:

*'6.4.1. Assessment of parts of control-command and signalling subsystems*

Pursuant to Article 15(7) of Directive (EU) 2016/797, the Notified Body may issue certificates of verification for certain parts of a subsystem, if allowed to do so under the relevant TSI.

As pointed out in point 2.2 (Scope) of this TSI, the trackside and on-board control-command and signalling subsystems contain parts, as specified in point 4.1 (Introduction).

A certificate of verification may be issued for each part or for a combination of parts specified in this TSI; the Notified Body only checks if that particular part fulfils the TSI requirements.

Regardless of which module is chosen, the Notified Body shall check that:

- (1) the TSI requirements for the part in question have been fulfilled; and
- (2) the fulfilment of the TSI requirements already assessed for other parts of the same subsystem has not been modified.;

(b) in section 6.4.2, the text 'certificate' is replaced by the text 'EC certificate';

(c) section 6.4.3.3 is replaced by the following:

*'6.4.3.3. Content of certificates*

In any event, notified bodies shall coordinate with the Agency the way in which conditions and restrictions of use of interoperability constituents and subsystems are managed in the relevant certificates and technical files in the working group set up under Article 24 of Regulation (EU) 2016/796 of the European Parliament and of the Council.;

(d) Section 6.4.4 is replaced by the following:

*'6.4.4. Intermediate Statement of Verification*

If conformity is assessed for parts of subsystems specified by the applicant and different from the parts allowed in Table 4.1 of this TSI, or if only certain stages of the verification procedure have been performed, only an intermediate statement of verification may be issued.;

(34) Section 6.5 is replaced by the following:

**'6.5. Management of errors**

Where deviations from intended functions and/or performance are detected during the tests or during the operational life of a subsystem, the applicants and/or operators shall inform without delay the Agency and the authorising entity that issued the authorisations for the concerned trackside subsystems or vehicles, to initiate the procedures set out in Article 16 of Directive (EU) 2016/797. As a result of the application of Article 16(3) of that Directive:

- (1) if the deviation is due to incorrect application of this TSI or to errors in design or installation of equipment, the applicant for the relevant certificates shall take the necessary corrective actions and the certificates affected and/or the corresponding technical files (for interoperability constituents and/or subsystems), together with the corresponding EC Declarations, shall be updated;



- (2) if the deviation is due to errors in this TSI or in specifications referenced therein, the procedure set out in Article 6 of the Directive (EU) 2016/797 shall be initiated.

The Agency shall organise an efficient processing of all the information received in order to facilitate the Change Control Management process for improvement/further development of the specifications, including the test specifications.;

(35) Section 7.2 is amended as follows:

- (a) two new sections 7.2.1a and 7.2.1b are added below section 7.2.1 as follows:

*7.2.1a Changes to an existing On-Board subsystem*

This point defines the principles to be applied by the entities managing the change and authorising entities in line with the EC verification procedure described in Article 15(9), Article 21(12) and Annex IV of Directive (EU) 2016/797. This procedure is further developed in Article 13, 15 and 16 of Commission Implementing Regulation (EU) 2018/545 <sup>(1)</sup> and in Commission Decision 2010/713/EU <sup>(2)</sup>.

This point applies in case of any change(s) to an existing on-board subsystem or on-board subsystem type, including renewal or upgrade. It does not apply in case of changes covered by Article 15(1)(a) of Implementing Regulation (EU) 2018/545.

**7.2.1a.1 Rules to manage changes in on-board CCS subsystems**

1. Parts, as defined in Table 4.1 of this TSI, and basic parameters of the on-board subsystem that are not affected by the change(s) are exempt from conformity assessment against the provisions in this TSI. The list of parts and basic parameters affected by the change is to be provided by the entity managing the change.
2. A new assessment against the requirements of the applicable TSI shall only be needed for the basic parameters which may be affected by the change(s).
3. The entity managing the change shall inform a Notified Body of all changes affecting the conformity of the subsystem with the requirements of the relevant TSI(s) requiring new checks, in accordance with Articles 15 and 16 of Implementing Regulation (EU) 2018/545 and Decision 2010/713/EU and by application of modules SB, SD/SF or SH1 for the EC verification, and if relevant Article 15(5) of Directive (EU) 2016/797. This information shall be provided by the entity managing the change with corresponding references to the technical documentation relating to the existing EC certificate.
4. The entity managing the change has to justify and document that applicable requirements remain consistent at subsystem level, and this has to be assessed by a Notified Body.
5. The changes impacting the Basic Design Characteristics of the on-board subsystem are defined in Table 7.1 Basic Design Characteristics and shall be classified as 15(1)(c) or 15(1)(d) of Implementing Regulation (EU) 2018/545, and in accordance with Table 7.1 Basic Design Characteristics changes not impacting but related to the Basic Design Characteristics shall be classified by the entity managing the change as 15(1)(b) of Implementing Regulation (EU) 2018/545.
6. Changes not covered by point 7.2.1a.1(5) above are deemed not to have any impact on the basic design characteristics. They will be classified by the entity managing the change as 15(1)(a) or 15(1)(b) of Implementing Regulation (EU) 2018/545.

*Note:* The classification of the changes set out in points 7.2.1a.1(5) and 7.2.1a.1(6) above is performed by the entity managing the change without prejudice of the safety judgement mandated in Article 21(12)(b) of Directive (EU) 2016/797.

7. All changes shall remain compliant with the applicable TSIs <sup>(3)</sup> regardless its classification.

Table 7.1

## Basic Design Characteristics

1. TSI Point	2. Related basic design characteristic(s)	3. Changes not impacting the basic design characteristics according to 15(1)(b) of Regulation (EU) 2018/545	4. Changes impacting the basic design characteristic but inside the acceptable range of parameters therefore to be classified as Art 15.1(c) of Regulation (EU) 2018/545	5. Changes impacting the basic design characteristic and outside the acceptable range of parameters therefore to be classified as Art 15.1(d) of Regulation (EU) 2018/545
4.2.2 On-board ETCS functionality	Set of specification of Annex A	Not Applicable	Not Applicable	Use another Annex A set of specifications
	On-board ETCS implementation	Fulfilling all the conditions in point 7.2.1a.2 (change of realisation)	Not Applicable	Not fulfilling all the conditions in point 7.2.1a.2 (Functional change)
	Managing information about the completeness of the train	Not applicable	Adding or removing train integrity supervision	Not applicable
4.2.17.1 ETCS System Compatibility	ETCS System Compatibility	Not applicable	Adding or removing ESC statements, after checking by a NoBo	Not applicable
4.2.4 Mobile communication functions for railways GSM-R 4.2.4.2 Voice and operational communication application	GSM-R Baseline	Use another Baseline fulfilling all the conditions in point 7.2.1a.3.	Not Applicable	Use another Baseline not fulfilling all the conditions in point 7.2.1a.3.
	Voice and operational communication implementation	Fulfilling all the conditions in point 7.2.1a.3 (change of realisation)	Not Applicable	Not fulfilling all the conditions in point 7.2.1a.3 (Functional change)
	SIM Card support of Group ID 555	Not applicable	Change the SIM Card support of Group ID 555	Not applicable
4.2.17.2 Radio System Compatibility	Radio Voice System Compatibility	Not applicable	Adding or removing RSC statements, after checking by a NoBo	Not applicable
4.2.4 Mobile communication functions for railways GSM-R 4.2.4.3 Data communication applications for ETCS	GSM-R Baseline	Use another Baseline fulfilling all the conditions in point 7.2.1a.3.	Not Applicable	Use another Baseline not fulfilling all the conditions in point 7.2.1a.3.
	Data communication for ETCS implementation	Fulfilling all the conditions in point 7.2.1a.3 (change of realisation)	Not Applicable	Not fulfilling all the conditions in point 7.2.1a.3 (Functional change)
4.2.17.2 Radio System Compatibility	Radio Data System Compatibility	Not applicable	Adding or removing RSC statements, after checking by a NoBo	Not applicable
4.2.4 Mobile communication functions for railways GSM-R 4.2.4.1 Basic communication function	SIM Card GSM-R Home Network	Not applicable	Replacement of a TSI compliant GSM-R SIM Card by another TSI compliant GSM-R SIM Card with a different GSM-R Home Network	Not applicable

1. TSI Point	2. Related basic design characteristic(s)	3. Changes not impacting the basic design characteristics according to 15(1)(b) of Regulation (EU) 2018/545	4. Changes impacting the basic design characteristic but inside the acceptable range of parameters therefore to be classified as Art 15.1(c) of Regulation (EU) 2018/545	5. Changes impacting the basic design characteristic and outside the acceptable range of parameters therefore to be classified as Art 15.1(d) of Regulation (EU) 2018/545
4.2.6.1 ETCS and Class B train protection	Class B train protection legacy system	The requirements for Class B system are the responsibility of the relevant Member State.	The requirements for Class B system are the responsibility of the relevant Member State.	Add or remove Class B train protection systems. The requirements for Class B system are the responsibility of the relevant Member State.
4.2.5.1 Radio communication with the train	Class B radio legacy system	The requirements for Class B system are the responsibility of the relevant Member State.	The requirements for Class B system are the responsibility of the relevant Member State.	Add or remove Class B radio legacy systems. The requirements for Class B system are the responsibility of the relevant Member State.

8. In order to establish the EC certificate, the Notified Body may refer to:

- The original EC certificate for parts of the design that are unchanged or those that are changed but do not affect the conformity of the subsystem, as far as it is still valid.
- Amendments to the original EC certificate for modified parts of the design that affect the conformity of the subsystem with the applicable TSI version used for the EC verification.

9. In any case, the entity managing the change shall ensure that the technical documentation which is relating to the EC certificate is updated accordingly.

10. The updated technical documentation, related to the EC certificate is referred to in the technical file accompanying the EC declaration of verification issued by the entity managing the change for on-board subsystem declared as conformant to the modified type.

11. The “system identifier” is as a numbering scheme to identify the system version of a CCS subsystem and distinguish between a functional and a realization identifier. The “functional identifier” is part of the system identifier and means a figure or a number of figures defined by the individual configuration management, which represents a reference of the basic design characteristics for CCS implemented in a CCS subsystem. The “Realization identifier” is part of the system identifier and means a figure or a number of figures defined by the individual configuration management of a supplier, which represents a specific configuration (e.g. HW and SW) of a CCS subsystem. The “system identifier”, “functional identifier” and “realization identifier” shall be defined by each supplier.

#### 7.2.1a.2 Conditions for a change in the On-board ETCS functionality that does not impact the basic design characteristics

1. The target functionality (\*) remains unchanged or is set to the state already expected during the original certification or authorisation.
2. The interfaces relevant for safety & technical compatibility remain unchanged or are set to the state already expected during the original certification or authorisation.
3. The result of the safety judgement (e.g. safety case according to EN 50126) remains unchanged.
4. No new safety related application conditions (SRAC) or interoperability constraints have been added due to the change.

5. An Assessment Body (CSM RA) as specified in point 3.2.1 has independently assessed the applicant's risk assessment and within it the demonstration that the change does not adversely affect safety. The applicant's demonstration shall include the evidence that the change actually corrects the causes of the initial deviation of the functionality.
6. The change is performed under a quality management system approved by a notified body (e.g. according to modules CH1, SH1, CD, SD). For other modules (e.g. CF, SF) it shall be justified that the verification performed remains valid <sup>(5)</sup>.
7. The individual configuration management defines a "system identifier" (as defined in 7.2.1a.1.11) and the functional part has not been changed after the change.
8. The change shall be part of the configuration management required by Article 5 of Regulation (EU) 2018/545.

#### 7.2.1a.3 Conditions for a change in the on-board mobile communication functions for railways that does not impact the basic design characteristics

1. The target functionality <sup>(6)</sup> remains unchanged or is set to the state already expected during the original certification or authorisation.
2. The interfaces relevant for technical compatibility remain unchanged or are set to the state already expected during the original certification or authorisation
3. The change is performed under a quality management system approved by a notified body (e.g. according to modules CH1, SH1, CD, SD). For other modules (e.g. CF, SF) it shall be justified that the verification performed remains valid <sup>(7)</sup>.
4. The change shall be part of the configuration management required by Article 5 of the Regulation (EU) 2018/545.

#### 7.2.1b Changes to an existing trackside subsystem

This point defines the principles to be applied by the entities managing the change and authorising entities in line with the EC verification procedure described in Article 15(9), Article 18(6) of Directive (EU) 2016/797 and in Decision 2010/713/EU.

##### 7.2.1b.1 Rules to manage changes in trackside CCS subsystems

In the event of upgrading or renewing the Control-Command and Signalling Subsystems bearing EC certificate of verification the following rules apply:

1. The changes require new authorisation if they impact basic parameters as defined in table 7.2.

Table 7.2

#### Trackside basic parameters modifications which requires a new authorisation

Basic Parameter		Modification which requires a new authorisation
4.2.3	Trackside ETCS functionality	Not fulfilling all the conditions in point 7.2.1b.2
4.2.4	Mobile communication functions for railways GSM-R	Not fulfilling all the conditions in point 7.2.1b.3
4.2.4.2	Voice and operational communication application	
4.2.4	Mobile communication functions for railways GSM-R	Not fulfilling all the conditions in point 7.2.1b.3
4.2.4.3	Data communication applications for ETCS	

2. The changes are permitted to be dealt with by only re-assessing those modifications that affect the conformity of the subsystem with the applicable TSIs version used for the EC verification. The entity managing the change has to justify and document that applicable requirements remain consistent at subsystem level, and this has to be assessed by a Notified Body.
3. The entity managing the change shall inform the Notified Body of all changes that may affect the conformity of the subsystem with the requirements of the relevant TSI(s) or the conditions for validity of the certificate.

This information shall be provided by the entity managing the change with corresponding references to the technical documentation relating to the existing EC certificate.

4. In order to establish the EC certificate, the Notified Body may refer to:
  - The original EC certificate for parts of the design that are unchanged or those that are changed but do not affect the conformity of the subsystem, as far as it is still valid.
  - Additional EC certificate (amending the original certificate) for modified parts of the design that affect the conformity of the subsystem with the applicable TSI version used for the EC verification.
5. In any case, the entity managing the change shall ensure that the technical documentation which is relating to the EC certificate is updated accordingly.
6. The “system identifier” is as a numbering scheme to identify the system version of a CCS subsystem and distinguish between a functional and a realization identifier. The “functional identifier” is part of the system identifier and means a figure or a number of figures defined by the individual configuration management, which represents a reference of the basic design characteristics for CCS implemented in a CCS subsystem. The “Realization identifier” is part of the system identifier and means a figure or a number of figures defined by the individual configuration management of a supplier, which represents a specific configuration (e.g. HW and SW) of a CCS subsystem. The “system identifier”, “functional identifier” and “realization identifier” shall be defined by each supplier.
7. “Configuration management” means a systematic organisational, technical and administrative process to ensure that the consistency of the documentation and the traceability of the changes are established and maintained so that:
  - (a) requirements from relevant Union law and national rules are met;
  - (b) changes are controlled and documented either in the technical files or in the file accompanying the issued authorisation;
  - (c) information and data is kept current and accurate;
  - (d) relevant parties are informed of changes, as required.

7.2.1b.2 Conditions for a change in the trackside ETCS functionality that, if not fulfilled, requires new authorisation for placing in service

1. The target functionality (\*) remains unchanged or is set to the state already expected during the original certification or authorisation.
2. The interfaces relevant for safety & technical compatibility remain unchanged or are set to the state already expected during the original certification or authorisation.
3. The result of the safety judgement (e.g. safety case according to EN 50126) remains unchanged.
4. No new safety related application conditions (SRAC) or interoperability constraints have been added due to the change.
5. When required in point 3.2.1, an Assessment Body (CSM RA) has independently assessed the applicant's risk assessment and within it the demonstration that the change does not adversely affect safety. The applicant's demonstration shall include the evidence that the change actually corrects the causes of the initial deviation of the functionality.

6. The change is performed under a quality management system approved by a notified body (e.g. according to modules CH1, SH1, CD, SD). For other modules (e.g. CF, SF, SG) it shall be justified that the verification performed remains valid <sup>(9)</sup>.
7. The individual configuration management defines a “system identifier” (as defined in 7.2.1b.1.6) and the functional part has not been changed after the change.
8. The change shall be part of the configuration management as defined in 7.2.1b.1.7.

#### 7.2.1b.3 Conditions for a change in the trackside mobile communication functions for railways that if not fulfilled requires a new authorisation for placing in service

1. The target functionality <sup>(10)</sup> remains unchanged or is set to the state already expected during the original certification or authorisation.
2. The interfaces relevant for technical compatibility remain unchanged or are set to the state already expected during the original certification or authorisation.
3. The change is performed under a quality management system approved by a notified body (e.g. according to modules CH1, SH1, CD, SD). For other modules (e.g. CF, SF, SG) it shall be justified that the verification performed remains valid <sup>(11)</sup>.
4. The change shall be part of the configuration management as defined in 7.2.1b.1.7.

#### 7.2.1b.4 Impact on the technical compatibility between on-board and trackside parts of the CCS subsystems

Infrastructure managers shall ensure that changes to an existing trackside subsystem allow the continuation of the operation of TSI compliant <sup>(12)</sup> on-board subsystems in operation on the lines concerned by the changes.

This requirement is not applicable when the changes are due to the implementation of a new level application trackside, by requirements defined in 7.2.6 (1) and (3), or of an incompatible application of the set of specifications referred to in Annex A to this TSI if the change is announced at least 3 years in advance unless a shorter period is agreed between the IM and the RU's who run services on these tracks <sup>(13)</sup>.

<sup>(1)</sup> Commission Implementing Regulation (EU) 2018/545 of 4 April 2018 establishing practical arrangements for the railway vehicle authorisation and railway vehicle type authorisation process pursuant to Directive (EU) 2016/797 of the European Parliament and of the Council (OJ L 90, 6.4.2018, p. 66).

<sup>(2)</sup> Commission Decision 2010/713/EU of 9 November 2010 on modules for the procedures for assessment of conformity, suitability for use and EC verification to be used in the technical specifications for interoperability adopted under Directive 2008/57/EC of the European Parliament and of the Council (OJ L 319, 4.12.2010, p. 1).

<sup>(3)</sup> According to Agency's Advice 2017/3 if there is no need for new authorisation the applicable TSI corresponds to the one used for the original certification. In case there is a need for new authorisation applicable TSI corresponds to the latest TSI.

<sup>(4)</sup> Target functionality refers to the ETCS functionality that has been evaluated in the subsystem EC certificate. The Technical Opinions published by the Agency that correct errors in the TSI are considered to define the functionality state already expected during the original certification or authorisation.

<sup>(5)</sup> All activities required for a modification which are performed outside a quality management system approved by a notified body might require additional examinations or tests by the notified body.

<sup>(6)</sup> Target functionality refers to the mobile communication functionality that has been evaluated in the subsystem EC certificate. The Technical Opinions published by the Agency that correct errors in the TSI are considered to define the functionality state already expected during the original certification or authorisation.

<sup>(7)</sup> All activities required for a modification which are performed outside a quality management system approved by a notified body might require additional examinations or tests by the notified body.

<sup>(8)</sup> Target functionality refers to the ETCS functionality that has been evaluated in the subsystem EC certificate. The Technical Opinions published by the Agency that correct errors in the TSI are considered to define the functionality state already expected during the original certification or authorisation.

- (<sup>9°</sup>) All activities required for a modification which are performed outside a quality management system approved by a notified body might require additional examinations or tests by the notified body.
- (<sup>10°</sup>) Target functionality refers to the ETCS functionality that has been evaluated in the subsystem EC certificate. The Technical Opinions published by the Agency that correct errors in the TSI are considered to define the functionality state already expected during the original certification or authorisation.
- (<sup>11°</sup>) All activities required for a modification which are performed outside a quality management system approved by a notified body might require additional examinations or tests by the notified body.
- (<sup>12°</sup>) On-board subsystems with conditions and restrictions of use or non-detected deficiencies are not considered compliant regarding this clause.
- (<sup>13°</sup>) An upgrade of tracks operated in mixed traffic to ETCS level 3 shall only be done if passenger and freight trains retain access to these tracks.'

(b) in section 7.2.3, the text 'Article 29(1) of Directive 2008/57/EC' is replaced by 'Article 51(1) of Directive (EU) 2016/797';

(c) section 7.2.6 is replaced by the following:

*'7.2.6. Conditions for mandatory and optional functions*

The applicant for EC verification of a Control-command and Signalling Trackside subsystem shall check whether Control-command and Signalling Trackside functions, which are defined "optional" in this TSI, are required by other TSIs or national rules or by the application of risk evaluation and assessment to ensure safe integration of subsystems.

The trackside implementation of national or optional functions shall not prevent the use of that infrastructure by a train that complies only with the mandatory requirements of the On-board Class A system except as required for the following on-board optional functions:

- (1) An ETCS Level 3 Trackside application requires that the on-board is able to confirm the train integrity;
- (2) An ETCS Level 1 Trackside application with infill requires that the on-board is equipped with the corresponding in-fill data transmission (Euroloop or radio) if the release speed is set to zero for safety reasons (e.g. protection of danger points).
- (3) When ETCS needs data transmission by radio, the data radio communication part as specified in this TSI is required.

An on-board subsystem, which incorporates a KER STM, may make it necessary to implement the K-interface.;

(36) Section 7.3.2 is amended as follows:

- (a) the text 'point' is replaced by 'section';
- (b) the text 'already in service' is replaced by 'already on the market';

(37) Section 7.4.1 is replaced by:

*'7.4.1 Trackside installations*

Articles 1, 2 and Annex I to Commission Implementing Regulation (EU) 2017/6 (\*) of 5 January 2017 on the European Rail Traffic Management System European deployment plan shall apply as referred to in Article 47 of Regulation (EU) No 1315/2013 (\*\*).

Trackside shall not install and operate the Euroloop and radio infill data transmission, except on already existing installations or planned projects that use those data transmission. Such planned projects shall be notified to the European Commission by 30 June 2020.

**7.4.1.1 High-speed network**

It is mandatory to fit ETCS trackside when:

1. installing for the first time the train protection part of a Control-Command and Signalling Trackside Subsystem (with or without a Class B system); or

2. upgrading the existing train protection part of a Control-Command and Signalling Trackside Subsystem, where this would change the functions, performance and/or interoperability-relevant interfaces (air gaps) of the existing legacy system. This does not apply to modifications deemed necessary to mitigate safety-related defects in the legacy installation.

(\*) Commission Implementing Regulation (EU) 2017/6 of 5 January 2017 on the European Rail Traffic Management System European deployment plan (OJ L 3, 6.1.2017, p. 6).

(\*\*) Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU (OJ L 348, 20.12.2013, p. 1).;

(38) Section 7.4.2.1 is amended as follows:

#### ‘7.4.2.1 New vehicles

1. In order to be placed on the market in accordance with Article 21 of Directive (EU) 2016/797, new vehicles, including vehicles authorised in conformity to a type shall be equipped with ETCS in accordance with Annex A of this TSI and shall comply with set of specifications #2 or #3 referred to in Table A 2 of Annex A (\*).
2. The requirement to be equipped with ETCS does not apply to:
  - (1) new mobile railway infrastructure construction and maintenance equipment;
  - (2) new shunting locomotives;
  - (3) other new vehicles not intended for operating on high-speed lines;
    - (a) if they are intended exclusively for national service operated outside the corridors defined in point Annex I of Implementing Regulation (EU) 2017/6 and outside the lines ensuring the connections to the main European ports, marshalling yards, freight terminals and freight transport areas defined in Article 2(1) of Implementing Regulation (EU) 2017/6; or
    - (b) if they are intended for off-TEN cross-border service, i.e., service until the first station in the neighbouring country or to the first station where there are connections further in the neighbouring country utilising only lines outside of the TEN.
3. All vehicle type authorisations granted based on conformity to set of specifications #1 referred to in Table A 2 of Annex A of this TSI shall not remain valid for authorising new vehicles in conformity to those vehicle types (without prejudice to the application of 7.4.2.3). All vehicles already authorised according to those vehicle types are not affected.

(\*) Or placed into service in accordance with Directive 2008/57/EC, if Directive (EU) 2016/797 is not yet applicable.’;

(39) New section 7.4.2.3 is added as follows:

#### ‘7.4.2.3 Application of the TSI requirements for new vehicles during a transition phase

1. Some projects or contracts, which started before the date of application of this TSI, may lead to apply for an authorisation to put on the market (\*) of new vehicles equipped with ETCS complying with specification #1 referred to in Table A 2.1 of Annex A of this TSI, and which do not fully comply with Section 7.4.2.1 of this TSI. For vehicles concerned by those projects or contracts, and in accordance with point (f) of Article 4(3) of Directive (EU) 2016/797, a transition phase is defined, during which the application of Section 7.4.2.1 of this TSI is not mandatory.
2. This transition phase applies to new vehicles authorised in conformity to a vehicle type (\*\*) authorised before 1 January 2019 in any Member State on the basis of conformity to set of specifications #1 referred to in Table A 2 of Annex A of this TSI up to December 31 2020.
3. The transition phase is:
  - (a) up to December 31 2020: In order to be placed on the market (\*) in accordance with Article 21 of Directive 2016/797/EC, those new vehicles referred under 2 shall be equipped with ETCS in accordance with set of specifications #1, #2 or #3 referred to in Table A 2 of Annex A of this TSI.



- (b) If set of specification #1 is used, a condition for use shall be included in their authorisation to put on the market (\*) enforcing compliance with set specifications #2 or #3 within a period of time not exceeding 1 July 2023.

(\*) Or placed into service in accordance with Directive 2008/57/EC, if Directive (EU) 2016/797 is not yet applicable.

(\*\*) Variants or versions of a vehicle type are considered to be authorised in conformity to an existing authorised type. Where the regime of Directive 2008/57/EC applies, changes which would give rise to variants or versions of a vehicle type under Implementing Regulation (EU) 2018/545 are also considered to be based upon an existing authorised type.;

(40) In section 7.4.3, the text 'placing in service' is replaced by 'placing on the market';

(41) Section 7.4.4 is amended as follows:

(a) In the first paragraph the text 'those lines with ETCS and decommissioning of class B systems' is replaced by 'those lines with ETCS and Class A Radio and decommissioning of class B systems';

(b) In point (1) the text 'General and context description, including facts and figures on existing train protection systems, such as capacity, safety, reliability performance, remaining economic lifetime of the installed equipment and cost benefit analysis of ETCS implementation.' is replaced by 'General and context description, including:

(1) facts and figures on existing train protection systems, such as capacity, safety, reliability performance;

(2) remaining economic lifetime of the installed equipment and cost benefit analysis of ETCS and Class A Radio implementation;

(3) national requirements relevant for Baseline 3 on-board units;

(4) information on communication systems between on-board units and track side installations (e.g. radio circuit switching or packet switching, in-fill options for ETCS; Class B communication systems);

(c) In point (4)(i) the text 'The dates of ETCS deployment' is replaced by 'The dates of ETCS and Class A Radio deployment';

(d) In point (4)(iii) the text 'or other parts of the network.' is replaced by 'or other parts of the network, including service facilities';

(e) In the third paragraph the text 'at least every five years.' is replaced by 'at least every five years. The update of the national implementation plans shall take into account the introduction of the next generation communication system(s), including but not limited to the date of start of operation and, when applicable, the date of decommissioning of GSM-R on (parts of) the Network.';

(f) the text 'Article 29(1) of Directive 2008/57/EC' is replaced by 'Article 51(1) of Directive (EU) 2016/797';

(42) A new section 7.4a is added below section 7.4.4 as follows:

#### **7.4a ETCS and radio system compatibility checks implementation rules**

Existing vehicles shall be deemed compatible with the ETCS and radio system compatibility types of the networks on which they are operating by 16 January 2020 without any further checks, maintaining the existing restrictions or conditions for use.

Any subsequent modification of the vehicle or the infrastructure regarding the technical or route compatibility shall be managed according to the requirements specified for ETCS and Radio system compatibility.;

(43) In section 7.5 the fourth paragraph is replaced by the following:

'Implementing a train detection system that is compliant with the requirements of this TSI can be done independently of the installation of ETCS or GSM-R.';

(44) In section 7.6.1, the text 'points below should be read' is replaced by 'points below shall be read';

(45) In section 7.6.1, a new paragraph is added at the end as follows:

'All specific cases and their relevant dates shall be re-examined in the course of future revisions of the TSI with a view to limiting their technical and geographical scope based on an assessment of their impact on safety, interoperability, cross border services, TEN-T corridors, and the practical and economic impacts of retaining or eliminating them. Special account shall be given to availability of EU funding.

Specific cases shall be limited to the route or network where they are strictly necessary and taken account of through route compatibility procedures.'

(46) Section 7.6.2.1 is amended as follows:

- (a) the text 'the vehicle should have' is replaced by 'the vehicle shall have';
- (b) the text 'Index 77, point 3.1.2.4' is replaced by 'Index 77, point 3.1.2.3';
- (c) the text 'Index 77, point 3.1.8' is replaced by 'Index 77, point 3.1.7';

(47) Section 7.6.2.2 is amended as follows:

- (a) the text 'Index 77, point 3.1.2.4' is replaced by 'Index 77, point 3.1.2.3';

(48) In the last two rows in the third column of the table, the text 'set of specifications 2' is replaced by 'set of specifications 2 or 3';

(49) Section 7.6.2.3 is amended as follows:

- (a) the text 'Index 77, point 3.1.2.4' is replaced by 'Index 77, point 3.1.2.3';
- (b) the text 'Index 77, point 3.1.8' is replaced by 'Index 77, point 3.1.7';
- (c) in the first row in the second column of the table; the text 'T3' is replaced by 'P';
- (d) in the first row in the third column of the table, the text 'This Specific Case is linked with the use of TVM' is replaced by 'This Specific Case is linked with the use of track circuits using electrical joints';
- (e) in the third row of the first column of the table, the text 'the vehicle should have' is replaced by 'the vehicle shall have';
- (f) a new row is added at the end of the table as follows:

'4.2.10 Trackside Train Detection Systems Index 77, point 3.1.4.1. In addition to the TSI requirements, the allowed maximum amount of sand per unit and per rail within 30 s is: 750 g	P	This specific case is linked to the use of track circuits with a higher sensitivity regarding the isolation layer between wheels and rails due to sanding on the French Network'
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(50) Section 7.6.2.6 is replaced by the following:

'7.6.2.6. Sweden

Specific case	Category	Notes
4.2.4 Mobile communication functions for railways – GSM-R Index 33, statement 4.2.3: It is permissible to put on the market on-board Control-Command and Signalling Subsystems including 2 Watt GSM-R voice cab radios and ETCS data only radios. The subsystems shall be able to operate in networks with – 82 dBm.	P	No impact on interoperability
4.2.10 — Trackside Train Detection Systems Index 77, point 3.1.2.1: Maximum axle distance between two axles $\leq 17,5$ m (ai in Fig. 1, point 3.1.2.1).	P	

Specific case	Category	Notes
<p>4.2.10 — Trackside Train Detection Systems Index 77, point 3.1.2.3: Minimum axle distance between first and last axle <math>\geq</math> 4,5 m (L-b1-b2 in Fig. 1, point 3.1.2.3).</p>	P	
<p>4.2.10 — Trackside Train Detection Systems Index 77, point 3.2.2.5: Frequency range: 0,0-2,0 Hz Interference current limit [rms value]: 25,0 A Evaluation method: Low-Pass filter Evaluation parameters: (Down sampling to 1 kHz, followed by) 2,0 Hz 4th order Butterworth low-pass filter, followed by an ideal rectifier to give the absolute value. The maximum interference current for a rail vehicle must not exceed 25,0 A in the frequency range 0,0-2,0 Hz. Inrush current may exceed 45,0 A for less than 1,5 seconds and 25 A for less than 2,5 seconds.</p>	P'	

(51) In section 7.6.2.7 the text 'Index 77, point 3.1.2.4' is replaced by 'Index 77, point 3.1.4.1'

(52) In section 7.6.2.8 a new row is added at the end of the table as follows:

<p>'4.2.10 Trackside Train Detection Systems Index 77, point 3.2.2.5: Frequency range: 93 - 110 Hz Interference current limit [rms value]: 2.8 A (for influencing unit) 2 A (for one traction unit) Evaluation method: Band Pass Filters Evaluation parameters: — BP filter characteristics: Centre frequencies: 95, 96, 98, 100, 104, 106 and 108 Hz 3dB-Bandwidth: 4 Hz Butterworth, 6th order — RMS calculation: Integration time: 0,5 s Time overlap: 50 %</p>	T3	<p>This specific case is needed because these track circuits may be modified by shifting the centre frequency from 100 Hz to 106,7 Hz. This would make obsolete a vehicle related National Technical Rule requiring a 100 Hz monitoring system.'</p>
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(53) A new section 7.6.2.9 is added after 7.6.2.8 as follows:

‘7.6.2.9 Italy

Specific case	Category	Notes
4.2.10 — Trackside Train Detection Systems Index 77, point 3.2.2.4 and point 3.2.2.6: Frequency range: 82 - 86 Hz Interference current limit [rms value]: 1 125 A Evaluation method: Fast Fourier Transformation Evaluation parameters: Time window 1s, Hanning window, 50 % overlap, average on 6 consecutive windows	P'	

(54) A new section 7.6.2.10 is added after 7.6.2.9 as follows:

‘7.6.2.10 Czech Republic

Specific case	Category	Notes
4.2.10 — Trackside Train Detection Systems Index 77, point 3.2.2.4 and point 3.2.2.6: Frequency range: 70,5 – 79,5 Hz Interference current limit [rms value]: 1 A Evaluation method: Band Pass Filters Evaluation parameters: — BP filter characteristics: Centre frequencies: 73, 75, 77 Hz (continuous band) 3dB-Bandwidth: 5 Hz Butterworth, order 2*4 — RMS calculation: Integration time: 0,5 s Time overlap: min 75 % Frequency range: 271,5 – 278,5 Hz Interference current limit [rms value]: 0,5 A Evaluation method: Band Pass Filters Evaluation parameters: — BP filter characteristics: Centre frequencies: 274, 276 Hz (continuous band) 3dB-Bandwidth: 5 Hz Butterworth, order 2*4 — RMS calculation: Integration time: 0,5 s Time overlap: min 75 %	T3	This specific case is needed as long as track circuits type EFCP are used.’

(55) A new section 7.6.2.11 is added after 7.6.2.10 as follows:

‘7.6.2.11 The Netherlands

Specific case	Category	Notes
4.2.10 — Trackside Train Detection Systems Index 77, point 3.2.2.6: Frequency range: 65-85 Hz (ATBEG limit) Interference current limit [rms value]: 0,5 A Evaluation method: Band Pass Filters Evaluation parameters: — BP filter characteristics Centre frequency: 75 Hz 3dB-Bandwidth: 20 Hz 20dB-Bandwidth: 40 Hz — RMS calculation Integration time: 5 s Time overlap: 80 % Transient shorter than 1s only exceeding the ATBEG limit and not the GRS limit may be ignored. Frequency range: 65-85 Hz (GRS TC limit) Interference current limit [rms value]: 1,7 A Evaluation method: Band Pass Filters Evaluation parameters: — BP filter characteristics Centre frequency: 75 Hz 3dB-Bandwidth: 20 Hz 20dB-Bandwidth: 40 Hz — RMS calculation Integration time: 1,8 s Time overlap: 80 %	T3	This Specific Cases is needed in the context of the Class-B system ATBEG.’

(56) Annex A is replaced by the following:

‘ANNEX A

## References

For each reference made in the basic parameters (Chapter 4 of this TSI) the following table indicates the corresponding mandatory specifications, via the Index in Table A 2 (Table A 2.1, Table A 2.2, Table A 2.3).

Table A 1

Reference in Chapter 4	Index number (see Table A 2)
<b>4.1</b>	
4.1 a	Intentionally deleted

Reference in Chapter 4	Index number (see Table A 2)
4.1 b	Intentionally deleted
4.1 c	3
<b>4.2.1</b>	
4.2.1 a	27, 78
<b>4.2.2</b>	
4.2.2 a	14
4.2.2 b	1, 4, 13, 15, 60
4.2.2 c	31, 37b, c, d
4.2.2 d	18, 20
4.2.2 e	6
4.2.2 f	7, 81, 82
<b>4.2.3</b>	
4.2.3 a	14
4.2.3 b	1, 4, 13, 15, 60
4.2.3 c	Intentionally deleted
4.2.3 d	18, 21
<b>4.2.4</b>	
4.2.4 a	64, 65
4.2.4 b	66
4.2.4 c	67
4.2.4 d	68
4.2.4 e	73, 74
4.2.4 f	32, 33
4.2.4 g	48
4.2.4 h	69, 70
4.2.4 j	71, 72
4.2.4 k	75, 76

Reference in Chapter 4	Index number (see Table A 2)
<b>4.2.5</b>	
4.2.5 a	64, 65
4.2.5 b	10, 39, 40
4.2.5 c	19, 20
4.2.5 d	9, 43
4.2.5 e	16, 50
<b>4.2.6</b>	
4.2.6 a	8, 25, 26, 36 c, 49, 52
4.2.6 b	29, 45
4.2.6 c	46
4.2.6 d	34
4.2.6 e	20
4.2.6 f	Intentionally deleted
<b>4.2.7</b>	
4.2.7 a	12
4.2.7 b	62, 63
4.2.7 c	34
4.2.7 d	9
4.2.7 e	16
<b>4.2.8</b>	
4.2.8 a	11, 79, 83
<b>4.2.9</b>	
4.2.9 a	23
<b>4.2.10</b>	
4.2.10 a	77 (point 3.1)
<b>4.2.11</b>	
4.2.11 a	77 (point 3.2)

Reference in Chapter 4	Index number (see Table A 2)
<b>4.2.12</b>	
4.2.12 a	6, 51
<b>4.2.13</b>	
4.2.13 a	32, 33, 51, 80
<b>4.2.14</b>	
4.2.14 a	5
<b>4.2.15</b>	
4.2.15 a	38

### Specifications

One of the three tables in Table A 2 (Table A 2.1, Table A 2.2, Table A 2.3) of this Annex shall be applied for the trackside subsystem. For the on-board subsystem either Table A 2.2 or Table A 2.3 shall be applied, after the transition period defined in 7.4.2.3.

When a document listed in Table A 2 incorporates, by copying or by reference to, a clearly identified point of another document, this point, and only this, shall be considered a part of the document listed in Table A 2.

For the purposes of this TSI, when a document listed in Table A 2 makes a “mandatory” or “normative” reference to a document not listed in Table A 2, the referenced document shall always be understood as an acceptable means of compliance with basic parameters (that can be used for certification of Interoperability Constituents and Subsystems and not requiring future revisions of the TSI) and not as a mandatory specification.

Note: specifications indicated as “Reserved” in Table A 2 are also listed as open points in Annex G when there is a need for notification of national rules to close the corresponding open points. Reserved documents not listed as open points are intended as improvements to the system.

Table A 2.1

### List of mandatory specifications

Index No	Set of specifications # 1 (only for trackside Subsystems. For on-board subsystems not to be applied after the transition period defined in 7.4.2.3) (ETCS Baseline 2 and GSM-R Baseline 1)			
	Reference	Name of Specification	Version	Notes
1	ERA/ERTMS/003204	ERTMS/ETCS Functional requirement specification	5.0	
2	Intentionally deleted			
3	SUBSET-023	Glossary of Terms and Abbreviations	2.0.0	
4	SUBSET-026	System Requirements Specification	2.3.0	
5	SUBSET-027	FFFIS Juridical recorder-downloading tool	2.3.0	Note 1



Index No	Set of specifications # 1 (only for trackside Subsystems. For on-board subsystems not to be applied after the transition period defined in 7.4.2.3) (ETCS Baseline 2 and GSM-R Baseline 1)			
	Reference	Name of Specification	Version	Notes
6	SUBSET-033	FIS for man-machine interface	2.0.0	
7	SUBSET-034	FIS for the train interface	2.0.0	
8	SUBSET-035	Specific Transmission Module FFFIS	2.1.1	
9	SUBSET-036	FFFIS for Eurobalise	2.4.1	
10	SUBSET-037	EuroRadio FIS	2.3.0	
11	SUBSET-038	Offline key management FIS	2.3.0	
12	SUBSET-039	FIS for the RBC/RBC handover	2.3.0	
13	SUBSET-040	Dimensioning and Engineering rules	2.3.0	
14	SUBSET-041	Performance Requirements for Interoperability	2.1.0	
15	SUBSET-108	Interoperability related consolidation on TSI Annex A documents	1.2.0	
16	SUBSET-044	FFFIS for Euroloop	2.3.0	
17	Intentionally deleted			
18	SUBSET-046	Radio infill FFFS	2.0.0	
19	SUBSET-047	Trackside-Trainborne FIS for Radio infill	2.0.0	
20	SUBSET-048	Trainborne FFFIS for Radio infill	2.0.0	
21	SUBSET-049	Radio infill FIS with LEU/interlocking	2.0.0	
22	Intentionally deleted			
23	SUBSET-054	Responsibilities and rules for the assignment of values to ETCS variables	2.1.0	
24	Intentionally deleted			
25	SUBSET-056	STM FFFIS Safe time layer	2.2.0	
26	SUBSET-057	STM FFFIS Safe link layer	2.2.0	
27	SUBSET-091	Safety Requirements for the Technical Interoperability of ETCS in Levels 1 and 2	2.5.0	
28	Intentionally deleted			
29	SUBSET-102	Test specification for interface "K"	1.0.0	
30	Intentionally deleted			
31	SUBSET-094	Functional requirements for an onboard reference test facility	2.0.2	
32	EIRENE FRS	GSM-R Functional requirements specification	8.0.0	Note 10

Index No	Set of specifications # 1 (only for trackside Subsystems. For on-board subsystems not to be applied after the transition period defined in 7.4.2.3) (ETCS Baseline 2 and GSM-R Baseline 1)			
	Reference	Name of Specification	Version	Notes
33	EIRENE SRS	GSM-R System requirements specification	16.0.0	Note 10
34	A11T6001	(MORANE) Radio Transmission FFFIS for EuroRadio	13.0.0	
35	Intentionally deleted			
36 a	Intentionally deleted			
36 b	Intentionally deleted			
36 c	SUBSET-074-2	FFFIS STM Test cases document	1.0.0	
37 a	Intentionally deleted			
37 b	SUBSET-076-5-2	Test cases related to features	2.3.3	
37 c	SUBSET-076-6-3	Test sequences	2.3.3	
37 d	SUBSET-076-7	Scope of the test specifications	1.0.2	
37 e	Intentionally deleted			
38	06E068	ETCS Marker-board definition	2.0	
39	SUBSET-092-1	ERTMS EuroRadio Conformance Requirements	2.3.0	
40	SUBSET-092-2	ERTMS EuroRadio test cases safety layer	2.3.0	
41	Intentionally deleted			
42	Intentionally deleted			
43	SUBSET 085	Test specification for Eurobalise FFFIS	2.2.2	
44	Intentionally deleted			
45	SUBSET-101	Interface "K" Specification	1.0.0	
46	SUBSET-100	Interface "G" Specification	1.0.1	
47	Intentionally deleted			
48	Reserved	Test specification for mobile equipment GSM-R		Note 4
49	SUBSET-059	Performance requirements for STM	2.1.1	
50	SUBSET-103	Test specification for Euroloop	1.0.0	
51	Reserved	Ergonomic aspects of the DMI		
52	SUBSET-058	FFFIS STM Application layer	2.1.1	
53	Intentionally deleted			
54	Intentionally deleted			

Index No	Set of specifications # 1 (only for trackside Subsystems. For on-board subsystems not to be applied after the transition period defined in 7.4.2.3) (ETCS Baseline 2 and GSM-R Baseline 1)			
	Reference	Name of Specification	Version	Notes
55	Intentionally deleted			
56	Intentionally deleted			
57	Intentionally deleted			
58	Intentionally deleted			
59	Intentionally deleted			
60	Intentionally deleted			
61	Intentionally deleted			
62	Reserved	RBC-RBC Test specification for safe communication interface		
63	SUBSET-098	RBC-RBC Safe Communication Interface	1.0.0	
64	EN 301 515	Global System for Mobile Communication (GSM); Requirements for GSM operation on railways	2.3.0	Note 2
65	TS 102 281	Detailed requirements for GSM operation on railways	3.0.0	Note 3
66	TS 103 169	ASCI Options for Interoperability	1.1.1	
67	(MORANE) P 38 T 9001	FFFIS for GSM-R SIM Cards	5.0	Note 10
68	ETSI TS 102 610	Railway Telecommunication; GSM; Usage of the UUIE for GSM operation on railways	1.3.0	
69	(MORANE) F 10 T 6002	FFFIS for Confirmation of High Priority Calls	5.0	
70	(MORANE) F 12 T 6002	FIS for Confirmation of High Priority Calls	5.0	
71	(MORANE) E 10 T 6001	FFFIS for Functional Addressing	4.1	
72	(MORANE) E 12 T 6001	FIS for Functional Addressing	5.1	
73	(MORANE) F 10 T 6001	FFFIS for Location Dependent Addressing	4	
74	(MORANE) F 12 T 6001	FIS for Location Dependent Addressing	3	
75	(MORANE) F 10 T 6003	FFFIS for Presentation of Functional Numbers to Called and Calling Parties	4	
76	(MORANE) F 12 T 6003	FIS for Presentation of Functional Numbers to Called and Calling Parties	4	

Index No	Set of specifications # 1 (only for trackside Subsystems. For on-board subsystems not to be applied after the transition period defined in 7.4.2.3) (ETCS Baseline 2 and GSM-R Baseline 1)			
	Reference	Name of Specification	Version	Notes
77	ERA/ERTMS/033281	Interfaces between CCS trackside and other subsystems	4.0	Note 7
78	Reserved	Safety requirements for ETCS DMI functions		
79	Not applicable	Not applicable		
80	Not applicable	Not applicable		
81	Not applicable	Not applicable		
82	Not applicable	Not applicable		

Table A 2.2

**List of mandatory specifications**

Index No	Set of specifications # 2 (ETCS Baseline 3 Maintenance Release 1 and GSM-R Baseline 1)			
	Reference	Name of Specification	Version	Notes
1	Intentionally deleted			
2	Intentionally deleted			
3	SUBSET-023	Glossary of Terms and Abbreviations	3.1.0	
4	SUBSET-026	System Requirements Specification	3.4.0	
5	SUBSET-027	FIS Juridical Recording	3.1.0	
6	ERA_ERTMS_015560	ETCS Driver Machine interface	3.4.0	
7	SUBSET-034	Train Interface FIS	3.1.0	
8	SUBSET-035	Specific Transmission Module FFFIS	3.1.0	
9	SUBSET-036	FFFIS for Eurobalise	3.0.0	
10	SUBSET-037	EuroRadio FIS	3.1.0	
11	SUBSET-038	Offline key management FIS	3.0.0	
12	SUBSET-039	FIS for the RBC/RBC handover	3.1.0	
13	SUBSET-040	Dimensioning and Engineering rules	3.3.0	
14	SUBSET-041	Performance Requirements for Interoperability	3.1.0	
15	Intentionally deleted			
16	SUBSET-044	FFFIS for Euroloop	2.4.0	
17	Intentionally deleted			

Index No	Set of specifications # 2 (ETCS Baseline 3 Maintenance Release 1 and GSM-R Baseline 1)			
	Reference	Name of Specification	Version	Notes
18	Intentionally deleted			
19	SUBSET-047	Trackside-Trainborne FIS for Radio infill	3.0.0	
20	SUBSET-048	Trainborne FFFIS for Radio infill	3.0.0	
21	Intentionally deleted			
22	Intentionally deleted			
23	SUBSET-054	Responsibilities and rules for the assignment of values to ETCS variables	3.0.0	
24	Intentionally deleted			
25	SUBSET-056	STM FFFIS Safe time layer	3.0.0	
26	SUBSET-057	STM FFFIS Safe link layer	3.0.0	
27	SUBSET-091	Safety Requirements for the Technical Interoperability of ETCS in Levels 1 and 2	3.4.0	
28	Intentionally deleted			
29	SUBSET-102	Test specification for interface "K"	2.0.0	
30	Intentionally deleted			
31	SUBSET-094	Functional requirements for an onboard reference test facility	3.0.0	
32	EIRENE FRS	GSM-R Functional requirements specification	8.0.0	Note 10
33	EIRENE SRS	GSM-R System requirements specification	16.0.0	Note 10
34	A11T6001	(MORANE) Radio Transmission FFFIS for EuroRadio	13.0.0	
35	Intentionally deleted			
36 a	Intentionally deleted			
36 b	Intentionally deleted			
36 c	SUBSET-074-2	FFFIS STM Test cases document	3.0.0	
37 a	Intentionally deleted			
37 b	SUBSET-076-5-2	Test cases related to features	3.2.0	
37 c	SUBSET-076-6-3	Test sequences	3.1.0	
37 d	SUBSET-076-7	Scope of the test specifications	3.2.0	
37 e	Intentionally deleted			

Index No	Set of specifications # 2 (ETCS Baseline 3 Maintenance Release 1 and GSM-R Baseline 1)			
	Reference	Name of Specification	Version	Notes
38	06E068	ETCS Marker-board definition	2.0	
39	SUBSET-092-1	ERTMS EuroRadio Conformance Requirements	3.0.0	
40	SUBSET-092-2	ERTMS EuroRadio test cases safety layer	3.0.0	
41	Intentionally deleted			
42	Intentionally deleted			
43	SUBSET 085	Test specification for Eurobalise FFFIS	3.0.0	
44	Intentionally deleted			
45	SUBSET-101	Interface "K" Specification	2.0.0	
46	SUBSET-100	Interface "G" Specification	2.0.0	
47	Intentionally deleted			
48	Reserved	Test specification for mobile equipment GSM-R		Note 4
49	SUBSET-059	Performance requirements for STM	3.0.0	
50	SUBSET-103	Test specification for Euroloop	1.1.0	
51	Intentionally deleted			
52	SUBSET-058	FFFIS STM Application layer	3.1.0	
53	Intentionally deleted			
54	Intentionally deleted			
55	Intentionally deleted			
56	Intentionally deleted			
57	Intentionally deleted			
58	Intentionally deleted			
59	Intentionally deleted			
60	SUBSET-104	ETCS System Version Management	3.2.0	
61	Intentionally deleted			
62	Intentionally deleted			
63	SUBSET-098	RBC-RBC Safe Communication Interface	3.0.0	
64	EN 301 515	Global System for Mobile Communication (GSM); Requirements for GSM operation on railways	2.3.0	Note 2
65	TS 102 281	Detailed requirements for GSM operation on railways	3.0.0	Note 3

Index No	Set of specifications # 2 (ETCS Baseline 3 Maintenance Release 1 and GSM-R Baseline 1)			
	Reference	Name of Specification	Version	Notes
66	TS 103 169	ASCI Options for Interoperability	1.1.1	
67	(MORANE) P 38 T 9001	FFFIS for GSM-R SIM Cards	5.0	Note 10
68	ETSI TS 102 610	Railway Telecommunication; GSM; Usage of the UUIE for GSM operation on railways	1.3.0	
69	(MORANE) F 10 T 6002	FFFS for Confirmation of High Priority Calls	5.0	
70	(MORANE) F 12 T 6002	FIS for Confirmation of High Priority Calls	5.0	
71	(MORANE) E 10 T 6001	FFFS for Functional Addressing	4.1	
72	(MORANE) E 12 T 6001	FIS for Functional Addressing	5.1	
73	(MORANE) F 10 T 6001	FFFS for Location Dependent Addressing	4	
74	(MORANE) F 12 T 6001	FIS for Location Dependent Addressing	3	
75	(MORANE) F 10 T 6003	FFFS for Presentation of Functional Numbers to Called and Calling Parties	4	
76	(MORANE) F 12 T 6003	FIS for Presentation of Functional Numbers to Called and Calling Parties	4	
77	ERA/ERTMS/033281	Interfaces between CCS trackside and other subsystems	4.0	Note 7
78	Intentionally deleted			Note 6
79	SUBSET-114	KMC-ETCS Entity Off-line KM FIS	1.0.0	
80	Intentionally deleted			Note 5
81	Reserved	Train Interface FFFIS		
82	Reserved	FFFIS TI – Safety Analysis		

Table A 2.3

**List of mandatory specifications**

Index No	Set of specifications # 3 (ETCS Baseline 3 Release 2 and GSM-R Baseline 1)			
	Reference	Name of Specification	Version	Notes
1	Intentionally deleted			
2	Intentionally deleted			

Index No	Set of specifications # 3 (ETCS Baseline 3 Release 2 and GSM-R Baseline 1)			
	Reference	Name of Specification	Version	Notes
3	SUBSET-023	Glossary of Terms and Abbreviations	3.3.0	
4	SUBSET-026	System Requirements Specification	3.6.0	
5	SUBSET-027	FIS Juridical Recording	3.3.0	
6	ERA_ERTMS_015560	ETCS Driver Machine interface	3.6.0	
7	SUBSET-034	Train Interface FIS	3.2.0	
8	SUBSET-035	Specific Transmission Module FFFIS	3.2.0	
9	SUBSET-036	FFFIS for Eurobalise	3.1.0	
10	SUBSET-037	EuroRadio FIS	3.2.0	
11	SUBSET-038	Offline key management FIS	3.1.0	
12	SUBSET-039	FIS for the RBC/RBC handover	3.2.0	
13	SUBSET-040	Dimensioning and Engineering rules	3.4.0	
14	SUBSET-041	Performance Requirements for Interoperability	3.2.0	
15	Intentionally deleted			
16	SUBSET-044	FFFIS for Euroloop	2.4.0	
17	Intentionally deleted			
18	Intentionally deleted			
19	SUBSET-047	Trackside-Trainborne FIS for Radio infill	3.0.0	
20	SUBSET-048	Trainborne FFFIS for Radio infill	3.0.0	
21	Intentionally deleted			
22	Intentionally deleted			
23	SUBSET-054	Responsibilities and rules for the assignment of values to ETCS variables	3.0.0	
24	Intentionally deleted			
25	SUBSET-056	STM FFFIS Safe time layer	3.0.0	
26	SUBSET-057	STM FFFIS Safe link layer	3.1.0	
27	SUBSET-091	Safety Requirements for the Technical Interoperability of ETCS in Levels 1 and 2	3.6.0	
28	Intentionally deleted			
29	SUBSET-102	Test specification for interface "K"	2.0.0	
30	Intentionally deleted			



Index No	Set of specifications # 3 (ETCS Baseline 3 Release 2 and GSM-R Baseline 1)			
	Reference	Name of Specification	Version	Notes
31	SUBSET-094	Functional requirements for an onboard reference test facility	3.1.0	
32	EIRENE FRS	GSM-R Functional requirements specification	8.0.0	Note 10
33	EIRENE SRS	GSM-R System requirements specification	16.0.0	Note 10
34	A11T6001	(MORANE) Radio Transmission FFFIS for EuroRadio	13.0.0	
35	Intentionally deleted			
36 a	Intentionally deleted			
36 b	Intentionally deleted			
36 c	SUBSET-074-2	FFFIS STM Test cases document	3.1.0	
37 a	Intentionally deleted			
37 b	SUBSET-076-5-2	Test cases related to features	3.3.0	
37 c	SUBSET-076-6-3	Test sequences	3.2.0	
37 d	SUBSET-076-7	Scope of the test specifications	3.3.0	
37 e	Intentionally deleted			
38	06E068	ETCS Marker-board definition	2.0	
39	SUBSET-092-1	ERTMS EuroRadio Conformance Requirements	3.1.0	
40	SUBSET-092-2	ERTMS EuroRadio test cases safety layer	3.1.0	
41	Intentionally deleted			
42	Intentionally deleted			
43	SUBSET 085	Test specification for Eurobalise FFFIS	3.0.0	
44	Intentionally deleted			
45	SUBSET-101	Interface "K" Specification	2.0.0	
46	SUBSET-100	Interface "G" Specification	2.0.0	
47	Intentionally deleted			
48	Reserved	Test specification for mobile equipment GSM-R		Note 4
49	SUBSET-059	Performance requirements for STM	3.1.0	
50	SUBSET-103	Test specification for Euroloop	1.1.0	
51	Intentionally deleted			

Index No	Set of specifications # 3 (ETCS Baseline 3 Release 2 and GSM-R Baseline 1)			
	Reference	Name of Specification	Version	Notes
52	SUBSET-058	FFFIS STM Application layer	3.2.0	
53	Intentionally deleted			
54	Intentionally deleted			
55	Intentionally deleted			
56	Intentionally deleted			
57	Intentionally deleted			
58	Intentionally deleted			
59	Intentionally deleted			
60	SUBSET-104	ETCS System Version Management	3.3.0	
61	Intentionally deleted			
62	Intentionally deleted			
63	SUBSET-098	RBC-RBC Safe Communication Interface	3.0.0	
64	EN 301 515	Global System for Mobile Communication (GSM); Requirements for GSM operation on railways	2.3.0	Note 2
65	TS 102 281	Detailed requirements for GSM operation on railways	3.0.0	Note 3
66	TS 103 169	ASCI Options for Interoperability	1.1.1	
67	(MORANE) P 38 T 9001	FFFIS for GSM-R SIM Cards	5.0	Note 10
68	ETSI TS 102 610	Railway Telecommunication; GSM; Usage of the UUIE for GSM operation on railways	1.3.0	
69	(MORANE) F 10 T 6002	FFFIS for Confirmation of High Priority Calls	5.0	
70	(MORANE) F 12 T 6002	FIS for Confirmation of High Priority Calls	5.0	
71	(MORANE) E 10 T 6001	FFFIS for Functional Addressing	4.1	
72	(MORANE) E 12 T 6001	FIS for Functional Addressing	5.1	
73	(MORANE) F 10 T 6001	FFFIS for Location Dependent Addressing	4	
74	(MORANE) F 12 T 6001	FIS for Location Dependent Addressing	3	
75	(MORANE) F 10 T 6003	FFFIS for Presentation of Functional Numbers to Called and Calling Parties	4	

Index No	Set of specifications # 3 (ETCS Baseline 3 Release 2 and GSM-R Baseline 1)			
	Reference	Name of Specification	Version	Notes
76	(MORANE) F 12 T 6003	FIS for Presentation of Functional Numbers to Called and Calling Parties	4	
77	ERA/ERTMS/033281	Interfaces between CCS trackside and other subsystems	4.0	Note 7
78	Intentionally deleted			Note 6
79	SUBSET-114	KMC-ETCS Entity Off-line KM FIS	1.1.0	
80	Intentionally deleted			Note 5
81	Reserved	Train Interface FFFIS		
82	Reserved	FFFIS TI – Safety Analysis		
83	SUBSET-137	On-line Key Management FFFIS	1.0.0	

Note 1: only the functional description of information to be recorded is mandatory, not the technical characteristics of the interface

Note 2: the points of the specifications listed in point 2.1 of EN 301 515 which are referenced in Index 32 and Index 33 as “MI” are mandatory.

Note 3: the change requests (CRs) listed in table 1 and 2 of TS 102 281 which affect points referenced in Index 32 and Index 33 as “MI” are mandatory.

Note 4: Index 48 refers only to test cases for GSM-R mobile equipment. It is kept “reserved” for the time being. When agreed in a future revision of the TSI, the catalogue of available harmonised test cases for the assessment of mobile equipment and networks, according to the steps indicated in point 6.1.2 of this TSI, will be introduced in these tables.

Note 5: the products which are on the market are already tailored to the needs of the RU related to GSM-R Driver Machine Interface and fully interoperable so there is no need for a standard in the TSI CCS.

Note 6: information that was intended for index 78 is now incorporated in Index 27 (SUBSET-091).

Note 7: this document is ETCS and GSM-R baseline independent.

Note 8: Intentionally deleted.

Note 9: Intentionally deleted.

Note 10: Only the (MI) requirements are mandated by TSI CCS.

Note 11: Intentionally deleted.

Note 12: Intentionally deleted.

Note 13: Intentionally deleted.

Note 14: Intentionally deleted.

Table A 3

**List of mandatory standards**

The application of the version of the standards listed in the table below, and their subsequent amendments when published as harmonised standard in the certification process is an appropriate means to fully comply to the risk management process as set out in Annex I of the Commission Implementing Regulation (EU) No 402/2013, without prejudice for the provisions of chapter 4 and chapter 6 of this TSI.

No	Reference	Document name and comments	Version	Note
A1	EN 50126-1	Railway applications — The specification and demonstration of reliability, availability, maintainability and safety (RAMS) – Part 1: Generic RAMS Process	2017	
			1999	1,2
A2	EN 50128	Railway applications — Communication, signalling and processing systems — Software for railway control and protection systems	2011	
A3	EN 50129	Railway applications — Communication, signalling and processing systems — Safety related electronic systems for signalling	2003	1
A4	EN 50159	Railway applications — Communication, signalling and processing systems	2010	1
A5	EN 50126-2	Railway Applications — The specification and demonstration of reliability, availability, maintainability and safety (RAMS) – Part 2: Systems Approach to Safety	2017	3

Note 1: this standard is harmonised, see “Commission Communication in the framework of the implementation of the Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community (recast)” (OJ C 435, 15.12.2017), where also published editorial corrigenda are indicated.

Note 2: this version of the standard may be used during the transitional period defined in the updated version of the standard.

Note 3: To be used in combination with EN 50126-1 (2017).

Table A 4

**List of mandatory standards for accredited laboratories**

No	Reference	Document name and comments	Version	Note
A6	ISO/IEC 17025	General requirements for the competence of testing and calibration laboratories	2017'	

(57) the Annex G is replaced by the following:

‘ANNEX G

**Open Points**

Open Point	Notes
Braking aspects	It only applies to ETCS Baseline 2 (see Annex A, Table A 2, Index 15). Resolved for ETCS Baseline 3 (see Annex A, Table A 2, Indexes 4 and 13).
Reliability/availability requirements	Frequent occurrences of degraded situations caused by failures of control-command and signalling equipment will decrease the system safety.
Characteristics of sand applied to tracks	See Annex A, Table A 2, Index 77 This is not an open point for 1 520 mm.
Characteristics of flange lubricators	See Annex A, Table A 2, Index 77
Combination of rolling stock characteristics influencing shunting impedance	See Annex A, Table A 2, Index 77
Conducted interference: — Vehicle impedance — Substation impedance (for DC networks only) — Out-band limits — Interference current limits attributed to the substations and attributed to the rolling stock — Measurement, test and evaluation specification	See Annex A, Table A 2, Index 77’

## ANNEX VII

Annex I to Decision 2011/665/EU is amended as follows:

(1) point 2.3 is replaced by the following:

**‘2.3 Users and user access rights**

ERATV shall have the following users:

Table 1

**Access rights to ERATV**

User	Access rights	Log in, user accounts
National safety authority of any Member State	Submission of data related to this Member State to be validated by the Agency. Unrestricted consultation of any data, including the data for which the validation is pending.	Logging in with user name and password. No functional or anonymous accounts shall be made available. Several accounts shall be created if the national safety authority so requires.
Agency	Registration of data related to vehicle type authorisation it has processed as authorising entity. Validation regarding the compliance with this specification and publication of the data submitted by a national safety authority. Unrestricted consultation of any data, including the data for which the validation is pending.	Logging in with user name and password.
Public	Consultation of validated data.	Not applicable.’

(2) in point 2.4, the following paragraph is added:

‘ERATV shall, as appropriate, allow for exchange of information with other information systems of the Agency such as the European Vehicle Register (“EVR”) as referred to in Decision (EU) 2018/1614, the common user interface for the railway register of infrastructure as referred to in Commission Decision 2014/880/EU (\*) and the one stop-shop (“OSS”) as referred to in Article 12 of Regulation (EU) 2016/796 of the European Parliament and of the Council (\*\*).

(\*) Commission Implementing Decision 2014/880/EU of 26 November 2014 on the common specifications of the register of railway infrastructure and repealing Implementing Decision 2011/633/EU (OJ L 356, 12.12.2014, p. 489).

(\*\*) 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 881/2004 (OJ L 138, 26.5.2016, p. 1).’;

(3) in point 2.5, the following indents are added:

- ‘EVR: the format of data on the type of vehicle in EVR shall have a one-to-one correspondence with the designation of types and, where applicable, variants or versions of type in ERATV;
- The One Stop Shop (\*) (OSS): OSS shall rely on ERATV to manage any information related to the types/variants/versions. The identification of the type shall be used as reference during the exchange of information between the systems; OSS will allow retrieving information for types/variants/versions from ERATV and will trigger the publication of the type/variant/version information in ERATV when the vehicle type authorisation is delivered;

- Single Rule Database (\*\*) containing national rules: for the national rules for vehicle authorisation: the list of parameters for which the conformity assessment is done against national rules indicated in ERATV shall be the same in the Single Rule Database. ERATV must not allow referring to any parameter not included in the Single Rule Database.

Until the Single Rules Database is operational and data migrated from the Reference Document Database and Notif-IT, the list of parameters for which the conformity assessment is done against national rules indicated in ERATV shall be the same as in the Reference Document Database. ERATV must not allow referring to any parameter not included in the Reference Document Database.

(\*) As provided for in Article 12 of Regulation (EU) 2016/796.

(\*\*) As provided for in Article 27 of Regulation (EU) 2016/796.;

- (4) point 5.1 is replaced by the following:

### 5.1 General principle

Every national safety authority shall submit information related to the authorisations of a type of vehicle or vehicle type variant it has granted.

Every national safety authority shall submit information related to the versions of a vehicle type or versions of a vehicle type variant it has received in accordance with in accordance with Article 15(3) of Regulation (EU) 2018/545.

The Agency shall directly register information related to the authorisations of a type of vehicle or vehicle type variant it has granted and information related to the versions of a vehicle type or versions of a vehicle type variant it has received.

ERATV shall include a web based tool for exchange of information between the national safety authorities and the Agency. This tool shall allow the following exchanges of information:

- (1) reservation of a type ID;
- (2) submission of data for the register by a national safety authority to the Agency including:
  - (a) data related to granting an authorisation for a new type of vehicle or a new vehicle type variant (in this case the national safety authority shall provide the full set of data as set out in Annex II);
  - (b) data related to granting an authorisation for a type of vehicle previously registered in ERATV (in this case the national safety authority shall only provide data related to the authorisation itself, i.e. fields in Section 3 of the list set out in Annex II);
  - (c) data related to registering a version of a vehicle type or version of a vehicle type variant (in this case the national safety authority shall provide the full set of data as set out in Annex II);
  - (d) data related to modification of an existing authorisation (in this case the national safety authority shall only provide data related to the fields that need to be modified; this may not include modification of data related to the characteristics of the vehicle);
  - (e) data related to suspension of an existing authorisation (in this case the national safety authority shall only provide the date of suspension);
  - (f) data related to reactivation of an existing authorisation (in this case the national safety authority shall only provide data related to the fields that need to be modified), distinguishing between
    - reactivation without modification of data,
    - reactivation with modification of data (these data may not be related to the characteristics of the vehicle);
  - (g) data related to withdrawal of an authorisation;
  - (h) data related to correction of an error;

- (3) sending of requests for data clarification and/or correction by the Agency to a national safety authority;
- (4) sending of answers by a national safety authority to the requests of clarification and/or correction done by the Agency.

The national safety authority shall submit the data for updating the register electronically by means of a web based application and using the standard web based electronic form with the relevant fields filled in as set out in Annex II.

The Agency shall check the data submitted by the national safety authority regarding their compliance with this specification, and either validate them or request a clarification.

If the Agency considers that the data submitted by the national safety authority are not in compliance with this specification, the Agency shall send the national safety authority a request for correction or clarification of the submitted data.

Upon each update of data regarding a type of vehicle the system shall generate a confirmation message, which shall be sent by email to the users of the national safety authority that submitted the data, to the national safety authority of all other Member States where the type is authorised, to the vehicle type authorisation holder and to the Agency;

- (5) point 5.2.1 is replaced by the following:

*‘5.2.1 Registering a new vehicle type authorisation, a new vehicle type variant a new version of a vehicle type or a new version of a vehicle type*

- (1) The national safety authority shall inform the Agency of any vehicle type authorisation within 20 working days following the issue of the authorisation.
- (2) The national safety authority shall inform the Agency of any vehicle type variant within 20 working days following the issue of the authorisation.
- (3) The national safety authority shall inform the Agency of any version of a vehicle type or version of a vehicle type variant it has received in accordance with Article 15(3) of Regulation (EU) 2018/545 within 20 working days following receipt of the complete information.
- (4) The Agency shall check the information submitted by the national safety authority and within 20 working days following the receipt of this information either validate it and assign a type of vehicle number as set out in Annex III or request its correction or clarification. In particular, in order to prevent an unintended duplication of types in ERATV, the Agency shall check, as far as the data available in ERATV allows, that this type has not been registered before by another Member State.
- (5) After validation of the information submitted by the national safety authority, the Agency shall assign the new type of vehicle its number. The rules for assigning the type of vehicle number are set out in Annex III.’;

- (6) point 5.3 is replaced by the following:

### **‘5.3 Entry or modification of data by the Agency**

#### *5.3.1 The authorising entity is a national safety authority*

Where a national safety authority acts as authorising entity, the Agency shall not modify data submitted by a national safety authority. The role of the Agency shall consist of validation and publication only.

In exceptional circumstances, such as technical impossibility of following the normal procedure, the Agency may, following a request from a national safety authority, enter or modify data submitted by a national safety authority. In this case, the national safety authority that requested the entry or modification of data shall confirm the data entered or modified by the Agency and the Agency shall duly document the process. The timescales for entering data in ERATV as indicated in Section 5.2 shall apply.



5.3.2 *The authorising entity is the Agency*

Where the Agency acts as authorising entity, it shall:

- (a) register any vehicle type authorisation or vehicle type variant within 20 working days following the issue of the authorisation;
- (b) register any version of a vehicle type or version of a vehicle type variant within 20 working days following receipt of the complete information;
- (c) modify any existing authorisation for a type of vehicle within 20 working days following the issue of the modification to the authorisation;
- (d) suspend any existing authorisation for a type of vehicle within 5 working days following the issue of the suspension of the authorisation;
- (e) reactivate any authorisation for a type of vehicle previously suspended within 20 working days following the issue of the reactivation of the authorisation;
- (f) withdraw any existing authorisation for a type of vehicle within 5 working days following the withdrawal of the authorisation.;

(7) section 6 is replaced by the following:

## ‘6. GLOSSARY

Term or abbreviation	Definition
Type ID	An identification for the type composed of the type number (parameter 0.1, number composed of 10 digits), the variant (parameter 0.2, alphanumeric composed of three characters) and the version (parameter 0.4, alphanumeric composed of three characters): TypeID = Type number+Variant+Version = XX-XXX-XXXX-X-ZZZ-VVV
Restriction	Any condition or limitation indicated in the authorisation of type of vehicle that applies to placing on the market or use of any vehicle in conformity with this type. Restrictions do not include technical characteristics that are included in Section 4 of Annex II (List and format of parameters).
Modification of authorisation	Modification, at the request of an authorising entity, of information of the registered vehicle type authorisation previously published which needs to be changed.
Suspension of authorisation	Decision taken by an authorising entity according to which an authorisation for a vehicle type is temporarily suspended and no vehicle may be authorised to be placed on the market on the basis of its conformity to the given type, until the causes that motivated the suspension have been analysed. Suspension of authorisation for a vehicle type does not apply to the vehicles already in use.
Reactivation of authorisation	Decision taken by an authorising entity according to which a suspension of authorisation it previously issued no longer applies.
Authorisation to be renewed	Decision taken by an authorising entity according to which an authorisation for a vehicle type needs to be renewed in accordance with Article 24(3) of Directive (EU) 2016/797 and no vehicle may be authorised to be placed on the market on the basis of its conformity to the given type. Authorisation to be renewed status for a vehicle type does not affect the vehicles already in use.
Revocation of authorisation	Decision taken in accordance with Article 26 of Directive (EU) 2016/797 by an authorising entity according to which an authorisation for a vehicle type is no longer valid. Vehicle already authorised to be placed on the market on the basis of its type shall be withdrawn.
Error	Transmitted or published data that do not correspond to the given authorisation for type of vehicle. Modification of authorisation does not fall under this definition.’

## ANNEX VIII

Annex II to Decision 2011/665/EU is replaced by the following:

## ANNEX II

**DATA TO BE REGISTERED AND FORMAT**

- (1) For each authorised type of vehicle, ERATV shall include the following data:
  - (a) identification of the type;
  - (b) manufacturer;
  - (c) conformity with the TSIs;
  - (d) authorisations, including general information about these authorisations, their status, list of parameters for which conformity with national rules has been checked;
  - (e) technical characteristics.
- (2) The data to be registered in ERATV for each type of vehicle and their format shall be as indicated in Table 2. The data to be registered depend on the category of the vehicle as indicated in Table 2.
- (3) The values indicated for the parameters related to the technical characteristics shall be those recorded in the file accompanying the application.
- (4) In the cases where possible values for a parameter are limited to a predefined list, these lists shall be maintained and updated by the Agency.
- (5) For the types of vehicle that are not in conformity with all the relevant TSIs in force, the national safety authority that has granted the type authorisation may limit the information to be provided on the technical characteristics indicated in Section 4 below to the parameters that have been checked according to the applicable rules.
- (6) Where a parameter is defined in the applicable TSI, the value indicated for the parameter shall be the one assessed in the verification procedure.
- (7) Predefined lists shall be maintained and kept updated by the Agency in accordance with the TSIs in force, including the TSIs that may be applied during a transitional period.
- (8) For parameters indicated as “open point” no data shall be introduced until the “open point” is closed in the relevant TSI.
- (9) For parameters indicated as “optional”, indication of data shall be subject to the decision of the applicant for the type authorisation.
- (10) Fields 0.1-0.4 shall be filled in by the Agency.

Table 2

## Parameters of ERATV

Parameter	Data format	Applicability to vehicle categories (Yes, No, Optional, Open Point)				Parameters for technical compatibility between Vehicle and the network(s) of area of use	
		1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles		
<b>0</b>	<b>Identification of the type</b>	<b>Heading (no data)</b>					
0.1	Type number (in accordance with Annex III)	[number] XX-XXX-XXXX-X	Y	Y	Y	Y	
0.2	Variant included in this type (in accordance with Article 2(13) of Regulation (EU) 2018/545)	[alphanumeric] ZZZ	Y	Y	Y	Y	
0.4	Versions included in this type. (in accordance with Article 2(14) of Regulation (EU) 2018/545)	[alphanumeric] VVV	Y	Y	Y	Y	
0.3	Date of record in ERATV	[date] YYYYMMDD	Y	Y	Y	Y	
<b>1</b>	<b>General information</b>	<b>Heading (no data)</b>					
1.1	Type name	[character string] (max 256 characters)	O	O	O	O	
1.2	Alternative type name	[character string] (max 256 characters)	O	O	O	O	
<b>1.3</b>	<b>Manufacturer's name</b>	<b>Heading (no data)</b>					
<b>1.3.1</b>	<b>Manufacturer identification data</b>	<b>Heading (no data)</b>					
1.3.1.1	Name of organisation	[character string] (max 256 characters) Selection from a predefined list, possibility to add new organisations	Y	Y	Y	Y	
1.3.1.2	Registered business number	Text	O	O	O	O	
1.3.1.3	Organisation code	Alphanumeric code	O	O	O	O	

Parameter	Data format	Applicability to vehicle categories (Yes, No, Optional, Open Point)				Parameters for technical compatibility between Vehicle and the network(s) of area of use	
		1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles		
<b>1.3.2</b>	<b>Manufacturer contact data</b>	<b>Heading (no data)</b>					
1.3.2.1	Address of organisation, street and number	Text	O	O	O	O	
1.3.2.2	Town	Text	O	O	O	O	
1.3.2.3	Country code	Code as in EU interinstitutional style guide	O	O	O	O	
1.3.2.4	Post code	Alphanumeric code	O	O	O	O	
1.3.2.5	Email address	Email	O	O	O	O	
1.4	Category	[character string] Selection from a predefined list (according to Annex III)	Y	Y	Y	Y	
1.5	Subcategory	[character string] Selection from a predefined list (according to Annex III)	Y	Y	Y	Y	
<b>2</b>	<b>Conformity with TSIs</b>	<b>Heading (no data)</b>					
2.1	Conformity with TSI	For each TSI: [character string] Y/N/Partial/Not applicable Selection from a predefined list of vehicle related TSIs (both in force and those that were previously in force) (multiple selection possible)	Y	Y	Y	Y	
2.2	EC certificate of verification: Reference of "EC type examination certificates" (if module SB applied) and/or "EC design examination certificates" (if module SH1 applied)	[character string] (possibility to indicate several certificates, e.g. certificate for rolling stock subsystem, certificate for CCS, etc.)	Y	Y	Y	Y	
2.3	Applicable specific cases (specific cases conformity with which has been assessed)	[character string] Selection from a predefined list (multiple selection possible) based on TSIs (for each TSI marked as Y or P)	Y	Y	Y	Y	

Parameter	Data format	Applicability to vehicle categories (Yes, No, Optional, Open Point)				Parameters for technical compatibility between Vehicle and the network(s) of area of use	
		1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles		
2.4	Sections of TSI not complied with	[character string] Selection from a predefined list (multiple selection possible) based on TSIs (for each TSI marked as P)	Y	Y	Y	Y	
<b>3</b>	<b>Authorisations</b>	<b>Heading (no data)</b>					
3.0	Area of use	[character string] Selection from a predefined list (multiple selection): MS — Network	Y	Y	Y	Y	
<b>3.1</b>	<b>Authorisation in</b>	<b>Heading (no data)</b>					
3.1.1	Member State of authorisation	[character string] Selection from a predefined list (multiple selection)	Y	Y	Y	Y	
<b>3.1.2</b>	<b>Current status</b>	<b>Heading (no data)</b>					
3.1.2.1	Status	[character string] + [date] Possible options: Valid, Suspended YYYYMMDD, Revoked YYYYMMDD, to be renewed YYYYMMDD	Y	Y	Y	Y	
3.1.2.2	Validity of authorisation (if defined)	[date] YYYYMMDD	Y	Y	Y	Y	
3.1.2.3	Coded conditions for use and other restrictions	[character string] Code assigned by the Agency	Y	Y	Y	Y	
3.1.2.4	Non-coded conditions for use and other restrictions	[character string]	Y	Y	Y	Y	
<b>3.1.3</b>	<b>Historical</b>	<b>Heading (no data)</b>					
<b>3.1.3.1</b>	<b>Original authorisation</b>	<b>Heading (no data)</b>					
3.1.3.1.1	Date of the original authorisation	[date] YYYYMMDD	Y	Y	Y	Y	

	Parameter	Data format	Applicability to vehicle categories (Yes, No, Optional, Open Point)				Parameters for technical compatibility between Vehicle and the network(s) of area of use
			1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles	
<b>3.1.3.1.2</b>	<b>Authorisation holder</b>	<b>Heading (no data)</b>					
<b>3.1.3.1.2.1</b>	<b>Authorisation holder identification data</b>	<b>Heading (no data)</b>					
3.1.3.1.2.1.1	Name of organisation	[character string] (max 256 characters) Selection from a predefined list, possibility to add new organisations	Y	Y	Y	Y	
3.1.3.1.2.1.2	Registered business number	Text	Y	Y	Y	Y	
3.1.3.1.2.1.3	Organisation code	Alphanumeric code	O	O	O	O	
<b>3.1.3.1.2.2</b>	<b>Authorisation holder contact data</b>	<b>Heading (no data)</b>					
3.1.3.1.2.2.1	Address of organisation, street and number	Text	Y	Y	Y	Y	
3.1.3.1.2.2.2	Town	Text	Y	Y	Y	Y	
3.1.3.1.2.2.3	Country code	Code as in EU interinstitutional style guide	Y	Y	Y	Y	
3.1.3.1.2.2.4	Post code	Alphanumeric code	Y	Y	Y	Y	
3.1.3.1.2.2.5	Email address	Email	Y	Y	Y	Y	
3.1.3.1.3	Authorisation document reference	[character string] (EIN)	Y	Y	Y	Y	
3.1.3.1.4	Certificate of verification: Reference of type examination or design examination type	[character string] (Possibility to indicate several certificates, e.g. certificate for rolling stock subsystem, certificate for Control, command and signalling subsystem, etc.)	Y	Y	Y	Y	

Parameter	Data format	Applicability to vehicle categories (Yes, No, Optional, Open Point)				Parameters for technical compatibility between Vehicle and the network(s) of area of use	
		1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles		
3.1.3.1.5	Parameters for which conformity to applicable national rules has been assessed	[character string] Selection from a predefined list (multiple selection possible) based on Commission Decision 2015/2299/EU	Y	Y	Y	Y	
3.1.3.1.6	Comments	[character string] (max 1 024 characters)	O	O	O	O	
3.1.3.1.7	Reference to the written declaration by the proposer referred to in Article 3(11) of Regulation (EU) No 402/2013	[character string]	Y	Y	Y	Y	
<b>3.1.3.X</b>	<b>Modification of authorisation</b>	<b>Heading (no data) (X is progressive from 2 onwards, as many times as modifications of the authorisation of type have been issued)</b>	Y	Y	Y	Y	
3.1.3.X.1	Type of modification	[character string] Text from a predefined list	Y	Y	Y	Y	
3.1.3.X.2	Date	[date] YYYYMMDD	Y	Y	Y	Y	
3.1.3.X.3	Authorisation holder (if applicable)	[character string] (max 256 characters) Selection from a predefined list, possibility to add new organisations	Y	Y	Y	Y	
<b>3.1.3.X.3.1</b>	<b>Authorisation holder identification data</b>	<b>Heading (no data)</b>					
3.1.3.X.3.1.1	Name of organisation	[character string] (max 256 characters) Selection from a predefined list, possibility to add new organisations	Y	Y	Y	Y	
3.1.3.X.3.1.2	Registered business number	Text	Y	Y	Y	Y	

	Parameter	Data format	Applicability to vehicle categories (Yes, No, Optional, Open Point)				Parameters for technical compatibility between Vehicle and the network(s) of area of use
			1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles	
3.1.3.X.3.1.3	Organisation code	Alphanumeric code	O	O	O	O	
<b>3.1.3.X.3.2</b>	<b>Authorisation holder contact data</b>	<b>Heading (no data)</b>					
3.1.3.X.3.2.1	Address of organisation, street and number	Text	Y	Y	Y	Y	
3.1.3.X.3.2.2	Town	Text	Y	Y	Y	Y	
3.1.3.X.3.2.3	Country code	Code as in EU interinstitutional style guide	Y	Y	Y	Y	
3.1.3.X.3.2.4	Post code	Alphanumeric code	Y	Y	Y	Y	
3.1.3.X.3.2.5	Email address	Email	Y	Y	Y	Y	
3.1.3.X.4	Authorisation modification document reference	[character string]	Y	Y	Y	Y	
3.1.3.X.5	Certificate of verification: Reference of type examination or design examination type	[character string] (possibility to indicate several certificates, e.g. certificate for rolling stock subsystem, certificate for CCS, etc.)	Y	Y	Y	Y	
3.1.3.X.6	Applicable national rules (if applicable)	[character string] Selection from a predefined list (multiple selection possible) based on Commission Decision 2015/2299/EU	Y	Y	Y	Y	
3.1.3.X.7	Comments	[character string] (max 1 024 characters)	O	O	O	O	
3.1.3.X.8	Reference to the written declaration by the proposer referred to in Article 3(11) of Regulation (EU) No 402/2013	[character string]	Y	Y	Y	Y	



Parameter	Data format	Applicability to vehicle categories (Yes, No, Optional, Open Point)				Parameters for technical compatibility between Vehicle and the network(s) of area of use	
		1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles		
<b>3.X</b>	<b>Authorisation in</b>	<b>Heading (no data) (X is progressive incremented by one unit from 2 onwards each time an authorisation for this type has been granted). This Section contains same fields as 3.1</b>	Y	Y	Y	Y	
<b>4</b>	<b>Technical characteristics of the vehicle</b>	<b>Heading (no data)</b>					
<b>4.1</b>	<b>General technical characteristics</b>	<b>Heading (no data)</b>					
4.1.1	Number of driving cabs	[Number] 0/1/2	Y	Y	Y	Y	N
<b>4.1.2</b>	<b>Speed</b>	<b>Heading (no data)</b>					
4.1.2.1	Maximum design speed	[Number] km/h	Y	Y	Y	Y	N
4.1.3	Wheel set gauge	[character string] Selection from predefined list	Y	Y	Y	Y	Y
4.1.5	Maximum number of trainsets or locomotives coupled together in multiple operation.	[number]	Y	N	N	N	N
4.1.11	Wheelset gauge changeover facility	[character string] Selection from predefined list	Y	Y	Y	Y	Y
4.1.12	Number of vehicles composing the fixed formation (for fixed formation only)	[number]	Y	Y	Y	Y	N
<b>4.2</b>	<b>Vehicle gauge</b>	<b>Heading (no data)</b>					
4.2.1	Reference profile	[character string] Selection from predefined list (more than one possible) (the list will be different for different categories depending on the applicable TSI)	Y	Y	Y	Y	Y

Parameter	Data format	Applicability to vehicle categories (Yes, No, Optional, Open Point)				Parameters for technical compatibility between Vehicle and the network(s) of area of use	
		1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles		
<b>4.3</b>	<b>Environmental conditions</b>	<b>Heading (no data)</b>					
4.3.1	Temperature range	[character string] Selection from a predefined list (more than one possible)	Y	Y	Y	Y	N
4.3.3	Snow, ice and hail conditions	[character string] Selection from a predefined list	Y	Y	Y	Y	N
<b>4.4</b>	<b>Fire safety</b>	<b>Heading (no data)</b>					
4.4.1	Fire safety category	[character string] Selection from a predefined list	Y	Y	N	Y	Y
<b>4.5</b>	<b>Design mass and loads</b>	<b>Heading (no data)</b>					
4.5.1	Permissible payload for different line categories	[number] t for line category [character string]	OP	OP	Y	OP	Y
<b>4.5.2</b>	<b>Design mass</b>	<b>Heading (no data)</b>					
4.5.2.1	Design mass in working order	[number] kg	Y	Y	O	Y	Y
4.5.2.2	Design mass under normal payload	[number] kg	Y	Y	O	Y	Y
4.5.2.3	Design mass under exceptional payload	[number] kg	Y	Y	N	Y	Y
<b>4.5.3</b>	<b>Static axle load</b>	<b>Heading (no data)</b>					
4.5.3.1	Static axle load in working order	[number] kg	Y	Y	O	Y	Y
4.5.3.2	Static axle load under normal payload	[number] kg	Y	Y	Y	Y	Y
4.5.3.3	Static axle load under exceptional payload	[number] kg	Y	Y	N	Y	Y

	Parameter	Data format	Applicability to vehicle categories (Yes, No, Optional, Open Point)				Parameters for technical compatibility between Vehicle and the network(s) of area of use
			1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles	
4.5.3.4	Position of the axles along the unit (axle spacing): a: Distance between axles b: Distance from end axle to the end of the nearest coupling plane c: distance between two inside axles	a [number] m b [number] m c [number] m	Y	Y	Y	Y	Y
4.5.5	Total vehicle mass (for each vehicle of the unit)	[number] kg	Y	Y	Y	Y	Y
4.5.6	Mass per wheel	[number] kg	Y	Y	Y	Y	Y
<b>4.6</b>	<b>Rolling stock dynamic behaviour</b>	<b>Heading (no data)</b>					
4.6.4	Combination of maximum speed and maximum cant deficiency for which the vehicle was assessed	[number] km/h - [number] mm	Y	Y	Y	Y	Y
4.6.5	Rail inclination	[character string] from a predefined list	Y	Y	Y	Y	Y
<b>4.7</b>	<b>Braking</b>	<b>Heading (no data)</b>					
4.7.1	Maximum average deceleration	[number] m/s <sup>2</sup>	Y	N	N	Y	N
<b>4.7.2</b>	<b>Thermal capacity</b>	<b>Heading (no data)</b>					
<b>4.7.2.1</b>	<b>Brake performance on steep gradi- ents with normal payload</b>	<b>Heading (no data)</b>					
4.7.2.1.1	Reference case of TSI	[character string] from a predefined list	Y	Y	Y	Y	N
4.7.2.1.2	Speed (if no reference case is indi- cated)	[number] km/h	Y	Y	Y	Y	N

	Parameter	Data format	Applicability to vehicle categories (Yes, No, Optional, Open Point)				Parameters for technical compatibility between Vehicle and the network(s) of area of use
			1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles	
4.7.2.1.3	Gradient (if no reference case is indicated)	[number] ‰ (mm/m)	Y	Y	Y	Y	N
4.7.2.1.4	Distance (if no reference case is indicated)	[number] km	Y	Y	Y	Y	N
4.7.2.1.5	Time (if distance is not indicated) (if no reference case is indicated)	[number] min	Y	Y	Y	Y	N
4.7.2.1.6	Maximum brake thermal energy capacity	[number] kW	Y	Y	Y	Y	N
<b>4.7.3</b>	<b>Parking brake</b>	<b>Heading (no data)</b>					
4.7.3.3	Maximum gradient on which the unit is kept immobilised by the parking brake alone (if the vehicle is fitted with it)	[number] ‰ (mm/m)	Y	Y	Y	Y	N
4.7.3.4	Parking brake	[Boolean] Y/N	N	N	Y	N	N
<b>4.7.4</b>	<b>Braking systems fitted on the vehicle</b>	<b>Heading (no data)</b>					
<b>4.7.4.1</b>	<b>Eddy current brake</b>	<b>Heading (no data)</b>					
4.7.4.1.1	Eddy current track brake fitted	[Boolean] Y/N	Y	Y	N	Y	Y
4.7.4.1.2	Possibility of preventing the use of the eddy current track brake (only if fitted with eddy current track brake)	[Boolean] Y/N	Y	Y	N	Y	Y
<b>4.7.4.2</b>	<b>Magnetic brake</b>	<b>Heading (no data)</b>					
4.7.4.2.1	Magnetic track brake fitted	[Boolean] Y/N	Y	Y	N	Y	Y
4.7.4.2.2	Possibility of preventing the use of the magnetic track brake (only if fitted with magnetic brake)	[Boolean] Y/N	Y	Y	N	Y	Y

Parameter	Data format	Applicability to vehicle categories (Yes, No, Optional, Open Point)				Parameters for technical compatibility between Vehicle and the network(s) of area of use	
		1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles		
<b>4.7.4.3</b>	<b>Regenerative brake (only for vehicles with electrical traction)</b>	<b>Heading (no data)</b>					
4.7.4.3.1	Regenerative brake fitted	[Boolean] Y/N	Y	N	N	Y	Y
4.7.4.3.2	Possibility of preventing the use of the regenerative brake (only if fitted with regenerative brake)	[Boolean] Y/N	Y	N	N	Y	Y
4.7.5	Emergency brake: Stopping distance and deceleration profile for each load condition per design maximum speed	[number] m [number] m/s <sup>2</sup>	Y	Y	N	Y	N
4.7.6	For general operation: Brake weight percentage (lambda) or Braked mass	Lambda (%) [number] tonnes	Y	Y	Y	Y	N
4.7.7	Service brake: At maximum service brake: Stopping distance, Maximum deceleration, for the load condition "design mass under normal payload" at the design maximum speed.	[number] m [number] m/s <sup>2</sup>	Y	Y	Y	Y	N
4.7.8	Wheel slide protection system	[Boolean] Y/N	Y	Y	Y	Y	N
<b>4.8</b>	<b>Geometrical characteristics</b>	<b>Heading (no data)</b>					
4.8.1	Vehicle length	[number] m	Y	Y	Y	Y	N
4.8.2	Minimum in-service wheel diameter	[number] mm	Y	Y	Y	Y	Y
4.8.4	Minimum horizontal curve radius capability	[number] m	Y	Y	N	Y	Y
4.8.5	Minimum vertical convex curve radius capability	[number] m	Y	Y	Y	Y	N
4.8.6	Minimum vertical concave curve radius capability	[number] m	Y	Y	Y	Y	N

Parameter	Data format	Applicability to vehicle categories (Yes, No, Optional, Open Point)				Parameters for technical compatibility between Vehicle and the network(s) of area of use	
		1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles		
<b>4.9</b>	<b>Equipment</b>	<b>Heading (no data)</b>					
4.9.1	Type of end coupling	[Character string] From a predefined list (multiple selection possible)	Y	Y	Y	Y	N
4.9.2	Axle bearing condition monitoring (hot axles box detection)	[Character string] From a predefined list (multiple selection possible)	Y	Y	Y	Y	Y
<b>4.10</b>	<b>Energy supply</b>	<b>Heading (no data)</b>					
4.10.1	Energy supply system (voltage and frequency)	[Character string] From a predefined list (multiple selection possible)	Y	Y	N	Y	Y
4.10.4	Maximum current at standstill per pantograph (to be indicated for each DC systems the vehicle is equipped for)	[Number] A for [Voltage automatically prefilled in]	Y	Y	N	Y	N
4.10.5	Height of interaction of pantograph with contact wires (over top of rail) (to be indicated for each energy supply system the vehicle is equipped for)	[Number] From [m] to [m] (with two decimals)	Y	Y	N	Y	Y
4.10.6	Pantograph head geometry (to be indicated for each energy supply system the vehicle is equipped for)	[Character string] for [energy supply system automatically prefilled in] From a predefined list (multiple selection possible)	Y	Y	N	Y	Y
4.10.7	Number of pantographs in contact with the overhead contact line (OCL) (to be indicated for each energy supply system the vehicle is equipped for)	[Number]	Y	Y	N	Y	Y

	Parameter	Data format	Applicability to vehicle categories (Yes, No, Optional, Open Point)				Parameters for technical compatibility between Vehicle and the network(s) of area of use
			1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles	
4.10.8	Shortest distance between two pantographs in contact with the OCL (to be indicated for each energy supply system the vehicle is equipped for; to be indicated for single and, if applicable, multiple operation) (only if number of raised pantographs is more than 1)	[Number] [m]	Y	Y	N	Y	Y
4.10.10	Material of pantograph contact strip the vehicle may be equipped with (to be indicated for each energy supply system the vehicle is equipped for)	[Character string] for [energy supply system automatically prefilled in] From a predefined list (multiple selection possible)	Y	Y	N	Y	Y
4.10.11	Automatic dropping device (ADD) fitted (to be indicated for each energy supply system the vehicle is equipped for)	[Boolean] Y/N	Y	Y	N	Y	Y
4.10.14	Electric units equipped with power or current limitation function	[Boolean] Y/N	Y	N	N	Y	Y
4.10.15	Mean contact force	[Number] [N]	Y	Y	N	Y	Y
<b>4.12</b>	<b>Passenger related characteristics</b>	<b>Heading (no data)</b>					
4.12.3.1	Platform heights for which the vehicle is designed.	[Number] from predefined list (multiple selection possible)	Y	Y	N	N	Y
<b>4.13</b>	<b>On-board CCS equipment (for vehicles with a driving cab only)</b>	<b>Heading (no data)</b>					
<b>4.13.1</b>	<b>Signalling</b>	<b>Heading (no data)</b>					
4.13.1.1	ETCS equipment on-board and the set of specifications from CCS TSI Annex A	[Character string] From a predefined list	Y	N	N	Y	Y
4.13.1.5	Class B or other train protection, control and warning systems installed (system and, if applicable, version)	[Character string] From a predefined list (more than one option possible)	Y	N	N	Y	Y

Parameter	Data format	Applicability to vehicle categories (Yes, No, Optional, Open Point)				Parameters for technical compatibility between Vehicle and the network(s) of area of use	
		1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles		
4.13.1.7	ETCS on-board implementation	[Character string]	Y	N	N	Y	Y
4.13.1.8	ETCS System Compatibility	[Character string] From a predefined list (more than one option possible)	Y	N	N	Y	N
4.13.1.9	Managing information about the completeness of the train	[Boolean] Y/N	Y	N	N	Y	Y
<b>4.13.2</b>	<b>Radio</b>	<b>Heading (no data)</b>					
4.13.2.1	GSM-R Radio voice on board and its Baseline	[Character string] From a predefined list	Y	N	N	Y	Y
4.13.2.3	Class B or other radio systems installed (system and, if applicable, version)	[Character string] From a predefined list (more than one option possible)	Y	N	N	Y	Y
4.13.2.5	Radio Voice System Compatibility	[Character string] From a predefined list (more than one option possible)	Y	N	N	Y	N
4.13.2.6	Voice and operational communication implementation	[Character string]	Y	N	N	Y	Y
4.13.2.7	GSM-R Radio Data communication on board and its Baseline	[Character string] From a predefined list	Y	N	N	Y	Y
4.13.2.8	Radio Data System Compatibility	[Character string] From a predefined list (more than one option possible)	Y	N	N	Y	N
4.13.2.9	Data communication application for ETCS implementation	[Character string]	Y	N	N	Y	Y
4.13.2.10	Voice SIM Card GSM-R Home Network	[Character string] From a predefined list	Y	N	N	Y	N
4.13.2.11	Data SIM Card GSM-R Home Network	[Character string] From a predefined list	Y	N	N	Y	N



Parameter	Data format	Applicability to vehicle categories (Yes, No, Optional, Open Point)				Parameters for technical compatibility between Vehicle and the network(s) of area of use	
		1. Traction vehicles	2. Hauled passenger vehicles	3. Freight wagons	4. Special vehicles		
4.13.2.12	Voice SIM Card support of Group ID 555	[Boolean] Y/N	Y	N	N	Y	N
<b>4.14</b>	<b>Compatibility with train detection systems</b>	<b>Heading (no data)</b>					
4.14.1	Type of train detection systems for which the vehicle has been designed and assessed	[Character string] From a predefined list (more than one option possible)	Y	Y	Y	Y	Y

**COMMISSION IMPLEMENTING REGULATION (EU) 2019/777****of 16 May 2019****on the common specifications for the register of railway infrastructure and repealing  
Implementing Decision 2014/880/EU****(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 Union <sup>(1)</sup>, and in particular Article 49(5) thereof,

Whereas:

- (1) Directive (EU) 2016/797 clarifies the roles of railway actors, especially railway undertakings and infrastructure managers, in relation to the checks to be performed before the use of authorised vehicles.
- (2) The register of railway infrastructure should provide transparency on the characteristics of the network and be used as a reference database. In particular, it should be used in combination with the values of the parameters recorded in the vehicle authorisation for placing on the market, to check the technical compatibility between a vehicle and a route.
- (3) The list of parameters of the register of railway infrastructure and the common user interface set out in Commission Implementing Decision 2014/880/EU <sup>(2)</sup> should be updated in order to allow for the checking of vehicle-route compatibility. At the same time, the register of infrastructure web-based application (RINF Application) should replace the common user interface.
- (4) The RINF Application should be set up and managed by the European Union Agency for Railways (the 'Agency') and should provide access to the Member States' asset record stating the values of the network parameters of each subsystem or part of subsystem concerned. In particular, Member States should use it to comply with the publication obligation provided for in Article 49(1) of Directive (EU) 2016/797, in order to provide users with a single entry point.
- (5) Data relating to the parameters specified in the table in the Annex to Implementing Decision 2014/880/EU is to be collected and inserted, for the whole Union rail system, in the register of railway infrastructure by 16 March 2019, in accordance with Article 5 of that Decision. Data relating to new parameters specified in this Regulation should be collected and inserted in the register of infrastructure in due time to achieve the objectives of Directive (EU) 2016/797, in particular to allow for the checking of vehicle-route compatibility on the basis of the RINF Application. RINF Application should be operational at the latest when this Regulation enters into application and data relating to parameters relevant for the checking of vehicle-route compatibility should be collected and inserted by 16 January 2020 at the latest and as soon as practicable.
- (6) Each Member State should designate a national registration entity to be responsible for the coordination of the submission and regular update of data of its register of infrastructure.
- (7) Infrastructure managers should collect data relating to their network and ensure that data submitted to registration entities is complete, consistent, accurate and up to date.
- (8) Further developments of the RINF Application should facilitate the checking of vehicle-route compatibility and the compilation of the route book with information from the RINF Application. The Agency should assess the benefits and cost of RINF Application add-ons and implement them as appropriate.
- (9) The Agency should set up an application guide describing and where necessary explaining the requirements of this Regulation. The guidelines should be updated, published and made available to the public free of charge.

<sup>(1)</sup> OJ L 138, 26.5.2016, p. 44.

<sup>(2)</sup> Commission Implementing Decision 2014/880/EU of 26 November 2014 on the common specifications of the register of railway infrastructure and repealing Implementing Decision 2011/633/EU (OJ L 356, 12.12.2014, p. 489).

- (10) On 27 July 2018, the Agency issued a recommendation on the common specifications for the register of railway infrastructure to update the functions of the register of infrastructure with Directive (EU) 2016/797.
- (11) Implementing Decision 2014/880/EU should therefore be repealed.
- (12) The measures provided for in this Regulation are in accordance with the opinion of the Committee referred to in Article 51(1) of Directive (EU) 2016/797,

HAS ADOPTED THIS REGULATION:

*Article 1*

**Common specifications for the register of infrastructure**

1. The common specifications for the register of infrastructure referred to in Article 49 of Directive (EU) 2016/797 shall be those laid down in the Annex to this Regulation.
2. Each Member State shall ensure the values of the parameters of its railway network are computerised in an electronic application which shall comply with the common specifications of this Regulation.

*Article 2*

**RINF Application**

1. The Agency shall set up and maintain a web-based application ('RINF Application') to act as single entry point for the publication of Member States' infrastructure information in accordance with Article 49 of Directive (EU) 2016/797.
2. The RINF Application shall be set up in accordance with the Annex to this Regulation.
3. The Agency shall ensure that the RINF Application is operational by 16 June 2019 at the latest.
4. Each Member State shall ensure that the necessary data for its network is collected and inserted in the RINF Application by the dates set out in Table 1 in the Annex.
5. Each Member State shall ensure that data in the RINF Application is maintained updated in accordance with Article 5.
6. The Agency shall set up a group composed of representatives of the national registration entities to coordinate, monitor and support the population of the RINF Application.

*Article 3*

**Transition**

1. Deadlines for the population of the register of infrastructure stipulated in Implementing Decision 2014/880/EU and set out in the Annex to this Regulation remain applicable.
2. Member States and the Agency shall ensure that the data collected and inserted in the register of infrastructure in accordance with Implementing Decision 2014/880/EU remains available, and shall ensure it is accessible via the RINF Application.

*Article 4*

**National registration entity**

1. Each Member State shall designate a national registration entity in charge of coordinating the Member State's collecting and inserting the data to the RINF Application.

2. Each Member States shall notify the Agency by 16 June 2019 at the latest of the national registration entity designated in accordance with paragraph 1 if that entity is not the body designated in accordance with Article 6(2) of Implementing Decision 2014/880/EU.

3. From 1 January 2021, subject to the development of RINF application referred to in Article 6(1)(a), infrastructure managers of each Member States shall be in charge of collecting and inserting the data to the RINF Application.

#### Article 5

##### Collection of data

1. Infrastructure managers shall ensure the accuracy, completeness, consistency and timeliness of data in the RINF Application and submit updated data as soon as such data becomes available.

2. Until 31 December 2020, infrastructure managers shall submit data to registration entities. Registration entities shall submit data to the RINF application at least every month unless no data needs to be updated. In the latter case, registration entities shall inform the Agency that no data needs to be updated. One update shall coincide with the annual publication of the network statement.

3. From 1 January 2021, subject to the development of RINF application referred to in Article 6(1)(a), infrastructure managers shall directly submit data to the RINF application, as soon as such data becomes available.

4. Information relating to infrastructures placed in service after 16 June 2019 shall be submitted to the RINF application before the placing in service.

#### Article 6

##### Further developments

1. The Agency, taking into account the result of a cost-benefit analysis, shall update the RINF application by 1 January 2021 in order to:

- (a) streamline the process of updating data in the RINF Application in order to allow infrastructure managers to update information as soon as it becomes available;
- (b) improve the description of the network so as to display its geometry accurately;
- (c) provide information regarding possible routing on the network;
- (d) provide means for alerting railway undertakings regarding changes in the RINF Application relevant to them.

2. By 16 January 2022, the Agency, taking into account the result of a cost-benefit analysis, shall update the RINF application to enable the collection and insertion of information necessary for the Route Book referred to in Appendix D2 to Commission Implementing Regulation (EU) 2019/773 <sup>(3)</sup>. Each Member State shall ensure that its register of infrastructure provides the information necessary for the Route Book one year after the RINF Application has been updated.

3. Further developments of the RINF application may create a data system feeding into all electronic information flows in respect of the Union rail network.

#### Article 7

##### Guide on the application of the common specifications

By 16 June 2019 at the latest, the Agency shall publish a guide on the application of the common specifications for the register of infrastructure (application guide). The Agency shall keep the application guide up to date. The application guide shall provide a reference to the relevant provisions of the technical specifications of interoperability for each parameter.

<sup>(3)</sup> Commission Implementing Regulation (EU) 2019/773 of 16 May 2019 on the technical specification for interoperability relating to the operation and traffic management subsystem of the rail system within the European Union and repealing Decision 2012/757/EU (See page 5 of this Official Journal).

*Article 8*

**Repeal**

Implementing Decision 2014/880/EU is repealed.

*Article 9*

**Entry into force and application**

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

It shall apply from 16 June 2019.

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

Done at Brussels, 16 May 2019.

*For the Commission*  
*The President*  
Jean-Claude JUNCKER

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## ANNEX

## 1. TECHNICAL SCOPE

These specifications concern data about the following structural subsystems of the Union rail system:

- (a) the infrastructure subsystem;
- (b) the energy subsystem;
- (c) the trackside control-command and signalling subsystem.

## 2. PURPOSE

The main purpose of the register of infrastructure is to set out transparent characteristics of the network and be used as a reference database.

2.1. **Processes to be supported by the register of infrastructure**

The register of infrastructure shall support the following processes:

- (a) check before the use of authorised vehicles in accordance with Article 23 of Directive (EU) 2016/797;
- (b) design of mobile subsystems;
- (c) check of the feasibility of train services;
- (d) publication of rules and restrictions of a strictly local nature in accordance with Article 14(11) of Directive (EU) 2016/797;
- (e) verification of technical compatibility between fixed installations in accordance with point (b) of Article 18(4) of Directive (EU) 2016/797;
- (f) monitoring of the progress of interoperability in the Union rail system;
- (g) establishment of the network statement relating to the nature of infrastructure;
- (h) compilation of the Route Book referred to in Appendix D2 to Implementing Regulation (EU) 2019/773 in accordance with Article 6(2);
- (i) reuse of data in the register of infrastructure in other IT tools.

2.2. **Specific requirements for the register of infrastructure**

The register of infrastructure shall:

- (a) provide the value of the parameters to be used to check the technical compatibility between vehicle and route;
- (b) provide relevant data to identify infrastructure characteristics of the intended area of use and facilitate the design of rolling stock and the feasibility check of train services;
- (c) enable Member States to include in the register of infrastructure rules and restrictions of a strictly local nature;
- (d) provide relevant data to facilitate the verification of the technical compatibility between a fixed subsystem and the network into which it is incorporated and to monitor the progress of interoperability of railway fixed installations;
- (e) provide the information necessary for the Route Book;
- (f) enable the use of the register of infrastructure as reference database for the network statement or other IT tools.

### 3. COMMON CHARACTERISTICS

The characteristics set out in this Annex shall be common to all registers of infrastructure of the Member States.

#### 3.1. Definitions

For the purposes of this Annex, the following definitions shall apply:

- (1) 'section of line' (SoL) means the part of line between adjacent operational points that may consist of several tracks;
- (2) 'operational point' (OP) means any location for train service operations, where train services may begin and end or change route and where passenger or freight services may be provided; it includes locations at boundaries between Member States or infrastructure managers;
- (3) 'location point' (LP) means any specific point on a track of a SoL where value of a parameter changes;
- (4) 'running track' means any track used for train service movements; it does not include passing loops and meeting loops on plain line or track connections only required for train operation;
- (5) 'siding' means any track within an operational point, which is not used for operational routing of a train.

#### 3.2. Railway network structure for the register of infrastructure

- 3.2.1. For the purposes of the register of infrastructure, each Member State shall describe its railway network by sections of line and operational points.
- 3.2.2. Items to be published for 'section of line' related to infrastructure, energy and track-side control-command and signalling subsystems shall be assigned to the infrastructure element 'running track'.
- 3.2.3. Items to be published for 'operational point' related to infrastructure subsystem shall be assigned to the infrastructure elements 'running track' and 'siding'.

#### 3.3. Items for the register of infrastructure

- 3.3.1. Items shall be published in accordance with Table 1.
- 3.3.2. The register of infrastructure application guide referred to in Article 7 shall specify the specific format and the governance process of the data listed in Table 1 presented in one of the following ways:
  - (a) a single or multiple selection from a predefined list;
  - (b) a CharacterString or the predefined CharacterString;
  - (c) a number indicated inside square brackets.
- 3.3.3. The value of a parameter shall be provided when it corresponds to a core parameter or when the corresponding item exists on the network that is described in accordance with the deadlines in Table 1.

Parameters required for checking the vehicle-route compatibility are indicated as 'Needed for RC' in accordance with Appendix D1 to Implementing Regulation (EU) 2019/773.

Any information relevant to the parameters is provided in Table 1.

When Table 1 refers to a document of the infrastructure manager, the infrastructure manager or the NRE in accordance with Article 5 shall submit such document to the Agency in an electronic format. Documents referred to in parameters 1.1.1.1.2.4.4, 1.1.1.1.6.4, 1.1.1.1.6.5, 1.1.1.3.7.1.3 and 1.1.1.3.11.3 shall be submitted in two EU languages.

Table 1

## Items for the register of infrastructure

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1	MEMBER STATE					
1.1	SECTION OF LINE					
1.1.0.0.0	Generic information					
1.1.0.0.0.1	Infrastructure manager (IM)'s code	[AAAA]	Infrastructure manager means anybody or undertaking that is responsible in particular for establishing and maintaining railway infrastructure or a part thereof.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.0.0.0.2	National line identification	CharacterString	Unique line identification or unique line number within Member State.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.0.0.0.3	Operational point at start of section of line	Predefined CharacterString	Unique OP ID at start of section of line (kilometres increasing from start OP to the end OP).	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.0.0.0.4	Operational point at end of section of line	Predefined CharacterString	Unique OP ID at end of section of line (kilometres increasing from start OP to the end OP)	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.0.0.0.5	Length of section of line	Predefined CharacterString	Length between operational points at start and end of section of line.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.0.0.0.6	Nature of Section of Line	Single selection from the predefined list: Regular SoL/Link	Kind of section of line expressing size of presented data which depends on fact whether it connects OPs generated by division of a big node into several OPs or not.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest



Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1	RUNNING TRACK					
1.1.1.0.0	Generic information					
1.1.1.0.0.1	Identification of track	CharacterString	Unique track identification or unique track number within section of line	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.0.0.2	Normal running direction	Single selection from the predefined list: N/O/B	The normal running direction is: — the same as the direction defined by the start and end of the SoL: (N) — the opposite to the direction defined by the start and end of the SoL: (O) — both directions: (B)	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1	Infrastructure subsystem					
1.1.1.1.1	Declarations of verification for track					
1.1.1.1.1.1	EC declaration of verification for track relating to compliance with the requirements from technical specifications for interoperability (TSIs) applicable to infrastructure subsystem	Predefined CharacterString: [CC/RRRRRRRRRRRRR/YYYY/NNNNNN]	Unique number for EC declarations in accordance with Commission Implementing Regulation (EU) 2019/250 (1).			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.1.2	EI declaration of demonstration (as defined Commission 2014/881/EU (2)) for track relating to compliance with the requirements from TSIs applicable to infrastructure subsystem	Predefined CharacterString: [CC/RRRRRRRRRRRRR/YYYY/NNNNNN]	Unique number for EI declarations following the same format requirements as specified for EC declarations in Annex VII of Commission Implementing Regulation (EU) 2019/250.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.2	Performance parameters					
1.1.1.1.2.1	Trans-European Network (TEN) classification of track	Single selection from a predefined list	Indication of the part of the trans-European network the line belongs to.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.1.2.1.2	TEN geographic information system identity (GIS ID)	CharacterString	Indication of the GIS ID of the section of TEN-T database to which the track belongs			1 January 2021
1.1.1.1.2.2	Category of line	Single selection from a predefined list	Classification of a line according to the INF TSI – Commission Regulation (EU) No 1299/2014 <sup>(3)</sup>	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.2.3	Part of a Railway Freight Corridor	Single selection from a predefined list	Indication whether the line is designated to a Railway Freight Corridor			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.2.4	Load capability	Single selection from a predefined list	A combination of the line category and speed at the weakest point of the track	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.2.4.1	National classification for load capability	CharacterString	National classification for load capability		X	16 January 2020
1.1.1.1.2.4.2	Compliance of structures with the High Speed Load Model (HSLM)	Single selection from the predefined list: Y/N	For sections of line with a maximum permitted speed of 200 km/h or more. Information regarding the procedure to be used to perform the dynamic compatibility check		X	16 January 2020
1.1.1.1.2.4.3	Railway location of structures requiring specific checks	Predefined CharacterString: [± NNNN.NNN] + [CharacterString]	Localisation of structures requiring specific checks		X	16 January 2020
1.1.1.1.2.4.4	Document with the procedure(s) for static and dynamic route compatibility checks	CharacterString	Electronic document available in two EU languages from the IM stored by the Agency with: — precise procedures for the static and dynamic route compatibility checks; Or — relevant information for carrying out the checks for specific structures.		X	16 January 2020

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.1.2.5	Maximum permitted speed	[NNN]	Nominal maximum operational speed on the line as a result of infrastructure, energy and control, command and signalling subsystem characteristics expressed in kilometres/hour.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.2.6	Temperature range	Single selection from the predefined list: T1 (-25 to +40) T2 (-40 to +35) T3 (-25 to +45) Tx (-40 to +50)	Temperature range for unrestricted access to the line according to European standard.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.2.7	Maximum altitude	[+/-][NNNN]	Highest point of the section of line above sea level in reference to Normal Amsterdam's Peil (NAP).	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.2.8	Existence of severe climatic conditions	Single selection from the predefined list: Y/N	Climatic conditions on the line are severe according to European standard.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.3	Line layout					
1.1.1.1.3.1	Interoperable gauge	Single selection from the predefined list: GA/GB./GC/G1/DE3/S/IRL1/ none	Gauges GA, GB, GC, G1, DE3, S, IRL1 as defined in European standard.			Parameter deleted. To be displayed for information
1.1.1.1.3.2	Multinational gauges	Single selection from the predefined list: G2/GB1/GB2/none	Multilateral gauge or international gauge other than GA, GB, GC, G1, DE3, S, IRL1 as defined in European standard.			Parameter deleted. To be displayed for information
1.1.1.1.3.3	National gauges	Single selection from a predefined list	Domestic gauge as defined in European standard or other local gauge.			Parameter deleted. To be displayed for information

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.1.3.1.1	Gauging	Single selection from a predefined list	Gauges as defined in European standard or other local gauges, including lower or upper part. In accordance with point 7.3.2.2 in Regulation (EU) No 1302/2014, sections of lines of the United Kingdom of Great Britain network may not have gauge reference profile.	X	X	16 January 2020
1.1.1.1.3.1.2	Railway location of particular points requiring specific checks	Predefined CharacterString: [± NNNN.NNN] + [CharacterString]	Location of particular points requiring specific checks due to deviations from gauging referred to in 1.1.1.1.3.1.1.		X	16 January 2020
1.1.1.1.3.1.3	Document with the transversal section of the particular points requiring specific checks	CharacterString	Electronic document available from the IM stored by the Agency with the transversal section of the particular points requiring specific checks due to deviations from gauging referred to in 1.1.1.1.3.1.1. Where relevant, guidance for the check with the particular point may be attached to the document with the transversal section.		X	16 January 2020
1.1.1.1.3.4	Standard combined transport profile number for swap bodies	Single selection from a predefined list	Coding for combined transport with swap bodies as defined in UIC Code (if the line belongs to the TEN).	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.3.5	Standard combined transport profile number for semi-trailers	Single selection from a predefined list	Coding for combined transport for semi-trailers as defined in UIC Code (if the line belongs to the TEN).	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.3.5.1	Specific information	CharacterString	Any relevant information from the IM relating to the line layout			1 January 2021
1.1.1.1.3.6	Gradient profile	Predefined CharacterString: [± NN.N] ([± NNNN.NNN] repeated as many times as necessary	Sequence of gradient values and locations of change in gradient	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.1.3.7	Minimum radius of horizontal curve	[NNNNN]	Radius of the smallest horizontal curve of the track in metres.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.4	Track parameters					
1.1.1.1.4.1	Nominal track gauge	Single selection from the predefined list 750/1000/1435/1520/1524/ 1600/1668/other	A single value expressed in millimetres that identifies the track gauge.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.4.2	Cant deficiency	[+/-] [NNN]	Maximum cant deficiency expressed in millimetres defined as difference between the applied cant and a higher equilibrium cant the line has been designed for.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.4.3	Rail inclination	[NN]	An angle defining the inclination of the head of a rail relative to the running surface	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.4.4	Existence of ballast	Single selection from the predefined list: Y/N	Specifies whether track construction is with sleepers embedded in ballast or not.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.5	Switches and crossings					
1.1.1.1.5.1	TSI compliance of in service values for switches and crossings	Single selection from the predefined list: Y/N	Switches and crossings are maintained to in service limit dimension as specified in TSI.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.5.2	Minimum wheel diameter for fixed obtuse crossings	[NNN]	Maximum unguided length of fixed obtuse crossings is based on a minimum wheel diameter in service expressed in millimetres.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.1.6	Track resistance to applied loads					
1.1.1.1.6.1	Maximum train deceleration	[N.N]	Limit for longitudinal track resistance given as a maximum allowed train deceleration and expressed in metres per square second.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.6.2	Use of eddy current brakes	Single selection from the predefined list: Allowed/allowed under conditions/allowed only for emergency brake/allowed under conditions only for emergency brake/not allowed	Indication of limitations on the use of eddy current brakes.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.6.3	Use of magnetic brakes	Single selection from the predefined list: Allowed/allowed under conditions/allowed under conditions only for emergency brake/allowed only for emergency brake/not allowed	Indication of limitations on the use of magnetic brakes.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.6.4	Document with the conditions for the use of eddy current brakes	CharacterString	Electronic document available in two EU languages from the IM stored by the Agency with conditions for the use of eddy current brakes identified in 1.1.1.1.6.2.		X	16 January 2020
1.1.1.1.6.5	Document with the conditions for the use of magnetic brakes	CharacterString	Electronic document available in two EU languages from the IM stored by the Agency with conditions for the use of magnetic brakes identified in 1.1.1.1.6.3.		X	16 January 2020

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.1.7	Health, safety and environment					
1.1.1.1.7.1	Use of flange lubrication forbidden	Single selection from the predefined list: Y/N	Indication whether the use of on-board device for flange lubrication is forbidden.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.7.2	Existence of level crossings	Single selection from the predefined list: Y/N	Indication whether level crossings (including pedestrian track crossing) exist on the section of line.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.7.3	Acceleration allowed near level crossing	CharacterString	Existence of limit for acceleration of train if stopping or recovering speed close to a level crossing expressed in a specific reference acceleration curve.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.7.4	Existence of trackside hot axle box detector (HABD)	Single selection from the predefined list: Y/N	Existence of trackside HABD	X	X	16 January 2020
1.1.1.1.7.5	Trackside HABD TSI compliant	Single selection from the predefined list: Y/N	Specific for the French, Italian and Swedish networks. Trackside hot axle box detector TSI compliant.		X	16 January 2020
1.1.1.1.7.6	Identification of trackside HABD	CharacterString	Specific for the French, Italian and Swedish networks. Applicable if trackside HABD is not TSI compliant, identification of trackside hot axle box detector.		X	16 January 2020
1.1.1.1.7.7	Generation of trackside HABD	Single selection from a predefined list	Specific for the French Italian and Swedish networks. Generation of trackside hot axle box detector.		X	16 January 2020

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.1.7.8	Railway location of trackside HABD	Predefined CharacterString: [± NNNN.NNN] + [Character-String]	Specific for the French Italian and Swedish networks. Applicable if trackside HABD is not TSI compliant, localisation of trackside hot axle box detector.		X	16 January 2020
1.1.1.1.7.9	Direction of measurement of trackside HABD	Single selection from the predefined list: N/O/B	Specific for the French Italian and Swedish networks. Applicable if trackside HABD is not TSI compliant, direction of measurement of trackside hot axle box detector. If the direction of measurement is: — the same as the direction defined by the start and end of the SoL: (N) — the opposite to the direction defined by the start and end of the SoL: (O) — both directions: (B)		X	16 January 2020
1.1.1.1.7.10	Steady red lights required	Single selection from the predefined list: Y/N	Sections where two steady red lights are required in accordance with Implementing Regulation (EU) 2019/773			1 January 2021
1.1.1.1.7.11	Belonging to a quieter route	Single selection from the predefined list: Y/N	Belonging to a 'quieter route' in accordance with Article 5b of Commission Regulation (EU) No 1304/2014 (*).	X		1 January 2021
1.1.1.1.8	Tunnel					
1.1.1.1.8.1	IM's code	[AAAA]	Infrastructure Manager means anybody or undertaking that is responsible in particular for establishing and maintaining railway infrastructure or a part thereof.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest



Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.1.8.2	Tunnel identification	CharacterString	Unique tunnel identification or unique number within Member State	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.8.3	Start of tunnel	Predefined CharacterString: [Latitude (NN.NNNN) + Longitude ( $\pm$ NN.NNNN) + km ( $\pm$ N NNN.NNN)]	Geographical coordinates in decimal degrees and km of the line at the beginning of a tunnel.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.8.4	End of tunnel	Predefined CharacterString: [Latitude (NN.NNNN) + Longitude ( $\pm$ NN.NNNN) + km ( $\pm$ N NNN.NNN)]	Geographical coordinates in decimal degrees and km of the line at the end of a tunnel.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.8.5	EC declaration of verification relating to compliance with the requirements from TSIs applicable to railway tunnel	Predefined CharacterString: [CC/RRRRRRRRRRRRR/YYYY/NNNNNN]	Unique number for EC declarations in accordance with Commission Implementing Regulation (EU) 2019/250.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.8.6	EI declaration of demonstration (as defined in Recommendation 2014/881/EU) relating to compliance with the requirements from TSIs applicable to railway tunnel	Predefined CharacterString: [CC/RRRRRRRRRRRRR/YYYY/NNNNNN]	Unique number for EI declarations following the same format requirements as specified for EC declarations in Annex VII of Commission Implementing Regulation (EU) 2019/250.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.8.7	Length of tunnel	[NNNNN]	Length of a tunnel in metres from entrance portal to exit portal.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.8.8	Cross section area	[NNN]	Smallest cross section area in square metres of the tunnel			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.8.8.1	Compliance of the tunnel with INF TSI	Y/N	compliance of the tunnel with INF TSI at the maximum permitted speed	X		1 January 2021

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.1.8.8.2	Document available from the IM with precise description of the tunnel	CharacterString	Electronic document available from the IM stored by the Agency with precise description of the clearance gauge and geometry of the tunnel			1 January 2021
1.1.1.1.8.9	Existence of emergency plan	Single selection from predefined list: Y/N	Indication whether emergency plan exists.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.8.10	Fire category of rolling stock required	Single selection from the predefined list: A/B/none	Categorisation on how a passenger train with a fire on board will continue to operate for a defined time period.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.1.8.11	National fire category of rolling stock required	CharacterString	Categorisation on how a passenger train with a fire on board will continue to operate for a defined time period.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2	Energy subsystem					
1.1.1.2.1	Declarations of verification for track					
1.1.1.2.1.1	EC declaration of verification for track relating to compliance with the requirements from TSIs applicable to energy subsystem	Predefined CharacterString: [CC/RRRRRRRRRRRRR/ YYYY/NNNNNN]	Unique number for EC declarations in accordance with Commission Implementing Regulation (EU) 2019/250.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2.1.2	EI declaration of demonstration (as defined Recommendation 2014/881/EU) for track relating to compliance with the requirements from TSIs applicable to energy subsystem	Predefined CharacterString: [CC/RRRRRRRRRRRRR/ YYYY/NNNNNN]	Unique number for EI declarations following the same format requirements as specified for EC declarations in Annex VII of Commission Implementing Regulation (EU) 2019/250.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.2.2	Contact line system					
1.1.1.2.2.1.1	Type of contact line system	Single selection from the predefined list: Overhead contact line (OCL) Third Rail Fourth Rail Not electrified	Indication of the type of the contact line system.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2.2.1.2	Energy supply system (Voltage and frequency)	Single selection from the predefined list: AC 25kV-50Hz/ AC 15kV-16.7 Hz/ DC 3kV/ DC 1.5 kV/ DC (Specific Case FR)/ DC 750V/ DC 650V/ DC 600V/ other	Indication of the traction supply system (nominal voltage and frequency)	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2.2.1.3	U <sub>max2</sub> for lines referred to in point 7.4.2.2.1 of Regulation (EU) No 1301/2014.	[NNNNNN]	Specific for the French network Highest non-permanent voltage according to EN50163 for the lines referred to in point 7.4.2.2.1 of Regulation (EU) No 1301/2014.		X	16 January 2020
1.1.1.2.2.2	Maximum train current	[NNNN]	Indication of the maximum allowable train current expressed in amperes.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2.2.3	Maximum current at standstill per pantograph	[NNN]	Indication of the maximum allowable train current at standstill for DC systems expressed in amperes.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.2.2.4	Permission for regenerative braking	Single selection from the predefined list: Y/N/Only if the vehicle is able to detect emergency shutdown in accordance with EN 50 388	Indication whether regenerative braking is permitted, not permitted, or permitted under specific conditions.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2.2.5	Maximum contact wire height	[N.NN]	Indication of the maximum contact wire height expressed in metres.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2.2.6	Minimum contact wire height	[N.NN]	Indication of the minimum contact wire height expressed in metres.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2.3	Pantograph					
1.1.1.2.3.1	Accepted TSI compliant pantograph heads	Single selection from a predefined list	Indication of TSI compliant pantograph heads which are allowed to be used.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2.3.2	Accepted other pantograph heads	Single selection from a predefined list	Indication of pantograph heads which are allowed to be used		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2.3.3	Requirements for number of raised pantographs and spacing between them, at the given speed	Predefined CharacterString: [N] [NNN] [NNN]	Indication of maximum number of raised pantographs per train allowed and minimum spacing centre line to centre line of adjacent pantograph heads, expressed in metres, at the given speed.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2.3.4	Permitted contact strip material	Single selection from a predefined list	Indication of which contact strip materials are permitted to be used.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.2.4	OCL separation sections					
1.1.1.2.4.1.1	Phase separation	Single selection from predefined list: Y/N	Indication of existence of phase separation and required information.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2.4.1.2	Information on phase separation	Predefined CharacterString	Indication of required several information on phase separation			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2.4.2.1	System separation	Single selection from the predefined list: Y/N	Indication of existence of system separation			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2.4.2.2	Information on system separation	Predefined CharacterString	Indication of required several information on system separation			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2.4.3	Distance between signboard and phase separation ending	[N]	Specific for route compatibility check on French network.  Distance between the signboard authorizing the driver to 'raise pantograph' or 'close the circuit breaker' after passing the phase separation and the end of the phase separation section.		X	16 January 2020
1.1.1.2.5	Requirements for rolling stock					
1.1.1.2.5.1	Current or power limitation on board required	Single selection from the predefined list: Y/N	Indication of whether an on board current or power limitation function on vehicles is required.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.2.5.2	Contact force permitted	CharacterString	Indication of contact force allowed expressed in newton.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.2.5.3	Automatic dropping device required	Single selection from the predefined list: Y/N	Indication of whether an automatic dropping device (ADD) required on the vehicle.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3	Control — command and signalling subsystem					
1.1.1.3.1	Declarations of verification for track					
1.1.1.3.1.1	EC declaration of verification for track relating to compliance with the requirements from TSIs applicable to control, command signalling subsystem	Predefined CharacterString: [CC/RRRRRRRRRRRRRRR/ YYYY/NNNNNN]	Unique number for EC declarations in accordance with Commission Implementing Regulation (EU) 2019/250.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.2	TSI compliant train protection system (ETCS)					
1.1.1.3.2.1	European Train Control System (ETCS) level	Single selection from a predefined list	ETCS application level related to the track side equipment.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.2.2	ETCS baseline	Single selection from a predefined list	ETCS baseline installed lineside.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.2.3	ETCS infill necessary for line access	Single selection from the predefined list: Y/N	Indication whether infill is required to access the line for safety reasons.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.2.4	ETCS infill installed line-side	Single selection from the predefined list: None/Loop/GSM-R infill/Loop & GSM-R infill	Information about installed trackside equipment capable to transmit infill information by loop or Global System for Mobile communications for Railways (GSM-R) for level 1 installations.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.3.2.5	ETCS national packet 44 application implemented	Single selection from the predefined list: Y/N	Indication whether data for national applications is transmitted between track and train.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.2.6	Existence of operating restrictions or conditions	Single selection from the predefined list: Y/N	Indication whether restrictions or conditions due to partial compliance with the CCS TSI – Commission Regulation (EU) 2016/919 <sup>(5)</sup> exist.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.2.7	Optional ETCS functions	CharacterString	Optional ETCS functions which might improve operation on the line.	Parameter deleted. To be displayed for information		
1.1.1.3.2.8	Train integrity confirmation from on-board necessary for line access	Single selection from the predefined list: Y/N	Indication whether train confirmation from on-board is required to access the line for safety reasons.		X	16 January 2020
1.1.1.3.2.9	ETCS system compatibility	Single selection from a predefined list	ETCS requirements used for demonstrating technical compatibility		X	16 January 2020
1.1.1.3.2.10	ETCS M_version	Single selection from a predefined list	ETCS M_version according to SRS 7.5.1.9			1 January 2021
1.1.1.3.3	TSI compliant radio (GSM-R)					
1.1.1.3.3.1	GSM-R version	Single selection from a predefined list	GSM-R functional requirements specification (FRS) and system requirements specification (SRS) version number installed lineside.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.3.3.2	Number of active GSM-R mobiles (EDOR) or simultaneous communication session on board for ETCS level 2 or level 3 needed to perform radio block centre handovers without having an operational disruption	Single selection from the predefined list: 1/2	Number of simultaneous communication session on board for ETCS level 2 or level 3 required for a smooth running of the train. This relates to the radio block centre (RBC) handling of communication sessions. Not safety critical and no matter of interoperability.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.3.3	Optional GSM-R functions	Single selection from a predefined list	Use of optional GSM-R functions which might improve operation on the line. They are for information only and not for network access criteria.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.3.3.1	Additional information on network characteristics	Characterstring	Any additional information on network characteristics or corresponding document available from the IM and stored by the Agency, e.g.; interference level, leading to the recommendation of additional on-board protection			1 January 2021
1.1.1.3.3.3.2	GPRS for ETCS	Selection from the predefined list: Y/N	Indication if GPRS can be used for ETCS			1 January 2021
1.1.1.3.3.3.3	Area of implementation of GPRS	CharacterString	Indication of the area in which GPRS can be used for ETCS			1 January 2021
1.1.1.3.3.4	Use of group 555	Selection from the predefined list: Y/N	Indication if group 555 is used		X	16 January 2020
1.1.1.3.3.5	GSM-R networks covered by a roaming agreement	Single selection from a predefined list	List of GSM-R networks which are covered by a roaming agreement		X	16 January 2020



Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.3.3.6	Existence of Roaming to public networks	Selection from the predefined list: Y/N In case of Y, provide the name of the public network:	Existence of roaming to a public networks			1 January 2021
1.1.1.3.3.7	Details on roaming to public networks	Character string	If roaming to public networks is configured, please indicate to which networks, for which users and in which areas.			1 January 2021
1.1.1.3.3.8	No GSMR coverage	selection from the predefined list: Y/N	Indication if there is a no GSMR coverage	X		1 January 2021
1.1.1.3.3.9	Radio system compatibility voice	Single selection from a predefined list	Radio requirements used for demonstrating technical compatibility voice		X	16 January 2020
1.1.1.3.3.10	Radio system compatibility data	Single selection from a predefined list	Radio requirements used for demonstrating technical compatibility data		X	16 January 2020
1.1.1.3.4	Train detection systems fully compliant with the TSI					
1.1.1.3.4.1	Existence of train detection system fully compliant with the TSI:	Single selection from the predefined list: Y/N	Indication if there is any train detection system installed and fully compliant with the CCS TSI — Regulation (EU) 2016/919 requirements.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.5	Train protection legacy systems					
1.1.1.3.5.1	Existence of other train protection, control and warning systems installed Train protection system	Single selection from the predefined list: Y/N	Indication if other train protection, control and warning systems in normal operation are installed lineside.	Parameter deleted. To be displayed for information		

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.3.5.2	Need for more than one train protection, control and warning system required on-board	Single selection from the predefined list	Indication whether more than one train protection, control and warning system is required to be on-board and active simultaneously.	Parameter deleted. To be displayed for information		
1.1.1.3.5.3	Train protection legacy system	Single selection from the predefined list	Indication of which class B system is installed	X	X	16 January 2020
1.1.1.3.6	Radio Legacy Systems					
1.1.1.3.6.1	Other radio systems installed (Radio Legacy Systems)	Single selection from the predefined list	Indication of radio legacy systems installed.	X	X	16 January 2020
1.1.1.3.7	Train detection systems not fully compliant with the TSI					
1.1.1.3.7.1.1	Type of train detection system	Single selection from the predefined list: track circuit/wheel detector/loop	Indication of types of train detection systems installed.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.1.2	Type of track circuits or axle counters to which specific checks are needed	Single selection from the predefined list	Indication of types of train detection systems to which specific checks are needed.		X	16 January 2020
1.1.1.3.7.1.3	Document with the procedure(s) related to the type of train detection systems declared in 1.1.1.3.7.1.2	CharacterString	Electronic document available in two EU languages from the IM stored by the Agency with precise procedures for the specific check to be performed for train detection systems identified in 1.1.1.3.7.1.2.		X	16 January 2020

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.3.7.1.4	Section with train detection limitation	Single selection from the predefined list: Y/N	Specific for route compatibility check on French network. Sections with: — Tonnage circulated per track is inferior to 15 000 tons/day/track — Directional Interlocking — 45-second delay for directional interlocking — Installation with track circuit announcement — Absence of a shunting assistance pedal in the normal direction of circulation for non-reversible double track lines — Absence of a shunting assistance pedal regardless of the direction of traffic for single track lines and tracks for two way working — Absence of a pedal announcement mechanism — 45-second delay for specific announcement reset devices		X	16 January 2020
1.1.1.3.7.2.1	TSI compliance of maximum permitted distance between two consecutive axles	Single selection from the predefined list: TSI compliant/TSI not compliant	Indication whether required distance is compliant with the TSI.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.2.2	Maximum permitted distance between two consecutive axles in case of TSI non-compliance	[NNNNN]	Indication of maximum permitted distance between two consecutive axles in case of TSI non-compliance, given in millimetres.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.3	Minimum permitted distance between two consecutive axles	[NNNN]	Indication of distance given in millimetres.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.3.7.4	Minimum permitted distance between first and last axle	[NNNNN]	Indication of distance given in millimetres.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.5	Maximum distance between end of train and first axle	[NNNN]	Indication of maximum distance between end of train and first axle given in millimetres applicable for both sides (front and rear) of a vehicle or train.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.6	Minimum permitted width of the rim	[NNN]	Indication of width given in millimetres.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.7	Minimum permitted wheel diameter	[NNN]	Indication of wheel diameter given in millimetres.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.8	Minimum permitted thickness of the flange	[NN.N]	Indication of flange thickness given in millimetres.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.9	Minimum permitted height of the flange	[NN.N]	Indication of height of flange given in millimetres.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.10	Maximum permitted height of the flange	[NN.N]	Indication of height of flange given in millimetres.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.11	Minimum permitted axle load	[NN.N]	Indication of load given in tons.	Parameter deleted. To be displayed for information		
1.1.1.3.7.11.1	Minimum permitted axle load per category of vehicle	Single selection from a predefined list	Indication of load given in tons depending of the category of vehicle.			1 January 2021
1.1.1.3.7.12	TSI compliance of rules for metal-free space around wheels	Single selection from the predefined list: TSI compliant/not TSI compliant	Indication whether rules are compliant with the TSI.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.3.7.13	TSI compliance of rules for vehicle metal construction	Single selection from the predefined list: TSI compliant/not TSI compliant	Indication whether rules are compliant with the TSI.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.14	TSI compliance of ferromagnetic characteristics of wheel material required	Single selection from the predefined list: TSI compliant/not TSI compliant	Indication whether rules are compliant with the TSI.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.15.1	TSI compliance of maximum permitted impedance between opposite wheels of a wheelset	Single selection from the predefined list: TSI compliant/not TSI compliant	Indication whether rules are compliant with the TSI.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.15.2	Maximum permitted impedance between opposite wheels of a wheelset when not TSI compliant	[N.NNN]	The value of maximum permitted impedance given in ohm in case of TSI non-compliance			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.16	TSI compliance of sanding	Single selection from predefined list: TSI compliant/not TSI compliant	Indication whether rules are compliant with the TSI or not	Parameter deleted. To be displayed for information		
1.1.1.3.7.17	Maximum amount of sand	Single selection from a predefined list	Maximum amount of sand within 30s given in grams accepted on the track			1 January 2021
1.1.1.3.7.18	Sanding override by driver required	Single selection from the predefined list: Y/N	Indication whether possibility to activate/deactivate sanding devices by driver, according to instructions from the Infrastructure Manager, is required or not.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.19	TSI Compliance of rules on sand characteristics	Single selection from the predefined list: TSI compliant/not TSI compliant	Indication whether rules are compliant with the TSI.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.3.7.20	Existence of rules on on-board flange lubrication	Single selection from the predefined list: Y/N	Indication whether rules for activation or deactivation of flange lubrication exist.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.21	TSI compliance of rules on the use of composite brake blocks	Single selection from the predefined list: TSI compliant/not TSI compliant	Indication whether rules are compliant with the TSI.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.22	TSI compliance of rules on shunt assisting devices	Single selection from the predefined list: TSI compliant/not TSI compliant	Indication whether rules are compliant with the TSI.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.7.23	TSI compliance of rules on combination of RST characteristics influencing shunting impedance	Single selection from the predefined list: TSI compliant/not TSI compliant	Indication whether rules are compliant with the TSI.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.8	Transitions between systems					
1.1.1.3.8.1	Existence of switch over between different protection, control and warning systems while running	Single selection from the predefined list: Y/N	Indication whether a switch over between different systems whilst running exist			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.8.2	Existence of switch over between different radio systems	Single selection from the predefined list: Y/N	Indication whether a switch over between different radio systems and no communication system whilst running exist			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.9	Parameters related to electromagnetic interferences					
1.1.1.3.9.1	Existence and TSI compliance of rules for magnetic fields emitted by a vehicle	Single selection from the predefined list: none/TSI compliant/not TSI compliant	Indication whether rules exist and are compliant with the TSI.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.3.9.2	Existence and TSI compliance of limits in harmonics in the traction current of vehicles	Single selection from the predefined list: none/TSI compliant/not TSI compliant	Indication whether rules exist and are compliant with the TSI.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.10	Line-side system for degraded situation					
1.1.1.3.10.1	ETCS level for degraded situation	Single selection from a predefined list	ERTMS/ETCS application level for degraded situation related to the track side equipment.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.10.2	Other train protection, control and warning systems for degraded situation	Single selection from a predefined list	Indication of existence of other system than ETCS for degraded situation.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.11	Brake related parameters					
1.1.1.3.11.1	Maximum braking distance requested	[NNNN]	The maximum value of the braking distance [in metres] of a train shall be given for the maximum line speed.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.1.1.3.11.2	Availability by the IM of additional information	Single selection from the predefined list: Y/N	Availability by the IM of additional information as defined in point (2) of point 4.2.2.6.2 of the Annex to Regulation (EU) 2019/773	X	X	16 January 2020
1.1.1.3.11.3	Documents available by the IM relating to braking performance	CharacterString	Electronic document available in two EU languages from the IM stored by the Agency providing additional information as defined in point (2) of point 4.2.2.6.2 of the Annex to Implementing Regulation (EU) 2019/773.		X	16 January 2020

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.1.1.3.12	Other CCS related parameters					
1.1.1.3.12.1	Tilting supported	Single selection from the predefined list: Y/N	Indication whether tilting functions are supported by ETCS.	Parameter deleted. To be displayed for information		
1.1.1.4	Rules and restrictions					
1.1.1.4.1	Existence of rules and restrictions of a strictly local nature	Single selection from the predefined list: Y/N	Existence of rules and restrictions of a strictly local nature			1 January 2021
1.1.1.4.2	Documents regarding the rules or restrictions of a strictly local nature available by the IM	CharacterString	Electronic document available from the IM stored by the Agency providing additional information			1 January 2021
1.2	OPERATIONAL POINT					
1.2.0.0.0	Generic information					
1.2.0.0.0.1	Name of operational point	CharacterString	Name normally related to the town or village or to traffic control purpose	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.0.0.0.2	Unique OP ID	Predefined CharacterString: [AA+AAAAAAAAAA]	Code composed of country code and alphanumeric OP code.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.0.0.0.3	OP TAF TAP primary code	Predefined CharacterString: [AANNNNN]	Primary code developed for TAF/TAP.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.0.0.0.4	Type of operational point	Single selection from a predefined list	Type of facility in relation to the dominating operational functions.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest



Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.2.0.0.0.4.1	Type of track gauge changeover facility	CharacterString	Type of track gauge changeover facility		X	16 January 2020
1.2.0.0.0.5	Geographical location of operational point	Predefined CharacterString: [Latitude (NN.NNNN) + Longitude (± NN.NNNN)]	Geographical coordinates in decimal degrees normally given for the centre of the OP.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.0.0.0.6	Railway location of Operational point	Predefined CharacterString: [NNN.NNN] + [CharacterString]	Kilometre related to line identification defining the location of the OP. This will normally be in the centre of the OP.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1	RUNNING TRACK					
1.2.1.0.0	Generic information					
1.2.1.0.0.1	IM's code	[AAAA]	Infrastructure manager means any body or undertaking that is responsible in particular for establishing and maintaining railway infrastructure or a part thereof.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.0.2	Identification of track	CharacterString	Unique track identification or unique track number within OP	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.1	Declarations of verification for track					
1.2.1.0.1.1	EC declaration of verification for track relating to compliance with the requirements from TSIs applicable to infrastructure subsystem	Predefined CharacterString: [CC/RRRRRRRRRRRRRR/YYY/NNNNNN]	Unique number for EC declarations in accordance with Commission Implementing Regulation (EU) 2019/250.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.1.2	EI declaration of demonstration (as defined Recommendation 2014/881/EU) relating to compliance with the requirements from TSIs applicable to infrastructure subsystem	Predefined CharacterString: [CC/RRRRRRRRRRRRRR/YYY/NNNNNN]	Unique number for EI declarations following the same format requirements as specified for EC declarations in Annex VII of Commission Implementing Regulation (EU) 2019/250.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.2.1.0.2	Performance parameters					
1.2.1.0.2.1	TEN classification of track	Single selection from the predefined list: Part of the TEN-T Comprehensive Network/Part of the TEN-T Core Freight Network/Part of the TEN-T Core Passenger Network/Off-TEN	Indication of the part of the trans-European network the track belongs to.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.2.2	Category of line:	Single selection from a predefined list	Classification of a line according to the INF TSI — Regulation (EU) No 1299/2014.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.2.3	Part of a Railway Freight Corridor	Single selection from a predefined list	Indication whether the line is designated to a Railway Freight Corridor			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.3	Line layout					
1.2.1.0.3.1	Interoperable gauge	Single selection from the predefined list: GA/GB/GC/G1/DE3/S/IRL1/none	Gauges GA, GB, GC, G1, DE3, S, IRL1 as defined in European standard.	Parameter deleted. To be displayed for information		
1.2.1.0.3.2	Multinational gauges:	Single selection from the predefined list: G2/GB1/GB2/none	Multilateral gauge or international gauge other than GA, GB, GC, G1, DE3, S, IRL1 as defined in European standard.	Parameter deleted. To be displayed for information		
1.2.1.0.3.3	National gauges	Single selection from a predefined list	Domestic gauge as defined in European standard or other local gauge.	Parameter deleted. To be displayed for information		
1.2.1.0.3.4	Gauging	Single selection from a predefined list	Gauges as defined in European standard or other local gauges, including lower or upper part.	X	X	16 January 2020

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.2.1.0.3.5	Railway location of particular points requiring specific checks	Predefined CharacterString: [± NNNN.NNN] + [Character-String]	Location of particular points requiring specific checks due to deviations from gauging referred to in 1.2.1.0.3.4.		X	16 January 2020
1.2.1.0.3.6	Document with the transversal section of the particular points requiring specific checks	CharacterString	Electronic document available from the IM stored by the Agency with the transversal section of the particular points requiring specific checks due to deviations from gauging referred to in 1.2.1.0.3.4. Where relevant, guidance for the check with the particular point may be attached to the document with the transversal section.		X	16 January 2020
1.2.1.0.4	Track parameters					
1.2.1.0.4.1	Nominal track gauge	Single selection from the predefined list: 750/1000/1435/1520/1524/ 1600/1668/other	A single value expressed in millimetres that identifies the track gauge.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.5	Tunnel					
1.2.1.0.5.1	IM's code	[AAAA]	Infrastructure manager means any body or undertaking that is responsible in particular for establishing and maintaining railway infrastructure or a part thereof.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.5.2	Tunnel identification	CharacterString	Unique tunnel identification or unique tunnel number within MS	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.5.3	EC declaration of verification for tunnel relating to compliance with the requirements from TSIs applicable to railway tunnel	CharacterString: [CC/RRRRRRRRRRRRR/ YYYY/NNNNNN]	Unique number for EC declarations in accordance with Commission Implementing Regulation (EU) 2019/250.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.2.1.0.5.4	EI declaration of demonstration (as defined Recommendation 2014/881/EU) for tunnel relating to compliance with the requirements from TSIs applicable to railway tunnel	Predefined CharacterString: [CC/RRRRRRRRRRRRRRR/ YYYY/NNNNNN]	Unique number for EI declarations following the same format requirements as specified for EC declarations in Annex VII of Commission Implementing Regulation (EU) 2019/250.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.5.5	Length of tunnel	[NNNNN]	Length of a tunnel in metres from entrance portal to exit portal.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.5.6	Existence of emergency plan	Single selection from the predefined list: Y/N	Indication whether emergency plan exists.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.5.7	Fire category of rolling stock required	Single selection from the predefined list: A/B/none	Categorisation how a passenger train with a fire on board will continue to operate for a defined time period		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.5.8	National fire category of rolling stock required	CharacterString	Categorisation how a passenger train with a fire on board will continue to operate for a defined time period — according to national rules if they exist		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.5.9	Diesel or other thermal traction allowed	Single selection from the predefined list: Y/N	Indication whether it is allowed to use diesel or other thermal traction in the tunnel			1 January 2021
1.2.1.0.6	Platform					
1.2.1.0.6.1	IM's code	[AAAA]	Infrastructure manager means any body or undertaking that is responsible in particular for establishing and maintaining railway infrastructure or a part thereof.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.2.1.0.6.2	Identification of platform	CharacterString	Unique platform identification or unique platform number within OP	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.6.3	TEN Classification of platform	Single selection from the predefined list: Part of the TEN-T Comprehensive Network/Part of the TEN-T Core Freight Network/Part of the TEN-T Core Passenger Network/Off-TEN	Indicates the part of the trans-European network the platform belongs to.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.6.4	Usable length of platform	[NNNN]	The maximum continuous length (expressed in metres) of that part of platform in front of which a train is intended to remain stationary in normal operating conditions for passengers to board and alight from the train, making appropriate allowance for stopping tolerances.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.6.5	Height of platform	Single selection from the predefined list: 250/280/550/760/300-380/ 200/580/680/685/730/840/ 900/915/920/960/1100/other	Distance between the upper surface of platform and running surface of the neighbouring track. It is the nominal value expressed in millimetres.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.6.6	Existence of platform assistance for starting train	Single selection from the predefined list: Y/N	Indication of existence of equipment or staff supporting the train crew in starting the train.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.1.0.6.7	Range of use of the platform boarding aid	[NNNN]	Information of the train access level for which the boarding aid can be used.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.2.2	SIDING					
1.2.2.0.0	Generic information					
1.2.2.0.0.1	IM's code	[AAAA]	Infrastructure manager means any body or undertaking that is responsible in particular for establishing and maintaining railway infrastructure or a part thereof.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.0.2	Identification of siding	CharacterString	Unique siding identification or unique siding number within OP	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.0.3	TEN Classification of siding	Single selection from the predefined list: Part of the TEN-T Comprehensive Network/Part of the TEN-T Core Freight Network/Part of the TEN-T Core Passenger Network/Off-TEN	Indicates the part of the trans-European network the siding belongs to.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.1	Declaration of verification for siding					
1.2.2.0.1.1	EC declaration of verification for siding relating to compliance with the requirements from TSIs applicable to infrastructure subsystem	Predefined CharacterString: [CC/RRRRRRRRRRRRR/ YYYY/NNNNNN]	Unique number for EC declarations in accordance with Commission Implementing Regulation (EU) 2019/250.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.1.2	EI declaration of demonstration (as defined Recommendation 2014/881/EU) for siding relating to compliance with the requirements from TSIs applicable to infrastructure subsystem	Predefined CharacterString: [CC/RRRRRRRRRRRRR/ YYYY/NNNNNN]	Unique number for EI declarations following the same format requirements as specified for EC declarations in Annex VII of Commission Implementing Regulation (EU) 2019/250.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.2.2.0.2	Performance parameter					
1.2.2.0.2.1	Usable length of siding	[NNNN]	Total length of the siding/stabling track expressed in metres where trains can be parked safely.	X	X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.3	Line layout					
1.2.2.0.3.1	Gradient for stabling tracks	[NN.N]	Maximum value of the gradient expressed in millimetres per metre.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.3.2	Minimum radius of horizontal curve	[NNN]	Radius of the smallest horizontal curve, expressed in metres.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.3.3	Minimum radius of vertical curve	[NNN+NNN]	Radius of the smallest vertical curve expressed in metres.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.4	Fixed installations for servicing trains					
1.2.2.0.4.1	Existence of toilet discharge	Single selection from the predefined list: Y/N	Indication whether exists an installation of toilet discharge (fixed installation for servicing trains) as defined in INF TSI — Regulation (EU) No 1299/2014.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.4.2	Existence of external cleaning facilities	Single selection from the predefined list: Y/N	Indication whether exists an installation of external cleaning facility (fixed installation for servicing trains) as defined in INF TSI — Regulation (EU) No 1299/2014.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.4.3	Existence of water restocking	Single selection from the predefined list: Y/N	Indication whether exists an installation of water restocking (fixed installation for servicing trains) as defined in INF TSI — Regulation (EU) No 1299/2014.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.2.2.0.4.4	Existence of refuelling	Single selection from the predefined list: Y/N	Indication whether exists an installation of refuelling (fixed installation for servicing trains) as defined in INF TSI — Regulation (EU) No 1299/2014.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.4.5	Existence of sand restocking	Single selection from the predefined list: Y/N	Indication whether an installation of sand restocking exists (fixed installation for servicing trains).	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.4.6	Existence of electric shore supply	Single selection from the predefined list: Y/N	Indication whether exists an installation of electric shore supply (fixed installation for servicing trains).	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.5	Tunnel					
1.2.2.0.5.1	IM's code	[AAAA]	Infrastructure manager means any body or undertaking that is responsible in particular for establishing and maintaining railway infrastructure or a part thereof.	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.5.2	Tunnel identification	CharacterString	Unique tunnel identification or unique number within Member State	X		In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.5.3	EC declaration of verification for tunnel relating to compliance with the requirements from TSIs applicable to railway tunnel	Predefined CharacterString: [CC/RRRRRRRRRRRRR/ YYYY/NNNNNN]	Unique number for EC declarations in accordance with Commission Implementing Regulation (EU) 2019/250.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.5.4	EI declaration of demonstration (as defined Recommendation 2014/881/EU) for tunnel relating to compliance with the requirements from TSIs applicable to railway tunnel	Predefined CharacterString: [CC/RRRRRRRRRRRRR/ YYYY/NNNNNN]	Unique number for EI declarations following the same format requirements as specified for EC declarations in Annex VII of Commission Implementing Regulation (EU) 2019/250.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest



Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.2.2.0.5.5	Length of tunnel	[NNNNN]	Length of a tunnel in metres from entrance portal to exit portal.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.5.6	Existence of emergency plan	Single selection from the predefined list: Y/N	Indication whether emergency plan exists.			In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.5.7	Fire category of rolling stock required	Single selection from the predefined list: A/B/none	Categorisation how a passenger train with a fire on board will continue to operate for a defined time period.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.5.8	National fire category of rolling stock required	CharacterString	Categorisation how a passenger train with a fire on board will continue to operate for a defined time period — according to national rules if they exist.		X	In accordance with Implementing Decision 2014/880/EU and by 16 March 2019 at the latest
1.2.2.0.6	Contact line system					
1.2.2.0.6.1	Maximum current at standstill per pantograph	[NNN]	Indication of the maximum allowable train current at standstill for DC systems expressed in amperes.		X	16 January 2020
1.2.3	Rules and restrictions					
1.2.3.1	Existence of rules and restrictions of a strictly local nature	Single selection from the predefined list: Y/N	Existence of rules and restrictions of a strictly local nature			1 January 2021

Number	Title	Data presentation	Definition	Core parameter	Needed for RC	Deadline to provide the parameter
1.2.3.2	Documents regarding the rules or restrictions of a strictly local nature available by the IM	CharacterString	Electronic document available from the IM stored by the Agency providing additional information			1 January 2021

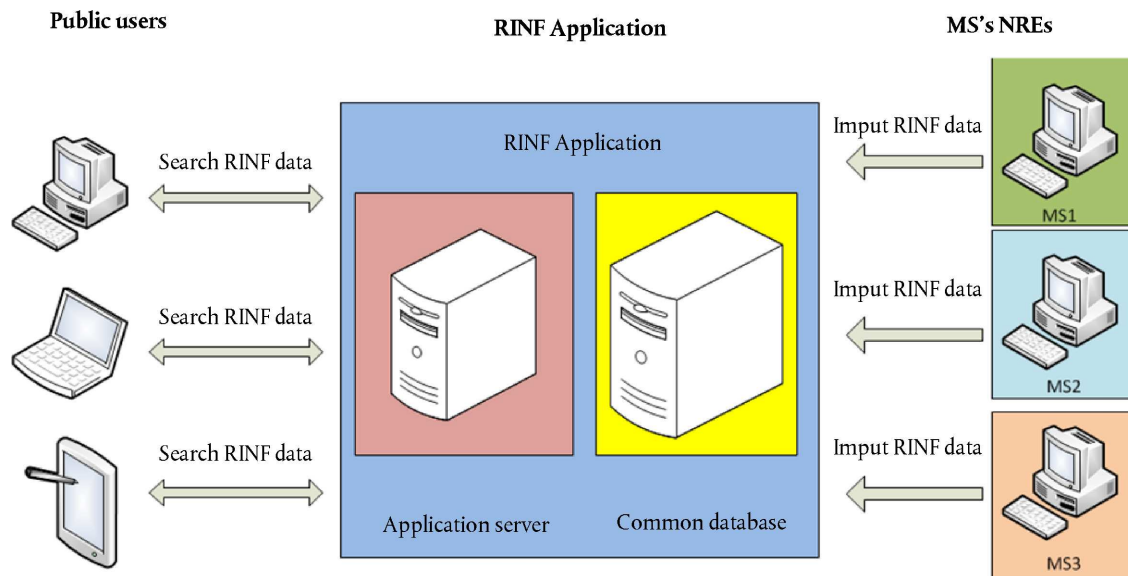
- (<sup>1</sup>) Commission Implementing Regulation (EU) 2019/250 of 12 February 2019 on the templates for 'EC' declarations and certificates for railway interoperability constituents and subsystems, on the model of declaration of conformity to an authorised railway vehicle type and on the 'EC' verification procedures for subsystems in accordance with Directive (EU) 2016/797 of the European Parliament and of the Council and repealing Commission Regulation (EU) No 201/2011 (OJ L 42, 13.2.2019, p. 9).
- (<sup>2</sup>) Commission Recommendation 2014/881/EU of 18 November 2014 on the procedure for demonstrating the level of compliance of existing railway lines with the basic parameters of the technical specifications for interoperability (OJ L 356, 12.12.2014, p. 520).
- (<sup>3</sup>) Commission Regulation (EU) No 1299/2014 of 18 November 2014 on the technical specifications for interoperability relating to the 'infrastructure' subsystem of the rail system in the European Union (OJ L 356, 12.12.2014, p. 1).
- (<sup>4</sup>) Commission Regulation (EU) No 1304/2014 of 26 November 2014 on the technical specification for interoperability relating to the subsystem 'rolling stock — noise' amending Decision 2008/232/EC and repealing Decision 2011/229/EU (OJ L 356, 12.12.2014, p. 421).
- (<sup>5</sup>) 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).

## 4. HIGH LEVEL SYSTEM OVERVIEW

## 4.1. Register of infrastructure system

The architecture of the registers of infrastructure system shall be as follows.

Figure 1

**RINF system**

## 4.2. Administration of the RINF application

The RINF application shall be a web-based application set up, managed, maintained and administered by the Agency.

The Agency shall make available to the national registration entities (NREs) the following files and documents to be used for the setting up of the registers of infrastructure and connecting them with the RINF application:

- user manual;
- specification of the structure of the files for the transmission of data;
- description of codes for preparing the files — Guide describing the validation process of the transmitted files.

## 4.3. Minimum required functionality of the RINF application

The RINF application shall provide at least the following functionalities:

- user management: the RINF application administrator must be able to manage users' access rights;
- information auditing: the RINF application administrator must be able to view the logs of all user activity performed on the RINF application as a list of the activities that have been performed by RINF application users within a particular timeframe;
- connectivity and authentication: the registered RINF application users must be able to connect to the RINF application via internet and use its functionalities according to their rights;
- prepare files for infrastructure managers users;

- (e) merge files for national registration entity users;
- (f) search for the register of infrastructure data including OPs and/or SoLs, including data validity dates;
- (g) select an OP or a SoL and view its details: the RINF application users must be able to define a geographical area using the map interface and the RINF application provides the available data requested by the users for this area;
- (h) view information for a specified subset of lines and OPs in a defined area via a map interface;
- (i) visual representation of items of the register of infrastructure on a digital map: the users, through the RINF application, must be able to navigate, select an item depicted on the map and retrieve any relevant information;
- (j) visual representation of data of the register of infrastructure allowing publication of thematic maps;
- (k) list SoLs and OPs which are part of a route defined by the user and export the corresponding characteristics;
- (l) deliver a certificate each time the export of characteristics resulting from a search is intended to be used by a railway undertaking in accordance with Article 23(1) of Directive (EU) 2016/797;
- (m) application programming interface (API);
- (n) validation, upload and reception of the data sets provided by a national register entity.

#### 4.4. **Operating mode**

The register of infrastructure system shall provide two main interfaces via the RINF application:

- (a) one which is to be used by Member States in order to submit their set of data;
- (b) the other which is to be used by RINF application users in order to connect to the system and retrieve information.

Pending the evolution of the RINF application to allow infrastructure managers to update information directly in it, the RINF application central database shall be fed with copies of the sets of data maintained by each Member State. In particular, NREs shall create files that encapsulate the full set of data following the specifications of Table 1 and submit it to the RINF application in accordance with Article 5.

NREs shall upload the files to the RINF application through a dedicated interface provided for this operation. A specific module shall facilitate the validation and uploading of data provided by NREs.

The RINF application central database shall make data sent by NREs publicly available without any modification.

The basic functionality of the RINF application shall allow users to search and retrieve data of register of infrastructure.

The RINF application shall retain the complete historical record of data made available by NREs. Those records shall be stored for two years from the date of withdrawal of the data.

The Agency, as administrator of the RINF application, shall provide access to users upon request.

Answers to the queries initiated by the RINF application users shall be provided within 24 hours from the moment the query was initiated.

#### 4.5. **Availability**

The RINF application shall be available seven days a week. The unavailability of the system shall be minimal during maintenance.

In the case of failure outside the normal working hours of the Agency, the actions to restore the service shall start the next Agency working day.

5. APPLICATION GUIDE FOR THE COMMON SPECIFICATIONS

The application guide for the common specifications referred to in Article 7 shall be made publicly available by the Agency on its website and updated as appropriate.

It shall provide extended definitions of all the objects and parameters of the register of infrastructure and guidance on the most common situations and on solutions for modelling the railway network.

It shall contain in particular:

- (a) description of the functionalities provided by the RINF application;
- (b) items and their corresponding description as specified as section 3.3 and in Table 1. For each field, at least its format, limit of value, conditions under which parameter is applicable and mandatory, railway technical rules for parameters values, reference to TSIs and other technical documents related to items of the register of infrastructure;
- (c) detailed definitions and specifications for parameters;
- (d) presentation of provisions for modelling the network and collecting data with relevant explanations and examples;
- (e) procedures for validation and submission of data from registers of infrastructure of the Member States to the RINF application.

The application guide shall provide explanations on the specifications referred to in this Annex which are necessary for the proper development of the register of infrastructure system.

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**COMMISSION IMPLEMENTING REGULATION (EU) 2019/778**  
**of 16 May 2019**  
**amending Regulation (EU) No 1305/2014 as regards Change Control Management**  
**(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 Union <sup>(1)</sup>, and in particular Article 5(11) thereof,

Whereas:

- (1) Article 19 of Regulation (EU) 2016/796 of the European Parliament and of the Council <sup>(2)</sup> requires the European Union Agency for Railways ('the Agency') to address recommendations to the Commission on the technical specifications for interoperability ('TSIs') and their revision, in accordance with Article 5 of Directive (EU) 2016/797, and to ensure that TSIs are adapted to technical progress, market trends and social requirements.
- (2) Article 13 of Commission Delegated Decision (EU) 2017/1474 <sup>(3)</sup> requires the Section 7.2 of the Annex to Commission Regulation (EU) No 1305/2014 <sup>(4)</sup> (TAF TSI) to be amended for specifying the modified change control procedure for the TAF TSI.
- (3) According to Article 5 of Regulation (EU) 2016/796, a working party has been established for making a proposal for a recommendation as regards the changes of the section 7.2 of the TAF TSI.
- (4) On 20 April 2018, the Agency addressed a recommendation to the Commission on the revision of section 7.2 of the Annex to Regulation (EU) No 1305/2014.
- (5) Section 7.2 of of the Annex to Regulation (EU) No 1305/2014 related to TAF TSI should be amended accordingly.
- (6) The list of the relevant technical documents referenced in TAF TSI should be updated.
- (7) 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*

Section 7.2 of the Annex to Regulation (EU) No 1305/2014 is replaced by Annex I to this Regulation.

*Article 2*

Appendix I of the Annex to Regulation (EU) No 1305/2014 is replaced by the text in Annex II to this Regulation.

<sup>(1)</sup> OJ L 138, 26.5.2016, p. 44.

<sup>(2)</sup> 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 881/2004 (OJ L 138, 26.5.2016, p. 1).

<sup>(3)</sup> Commission Delegated Decision (EU) 2017/1474 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).

<sup>(4)</sup> Commission Regulation (EU) No 1305/2014 of 11 December 2014 on the technical specification for interoperability relating to the telematics applications for freight subsystem of the rail system in the European Union and repealing the Regulation (EC) No 62/2006 (OJ L 356, 12.12.2014, p. 438).

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*Article 3*

This Regulation shall enter into force on the twentieth 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, 16 May 2019.

*For the Commission*  
*The President*  
Jean-Claude JUNCKER

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## ANNEX I

Section 7.2 of the Annex to Regulation (EU) No 1305/2014 is replaced by the following:

**7.2. Change Management****7.2.1. Change Management Process**

Change management procedures shall be designed to ensure that the costs and benefits of change are properly analysed and that changes are implemented in a controlled way. These procedures shall be defined, put in place, supported and managed by the Agency and shall include:

- the identification of the technical constraints underpinning the change,
- a statement of who takes responsibility for the change implementation procedures,
- the procedure for validating the changes to be implemented,
- the policy for change management, release, migration and roll-out,
- the definition of the responsibilities for the management of the detailed specifications and for both its quality assurance and configuration management.

The Change Control Board (CCB) shall be composed of the Agency, rail sector representative bodies and Member States. Such an affiliation of the parties shall ensure a perspective on the changes that are to be made and an overall assessment of their implications. The CCB ultimately shall be brought under the aegis of the Agency.

**7.2.2. Specific Change Management Process for documents listed in Appendix I to this Regulation**

The change control management for the documents listed in Appendix I to this Regulation shall be established by the Agency in accordance with the following criteria:

1. The change requests affecting the documents are submitted either via the Member States or via the representative bodies from the railway sector acting on a European level as defined in Article 38(4) of Regulation (EU) 2016/796 of the European Parliament and of the Council (\*), or via the TAF TSI Steering Committee.
2. The Agency shall gather and store the change requests.
3. The Agency shall present the change requests to the dedicated ERA working party, which will evaluate them and prepare a proposal accompanied by an economic evaluation, where appropriate.
4. Afterwards the Agency shall present each change request and the associated proposal to the change control board that will or will not validate or postpone the change request.
5. If the change request is not validated, the Agency shall send back to the requester either the reason for the rejection or a request for additional information about the draft change request.
6. If the change request is validated, the technical document shall be amended.
7. If no consensus about the validation of a change request can be reached, the Agency shall submit to the Commission a recommendation to update the documents listed in Appendix I together with the draft new version of the document, the change requests and their economic evaluation and shall make these documents available on their web site.
8. The new version of the technical document with the validated change requests shall be made available at the site of the Agency. The Agency will keep the Member States informed via the Committee established in accordance with Article 29(1) of Directive 2008/57/EC.
9. If a change request would require a change of the legal text of the TAF TSI, the Agency shall send a request to the European commission to request a revision of the TAF TSI and/or request the technical opinion from the Agency.

Where change control management affects elements which are in common use within the TAP TSI, the changes shall be made so as to remain compliant to the implemented TAP TSI in order to achieve optimum synergies.

(\*) 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 881/2004 (OJ L 138, 26.5.2016, p. 1).'



## ANNEX II

Appendix I of the Annex to Regulation (EU) No 1305/2014 is replaced by the following:

*Appendix I***List of technical documents**

No	Reference	Title
1	ERA-TD-100	TAF TSI — ANNEX A.5:FIGURES AND SEQUENCE DIAGRAMS OF THE TAF TSI MESSAGES
2	ERA-TD-101	Annex D.2: Appendix A (Wagon/ILU Trip Planning)
3	ERA-TD-102	Annex D.2: Appendix B — Wagon and Intermodal Unit Operating Database (WIMO)
4	ERA-TD-103	Annex D.2: Appendix C — Reference Files
5	ERA-TD-104	Annex D.2: Appendix E — Common Interface
6	ERA-TD-105	Annex D.2: Appendix F — TAF TSI Data and Message Model'

**COMMISSION IMPLEMENTING REGULATION (EU) 2019/779  
of 16 May 2019**

**laying down detailed provisions on a system of certification of entities in charge of maintenance  
of vehicles pursuant to Directive (EU) 2016/798 of the European Parliament and of the Council  
and repealing Commission Regulation (EU) No 445/2011**

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

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

Having regard to Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety <sup>(1)</sup>, and in particular Article 14(6) and (8) thereof,

Whereas:

- (1) Directive (EU) 2016/798 aims to improve access to the market for rail transport services by defining common principles for the management, regulation and supervision of railway safety. Directive (EU) 2016/798 also provides for a framework to be put in place to ensure equal conditions for all entities in charge of maintenance for vehicles through application of the same certification requirements and conditions across the Union.
- (2) The purpose of the certification system is to provide a framework for harmonising requirements and methods to assess the ability of entities in charge of maintenance across the Union.
- (3) Following the positive evaluation of the current system of certification of entities in charge of maintenance for freight wagons addressed to the Commission on 11 March 2015 by the European Union Agency for Railways (the Agency), on 27 September 2018, the Agency issued Recommendation 007REC1004 on the revision of Commission Regulation (EU) No 445/2011 <sup>(2)</sup>.
- (4) Annex III to Directive (EU) 2016/798 sets out the requirements and assessment criteria for organisations applying for a certificate for entity in charge of maintenance ('ECM certificate') or for a certificate in respect of maintenance functions outsourced by an entity in charge of maintenance. In order to be fully applicable those requirements need to be further detailed and specified for the different maintenance functions as referred to in points (a) to (d) of Article 14(3) of that Directive.
- (5) Taking into account the wide variety of design and maintenance methods, that system of maintenance should be more oriented on the management requirements, such as the organisation of the entity in charge of maintenance, rather than a specific technical requirement.
- (6) Safety-critical components require particular attention and priority in maintenance procedures. However, the criticality aspects of any component are related to the particular design of the vehicle and to the particular functions of the component. It is therefore not possible to establish an exhaustive list of safety-critical components. The essential elements of safety-critical components should be set out.
- (7) When designing a new type of vehicle, the manufacturer should determine the criticality of the functions and components of their products by a risk-based analysis and record them in the technical file referred to in Article 15(4) of Directive (EU) 2016/797 of the European Parliament and of the Council <sup>(3)</sup>. The determination of the criticality should take into account how the component is intended to be used and the environment in which it will be used. The entity in charge of maintenance should have access to the relevant parts of the technical file to ensure it is fully aware of the criticality of the components for each type of vehicles under its responsibility. The entity in charge of maintenance should identify criticalities by observing and analysing the failures and tracing all its interventions, and be obliged to provide information at least on the safety-critical components identified as such by the manufacturer.

<sup>(1)</sup> OJ L 138, 26.5.2016, p. 102.

<sup>(2)</sup> Commission Regulation (EU) No 445/2011 of 10 May 2011 on a system of certification of entities in charge of maintenance for freight wagons and amending Regulation (EC) No 653/2007 (OJ L 122, 11.5.2011, p. 22)

<sup>(3)</sup> 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 Union (OJ L 138, 26.5.2016, p. 44).

- (8) Where the entity in charge of maintenance considers that new safety-critical components should be included in the technical file or components should be reclassified as non safety-critical, it should promptly inform the manufacturer, the holder of the vehicle type authorisation and the holder of the vehicle authorisation to allow taking the necessary measures, including a revision of the technical file, if needed.
- (9) An entity or organisation taking on one or more maintenance functions as referred to in points (b) to (d) of Article 14(3) of Directive (EU) 2016/798 or part of those maintenance functions may apply the system of certification on a voluntary basis, based on the principles specified in Article 6. The aim of that certification is to ensure that maintenance is carried out within a controlled process that meets common quality standards in all its steps. Article 14(5) of Directive (EU) 2016/798 on the validity throughout the Union should also apply to those voluntary certificates.
- (10) As part of their activities, infrastructure managers may need to use trains, infrastructure inspection vehicles, on-track machines or other special vehicles for different purposes, such as transporting materials or staff for construction or infrastructure maintenance, performing maintenance on its infrastructure assets or managing emergency situations. In such situations, the infrastructure manager should be deemed to operate in the capacity of a railway undertaking under its safety management system. Assessing the infrastructure manager's capacity to operate vehicles for this purpose should be part of its assessment for a safety authorisation under Article 12 of Directive (EU) 2016/798.
- (11) The assessment by a certification body of an application for an ECM certificate is an assessment of the applicant's ability to manage maintenance activities and to deliver the operational functions of maintenance either by itself or through contracts with other bodies, such as maintenance workshops, charged with delivering those functions or parts of those functions.
- (12) In accordance with Article 14(4) of Directive (EU) 2016/798, the certification bodies are accredited bodies, recognised bodies or the national safety authorities. A system of accreditation should provide a tool for managing risks by assuring that accredited bodies are competent to carry out the work they undertake. Furthermore, accreditation is a means to secure national and international recognition of ECM certificates issued by accredited bodies.
- (13) In order to have a system allowing certification bodies to perform checks on certified entities in charge of maintenance across the Union and to harmonise approaches to certification, it is important that all bodies able to award certificates to any entity in charge of maintenance ('certification bodies') cooperate with one another. Specific requirements for accreditation and recognition are to be developed and approved in accordance with Chapter II of Regulation (EC) No 765/2008 of the European Parliament and of the Council <sup>(4)</sup>.
- (14) Performance, organisation and decision-making procedures in the field of railway safety and interoperability vary substantially among the entities in charge of maintenance, with a detrimental effect on the smooth operation of the single European railway area. In particular, small and medium-sized enterprises wishing to enter the railway market in another Member State might be negatively affected by that. Therefore, strengthened coordination with a view to greater harmonisation at Union level is essential. In order to ensure that the entities in charge of maintenance and the certification bodies implement and apply consistently the different provisions of this Regulation, the European Union Agency for Railways ('the Agency') should, within its powers to monitor the overall safety performance of the Union rail system referred to in Article 35 of Regulation (EU) 2016/796 of the European Parliament and of the Council <sup>(5)</sup>, monitor the activities of the certification bodies through audit and inspections. To be able to perform this function, the Agency should collect information on the nature of the certification bodies active in that field and the number of certificates issued to entities in charge of maintenance. It is also important for the Agency to facilitate coordination of the certification bodies.
- (15) Pending the full application of the certification system of the entity in charge of maintenance provided for in this Regulation, the existing practices to certify entities in charge of maintenance and maintenance workshops for vehicles other than freight wagons should remain valid during a period of transition in order to ensure the uninterrupted provision of rail operation services, in particular at international level.
- (16) This Regulation provides for a system of certification for all types of vehicles, including freight wagons. Therefore, Commission Regulation (EU) No 445/2011 <sup>(6)</sup> should be repealed.

<sup>(4)</sup> Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93 (OJ L 218, 13.8.2008, p. 30).

<sup>(5)</sup> 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 881/2004 (OJ L 138, 26.5.2016, p. 1–43)

<sup>(6)</sup> Commission Regulation (EU) No 445/2011 of 10 May 2011 on a system of certification of entities in charge of maintenance for freight wagons and amending Regulation (EC) No 653/2007 (OJ L 122, 11.5.2011, p. 22).

- (17) The measures provided for in this Regulation are in accordance with the opinion of the Committee referred to in Article 28(1) of Directive (EU) 2016/798,

HAS ADOPTED THIS REGULATION:

#### *Article 1*

### **Subject matter and scope**

1. This Regulation establishes a system of certification of entities in charge of maintenance ('ECM certificate') including the maintenance functions described in Article 14(3) of Directive (EU) 2016/798.
2. It applies to all vehicles, and introduces the possibility for certification of outsourced maintenance functions.
3. This Regulation sets out the requirements to be met by the entities in charge of maintenance concerning the management of safety-critical components.

#### *Article 2*

### **Definitions**

For the purposes of this Regulation, the following definitions shall apply:

- (a) 'accreditation' means accreditation as defined in Article 2(10) of Regulation (EC) No 765/2008;
- (b) 'certification body' means a body, responsible for the certification of entities in charge of maintenance or for certification of the entity or organisation that fulfil maintenance functions referred to in points (b), (c) or (d) of Article 14(3) of Directive (EU) 2016/798, or parts of those functions;
- (c) 'release to service' means the justified and recorded assurance, accompanied by documentation where appropriate, given by the entity delivering the maintenance to the fleet-maintenance manager that maintenance has been delivered according to the maintenance orders;
- (d) 'return to operation' means a notice given to the user, such as a railway undertaking or a keeper, by the entity in charge of maintenance, based on a release to service, assuring that all appropriate maintenance works have been completed and the vehicle, previously removed from operation, is in a condition to be used safely, possibly subject to restrictions of use;

The definition of 'safety-critical component' provided for in section 4.2.12.1 of Annex to Commission Regulation (EU) No 1302/2014 <sup>(7)</sup> shall apply.

#### *Article 3*

### **System of Certification**

1. Without prejudice to Article 15(1) of Directive (EU) 2016/798, any entity in charge of maintenance shall satisfy the requirements of Annex II, in respect of all vehicles subject to Directive (EU) 2016/798.
2. An ECM certification establishing compliance with the requirements of Annex II shall be mandatory for any entity in charge of maintenance:
  - (a) responsible for the maintenance of freight wagons, or
  - (b) which is not a railway undertaking or an infrastructure manager maintaining vehicles exclusively for its own operations.
3. Any entity in charge of maintenance of vehicles other than those mentioned in paragraph 2, may apply for ECM certification.

<sup>(7)</sup> Commission Regulation (EU) No 1302/2014 of 18 November 2014 concerning a technical specification for interoperability relating to 'rolling stock – locomotives and passengers rolling stock' subsystem of the rail system in the European Union (OJ L 356, 12.12.2014, p. 228).

4. Compliance with Annex II shall be demonstrated either through an ECM certification or, without prejudice to paragraph 2, in case of railway undertakings through the process of safety certification or in case of infrastructure managers through the process of safety authorisation.
5. The ECM certificate granted to a railway undertaking or an infrastructure manager shall be deemed evidence of compliance with points 5.2.4 and 5.2.5 both of Annex I and Annex II to Commission Delegated Regulation (EU) 2018/762 <sup>(8)</sup> as regards maintenance of vehicles.

#### Article 4

##### **Safety-critical components**

1. For managing safety-critical components, the entity in charge of maintenance shall take into account the initial identification of safety-critical components by the manufacturer of the vehicle together with any specific maintenance instructions recorded in the technical files of subsystems referred to in Article 15(4) of Directive (EU) 2016/797.
2. The entity in charge of maintenance shall, either directly or via the keeper provide information to the railway undertakings and infrastructure managers operating the vehicles, keepers, manufacturers, holders of vehicles authorisations and holders of the type authorisation of vehicles, subsystems or components, as most appropriate and shall in particular, inform them of exceptional maintenance findings beyond wear and tear.
3. Where during the maintenance of a vehicle an entity in charge of maintenance becomes aware of evidence suggesting a component not previously identified as safety critical should be considered as such, it shall inform the manufacturer, the holder of the vehicle type authorisation and the holder of the vehicle authorisation without delay.
4. To confirm if the component is safety critical the manufacturer, when it can be identified, shall perform a risk assessment. It shall take into account the component's intended use and the environment in which it is intended to be used. As appropriate, the entity in charge of maintenance shall adjust its maintenance procedures to ensure monitoring and the safe maintenance of the component.
5. Safety critical components including those identified under paragraph 4 above, shall be recorded in and managed through the relevant vehicle documentation as follows:
  - (a) manufacturers shall manage information on safety critical components and appropriate maintenance instructions related to them through reference in the technical file of subsystems referred to in Article 15(4) of Directive (EU) 2016/797; and
  - (b) entities in charge of maintenance shall manage safety critical components and appropriate maintenance instructions as well as relevant maintenance activities in the maintenance file or documentation referred to in Article 14 of Directive (EU) 2016/798.
6. The entity in charge of maintenance shall inform the rail sector and the rail supply industry about new or unexpected safety relevant findings including exceptional maintenance findings beyond wear and tear, in relation to vehicles, subsystems or other components, when the related risks are relevant for more actors and are likely to be poorly controlled. The entity in charge of maintenance shall use the Safety Alert IT or another informatics tool provided by the Agency for this purpose.
7. At the request of the entity in charge of maintenance or of the keeper of the vehicle, the manufacturers shall provide technical and engineering support for safety-critical components and their safe integration.

#### Article 5

##### **Obligations of parties involved in the maintenance process**

1. The entity in charge of the maintenance of the vehicle shall deliver information on the maintenance of a vehicle, and, where applicable on aspects relevant for the operation to the railway undertakings or infrastructure managers at request, either directly or via the keeper.

<sup>(8)</sup> Commission Delegated Regulation (EU) 2018/762 of 8 March 2018 establishing common safety methods on safety management system requirements pursuant to Directive (EU) 2016/798 of the European Parliament and of the Council and repealing Commission Regulations (EU) No 1158/2010 and (EU) No 1169/2010 (OJ L 129, 25.5.2018, p. 26).

2. The railway undertaking or the infrastructure manager shall deliver information on the operation of a vehicle to the entity in charge of maintenance at request, either directly or via the keeper of the vehicle.
3. All parties involved in the maintenance process such as railway undertakings, infrastructure managers, keepers, entities in charge of maintenance, as well as manufacturers of vehicles, subsystems or components, shall exchange relevant information about maintenance in accordance with the criteria listed in Sections I.7 and I.8 of Annex II.
4. Where any involved party, in particular a railway undertaking or an infrastructure manager, has evidence that an entity in charge of maintenance does not comply with Article 14 of Directive (EU) 2016/798 or with the requirements of this Regulation, it shall without delay inform the certification body and the relevant national safety authority thereof. The certification body or, where the entity in charge of maintenance is not certified, the relevant national safety authority shall take appropriate action to check whether the claim of non-compliance is justified.
5. Where there is a change of entity in charge of maintenance, the keeper, in accordance with Article 47(6) of Directive (EU) 2016/797, shall inform without delay the registration entity referred to in Article 4(1) of Commission Decision 2007/756/EC <sup>(9)</sup> and request the update of the vehicle register. In that situation:
  - (i) the former entity in charge of maintenance shall without delay deliver the maintenance documentation to the keeper;
  - (ii) the former entity in charge of maintenance shall be relieved of its obligations when it is removed from the vehicle register;
  - (iii) in the absence of a new entity in charge of maintenance the registration of the vehicle shall be suspended.

#### Article 6

### Certification bodies

1. Member States shall provide the Agency with the following information concerning the certification bodies:
  - name
  - address
  - contact details
  - the nature of their empowerment in accordance with Article 14 of Directive (EU) 2016/798 (accreditation, recognition or if they have taken on the task as the national safety authority)
2. Member States shall inform the Agency about any change in the situation within one month of the occurrence of that change.
3. Member States shall ensure that the certification bodies comply with the general criteria and principles set out in Annex I and with any specific sectoral accreditation schemes laid down by the relevant Union legislation.
4. Member States shall ensure that decisions taken by the certification bodies are subject to judicial review.
5. In order to harmonise approaches to the assessment of applications, the certification bodies shall cooperate with one another both within the Member States and across the Union.
6. The Agency shall organise and facilitate cooperation between the certification bodies.
7. The certification bodies shall deliver an activity report in an electronic form every 3 years to the Agency. The content of such a report shall be defined by the Agency (in collaboration with the certification bodies) and made available on 16 December 2020 and in accordance with any specific sectoral accreditation schemes laid down by the relevant Union legislation. The Agency shall publish the reports on its website.
8. A national safety authority, a national investigation body or the Agency may request information from any certification body on the situation concerning an individual ECM certification. The certification body shall reply within 2 weeks at the latest.

<sup>(9)</sup> Commission Decision 2007/756/EC of 9 November 2007 adopting a common specification of the national vehicle register provided for under Articles 14(4) and (5) of Directives 96/48/EC and 2001/16/EC (OJ L 305, 23.11.2007, p. 30).

*Article 7***Certification of entities in charge of maintenance**

1. The entity in charge of maintenance shall apply for ECM certification to a certification body. It shall use the relevant form in Annex III and provide documentary evidence for the requirements and procedures set out in Annex II. The application shall include the description of the strategy to ensure continued compliance with the requirements set out in Annex II, after the award of the ECM certification, including the compliance with Commission Regulation (EU) No 1078/2012 <sup>(10)</sup>.
2. The application for ECM certification may be limited to a specified category of vehicles.
3. The applicant shall submit supplementary information and documentation at the request of the certification body. The timeframe for providing supplementary information shall be reasonable, proportionate to the difficulty of providing the information requested and agreed with the applicant upon request.
4. The certification body shall verify the fulfilment of the requirements set out in Annex II. To that end, it may undertake site visits of the entity in charge of maintenance.
5. The certification body shall take a decision to award or refuse ECM certification at the latest 4 months after all the information and documentation has been received.
6. The certification body shall give the reasons for its decisions. It shall notify its decision to the entity in charge of maintenance, with an indication of the appeal process, the time limit for an appeal and the contact details of the appeal body.
7. The decision to award the ECM certification shall be notified using the relevant form set out in Annex IV.
8. An ECM certification shall be valid for a maximum period of 5 years. The certified entity in charge of maintenance shall inform the certification body of any changes that might have an impact on the validity of its certification without delay.

*Article 8***Compliance of entities in charge of maintenance**

1. The certification body shall conduct surveillance activities in respect of the entity in charge of maintenance to verify continued compliance with the requirements set out in Annex II. It shall conduct site visits at least once every 12 months. The choice regarding the nature of surveillance activities and sites to be visited shall aim at ensuring overall continuing compliance and shall be based on a geographical and functional balance. It shall take account of previous surveillance activities of the entity in charge of maintenance under surveillance.
2. Where the certification body finds that an entity in charge of maintenance no longer complies with the requirements on the basis of which it issued the ECM certification, it can take one of the following actions:
  - agree an improvement plan with the entity in charge of maintenance,
  - decide to limit the scope of the ECM certification,
  - suspend or revoke the certification, depending on the extent of non-compliance.
3. Where the entity in charge of maintenance does not follow the improvement plan or continues not to comply with the requirements set out in Annex II, the certification body shall decide to limit the scope of or revoke the ECM certification, depending on the extent of non-compliance.
4. In case of revocation of an ECM certification, the entity in charge of the national or European vehicle register shall ensure suspension of the registration of vehicles affected by the revocation, until a new entity in charge of maintenance is registered for the vehicles concerned.
5. Each entity in charge of maintenance shall submit an annual report of its activities to its certification body and make it available to the national safety authority and to the Agency upon request. The requirements for this report are set out in Annex V.

<sup>(10)</sup> Commission Regulation (EU) No 1078/2012 of 16 November 2012 on a common safety method for monitoring to be applied by railway undertakings, infrastructure managers after receiving a safety certificate or safety authorisation and by entities in charge of maintenance (OJ L 320, 17.11.2012, p. 8).

*Article 9***Outsourcing maintenance functions**

1. One or more of the functions referred to in points (b), (c) and (d) of Article 14(3) of Directive (EU) 2016/798, or parts thereof, may be outsourced and the certification body shall be informed thereof.
2. The entity in charge of maintenance shall demonstrate to the certification body how it complies with all the requirements and assessment criteria set out in Annex II with regard to the functions it decided to outsource.
3. The entity in charge of maintenance shall remain responsible for the outcome of the outsourced maintenance activities and shall establish a system to monitor their performance.

*Article 10***Certification for outsourced maintenance functions**

1. A certification may be requested by any entity or organisation taking on one or more maintenance functions as referred to in points (b), (c) and (d) of Article 14(3). Such a certification shall confirm that the maintenance carried out by the entity or organisation concerned of one or more of those functions complies with the relevant requirements set out in Annex II.
2. Certification bodies shall apply the procedures set out in Articles 6, 7, 8 and 13(2) adapted to the particular case of the applicant.

In assessing applications for certification in respect of outsourced maintenance functions or parts thereof, certification bodies shall apply:

- (a) the requirements and assessment criteria set out in Section I of Annex II, adapted to the organisation's type and extent of service;
- (b) the requirements and assessment criteria describing the specific maintenance function or functions.

*Article 11***Role of the national safety authorities**

If a national safety authority has knowledge that an entity in charge of maintenance does not comply with the requirements of Annex III of Directive (EU) 2016/798 or with the certification requirements of this Regulation, it shall inform the national bodies or authorities responsible for the accreditation or recognition, the Agency, the certification body and other interested parties as appropriate.

*Article 12***Cooperation with the certification bodies**

The Agency shall support the harmonised system of certification through the provision of:

- (a) assistance to national accreditation bodies and to the relevant national authorities recognising the certification bodies;
- (b) cooperation on appropriate accreditation and certification schemes. Those schemes shall set out evaluation criteria and procedures to assess compliance of certification bodies with the requirements set out in Annex I (via the European accreditation infrastructure established pursuant to Article 14 of Regulation (EC) No 765/2008).

*Article 13***Provision of information**

1. The Agency shall collect, record and publish basic information on certification bodies and certified entities in charge of maintenance. The Agency shall create an IT tool for delivering this task.



2. Certification bodies shall notify the Agency of all issued, amended, renewed, suspended or revoked ECM certifications or of all certifications for functions as referred to in points (b), (c) and (d) of Article 14(3) of Directive (EU) 2016/798, within one week from its decision, using the forms set out in Annex IV.

#### Article 14

### Reporting

The Agency shall address to the Commission a first report on the implementation of this Regulation five years following its entry into force. The Agency shall address subsequent reports on the implementation of this Regulation every three years following the first report.

#### Article 15

### Transitional provisions

1. Certification bodies accredited or recognised pursuant to Regulation (EU) No 445/2011 shall be deemed accredited or recognised in accordance with this Regulation under the conditions for which those certification bodies have been accredited or recognised.
2. The attestation for an entity in charge of maintenance for vehicles other than freight wagons, issued by the certification body on the basis of national laws, applicable in the field governed by this Regulation, before 16 June 2020 shall be recognised as being equivalent to ECM certification for its original period of validity or at the latest, until 16 June 2023.
3. Attestations of conformity with the principles and criteria equivalent to the requirements of Annex III of Regulation (EU) No 445/2011 issued by a certification body for vehicles other than freight wagons, by 16 June 2019 at the latest, shall be deemed equivalent to ECM certifications issued under this Regulation for their original period of validity or at the latest, until 16 June 2023.
4. Attestations of conformity for outsourced maintenance functions for vehicles other than freight wagons, issued by the certification body by 16 June 2022 at the latest, on the basis of national laws applicable in the field governed by this Regulation before its entry into force shall be deemed equivalent to ECM certifications for outsourced maintenance functions issued under this Regulation for their original period of validity or at the latest, until 16 June 2025.
5. All entities in charge of maintenance for the vehicles referred to in point (b) of Article 3 (2) other than freight wagons and vehicles listed in Article 15(1) of Directive (EU) 2016/798, which are not subject to paragraphs 2 to 4, shall comply with this Regulation by 16 June 2022 at the latest.

#### Article 16

### Repeal

Regulation (EU) No 445/2011 is repealed with effect from 16 June 2020.

Certificates issued under Regulation (EU) No 445/2011 by a certification body shall be deemed equivalent to certificates issued under this Regulation for their original period of validity.

#### Article 17

### Entry into force

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

It shall apply from 16 June 2020.

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

Done at Brussels, 16 May 2019.

*For the Commission*

*The President*

Jean-Claude JUNCKER

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## ANNEX I

**Criteria for accreditation or recognition of certification bodies involved in the assessment and award of ECM certificates**

## 1. ORGANISATION

The certification body shall document its organisational structure, showing the duties, responsibilities and authorities of management and other certification staff and any committees. Where the certification body is a defined part of a legal entity, the structure shall include the line of authority and the relationship to other parts within the same legal entity.

## 2. INDEPENDENCE

The certification body shall be organisationally and functionally independent in its decision-making from railway undertakings, infrastructure managers, keepers, manufacturers and entities in charge of maintenance and shall not provide similar services.

The independence of the staff responsible for the certification checks shall be guaranteed. No official shall be remunerated on the basis of either the number of checks performed or the results of those checks.

## 3. COMPETENCE

The certification body and the staff deployed shall have the required professional competence, in particular regarding the organisation of the maintenance of vehicles and the appropriate maintenance system. The specific requirements addressing the personnel involved in the management and performance of assessment and in the certification shall be described in the accreditation scheme.

## 4. IMPARTIALITY

The certification body's decisions shall be based on objective evidence of conformity or non-conformity obtained by the certification body, and shall not be influenced by other interests or by other parties.

## 5. RESPONSIBILITY

The certification body is not responsible for ensuring ongoing conformity with the requirements for certification.

The certification body has the responsibility to assess sufficient objective evidence upon which to base a certification decision.

## 6. OPENNESS

A certification body shall provide public access to, or disclosure of, appropriate and timely information about its audit process and certification process. It shall also provide information about the certification status (including the granting, extension, maintenance, renewal, suspension, reduction in scope, or withdrawal of certification) of any organisation, in order to develop confidence in the integrity and credibility of certification. Openness is a principle of access to, or disclosure of, appropriate information.

## 7. CONFIDENTIALITY

To gain the privileged access to information needed to assess conformity with the requirements for certification adequately, a certification body shall keep confidential any commercial information about a client.

## 8. RESPONSIVENESS TO COMPLAINTS

The certification body shall establish a procedure to handle complaints about decisions and other certification-related activities.

## 9. LIABILITY AND FINANCING

The certification body shall be able to demonstrate that it has evaluated the risks arising from its certification activities and that it has adequate arrangements (including insurance or reserves) to cover liabilities arising from its operations in each field of its activities and the geographic areas in which it operates.

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## ANNEX II

**Requirements and assessment criteria for organisations applying for an ECM certificate or for a certificate in respect of maintenance functions outsourced by an entity in charge of maintenance****I. Requirements and assessment criteria for the management function**

1. **Leadership** — *commitment to the development and implementation of the maintenance system of the organisation and to the continuous improvement of its effectiveness*

The organisation shall have procedures for:

- (a) establishing a maintenance policy appropriate to the organisation's type and extent of service and approved by the organisation's chief executive or his or her representative;
- (b) ensuring that safety targets are established, in line with the legal framework and consistent with an organisation's type, extent and relevant risks;
- (c) assessing its overall safety performance in relation to its corporate safety targets;
- (d) developing plans and procedures for reaching its safety targets;
- (e) ensuring that the resources needed to perform all processes are available to comply with the requirements of this Annex;
- (f) identifying and managing the impact of other management activities on the maintenance system;
- (g) ensuring that senior management is aware of the results of performance monitoring and audits and takes overall responsibility for the implementation of changes to the maintenance system;
- (h) ensuring that staff and staff representatives are adequately represented and consulted in defining, developing, monitoring and reviewing the safety aspects of all related processes that may involve staff.

2. **Risk management** — *a structured approach to assess risks associated with the maintenance of vehicles, including those directly arising from operational processes and the activities of other organisations or persons, and to identify the appropriate risk control measures*

- 2.1. The organisation shall have procedures and arrangements in place to recognise the need and commitment to collaborate with keepers, railway undertakings, infrastructure managers, designers and manufacturers of vehicles and components or other interested parties.
- 2.2. The organisation shall have risk management procedures to manage changes in the maintenance file, including maintenance plans, equipment, procedures, organisation, staffing or interfaces, and to apply the common safety methods related to the risk evaluation and assessment methods as adopted pursuant to point (a) of Article 6(1) of Directive (EU) 2016/798.
- 2.3. When assessing risk, an organisation shall have procedures to take into account the need to determine, provide and sustain an appropriate working environment which conforms to Union and national legislation, in particular Council Directive 89/391/EEC <sup>(1)</sup>.

3. **Monitoring** — *a structured approach to ensure that risk control measures are in place, working correctly and achieving the organisation's objectives*

- 3.1. The organisation shall have a procedure to regularly collect, monitor and analyse relevant safety data, including:
  - (a) the performance of relevant processes;
  - (b) the results of processes (including all contracted services and products);
  - (c) the effectiveness of risk control arrangements;
  - (d) information on experience, malfunctions, defects and repairs arising from day-to-day operation and maintenance.

<sup>(1)</sup> Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work (OJ L 183, 29.6.1989, p. 1).

- 3.2. The organisation shall have procedures to ensure that accidents, incidents, near-misses and other dangerous occurrences are reported, logged, investigated and analysed.
- 3.3. For a periodic review of all processes, the organisation shall have an internal auditing system which is independent, impartial and acts in a transparent way. This system shall have procedures in place to:
  - (a) develop an internal audit plan, which may be revised depending on the results of previous audits and monitoring of performance;
  - (b) analyse and evaluate the results of the audits;
  - (c) propose and implement specific corrective measures or actions;
  - (d) verify the effectiveness of previous measures or actions.
- 3.4. The procedures mentioned in points 3.1, 3.2 and 3.3 of this Section shall comply with the common safety methods related to the risk evaluation and assessment methods as adopted pursuant to point (a) of Article 6(1) of Directive (EU) 2016/798 and to the methods for assessing the safety level and the safety performance of railway operators at national and Union level as adopted pursuant to point (d) of Article 6(1) of that Directive.

4. **Continuous improvement** — *a structured approach to analyse the information gathered through regular monitoring, auditing, or other relevant sources and to use the results to learn and to adopt preventive or corrective measures in order to maintain or improve the level of safety*

The organisation shall have procedures to ensure that:

- (a) identified shortcomings are rectified;
  - (b) new safety developments are implemented;
  - (c) internal audit findings are used to bring about improvement in the system;
  - (d) preventive or corrective actions are implemented, when needed, to ensure compliance of the railway system with standards and other requirements throughout the lifecycle of equipment and operations;
  - (e) relevant information relating to the investigation and causes of accidents, incidents, near-misses and other dangerous occurrences is used to learn and, where necessary, to adopt measures in order to improve the level of safety;
  - (f) relevant recommendations from the national safety authority, from the national investigation body and from industry or internal investigations are evaluated and implemented if appropriate;
  - (g) relevant reports or information from railway undertakings/infrastructure managers, keepers or other relevant sources are considered and taken into account.
5. **Structure and responsibility** — *a structured approach to define the responsibilities of individuals and teams for secure delivery of the organisation's safety objectives*
- 5.1. The organisation shall have procedures to allocate responsibilities for all relevant processes throughout the organisation.
  - 5.2. The organisation shall have procedures to clearly define safety-related areas of responsibility and the distribution of responsibilities to specific functions associated with them as well as their interfaces. Those include the procedures indicated in point 2.1 above between the organisation and the keepers and, where appropriate, railway undertakings and infrastructure managers.
  - 5.3. The organisation shall have procedures to ensure that staff with delegated responsibilities within the organisation have the authority, competence and appropriate resources to perform their functions. Responsibility and competence shall be coherent and compatible with the given role, and delegations shall be in writing.
  - 5.4. The organisation shall have procedures to ensure the coordination of activities related to relevant processes across the organisation.
  - 5.5. The organisation shall have procedures to hold those with a role in the management of safety accountable for their performance.

6. **Competence management** — *a structured approach to ensure that employees have the competences required in order to achieve the organisation's objectives safely, effectively and efficiently in all circumstances*
- 6.1. The organisation shall set up a competence management system providing for:
- (a) the identification of posts with responsibility for performing within the system all the processes necessary for compliance with the requirements of this Annex;
  - (b) the identification of posts involving safety tasks;
  - (c) the allocation of staff with the appropriate competence to relevant tasks.
- 6.2. Within the organisation's competence management system, there shall be procedures to manage the competence of staff, including at least:
- (a) identification of the knowledge, skills and experience required for safety-related tasks as appropriate for the responsibilities;
  - (b) selection principles, including basic educational level, mental aptitude and physical fitness;
  - (c) initial training and qualification or certification of acquired competence and skills;
  - (d) assurance that all staff are aware of the relevance and importance of their activities and how they contribute to the achievement of safety objectives;
  - (e) ongoing training and periodical updating of existing knowledge and skills;
  - (f) periodic checks of competence, mental aptitude and physical fitness where appropriate;
  - (g) special measures in the case of accidents/incidents or long absences from work, as required.
7. **Information** — *a structured approach to ensure that important information is available to those making judgments and decisions at all levels of the organisation*
- 7.1. The organisation shall have procedures to define reporting channels to ensure that, within the entity itself and in its dealings with other actors, including infrastructure managers, railways undertakings, keepers and designers or manufacturers of vehicles or components, or both, when appropriate, information on all relevant processes is duly exchanged and submitted to the person having the right role both within its own organisation and in other organisations, in a prompt and clear way.
- 7.2. To ensure an adequate exchange of information, the organisation shall have procedures for:
- (a) the receipt and processing of specific information;
  - (b) the identification, generation and dissemination of specific information;
  - (c) making available reliable and up-to-date information.
- 7.3. The organisation shall have procedures to ensure that key operational information is:
- (a) relevant and valid;
  - (b) accurate;
  - (c) complete;
  - (d) appropriately updated;
  - (e) verified;
  - (f) consistent and easy to understand (including the language used);
  - (g) made known to staff in accordance with their responsibilities, before it is applied;
  - (h) easily accessible to staff, with copies provided to them where required.
- 7.4. The requirements set out in points 7.1, 7.2 and 7.3 apply in particular to the following operational information:
- (a) checks of the accuracy and completeness of national vehicle registers regarding the identification (including means) and registration of the vehicles maintained by the organisation;

- (b) maintenance documentation;
- (c) information on support provided to keepers and, where appropriate, to other parties, including railway undertakings/infrastructure managers;
- (d) information on the qualification of staff and subsequent supervision during maintenance development;
- (e) information on operations (including mileage, type and extent of activities, incidents or accidents) and requests of railway undertakings, keepers and infrastructure managers;
- (f) records of maintenance performed, including information on deficiencies detected during inspections and corrective actions taken by railway undertakings or by infrastructure managers such as inspections and monitoring undertaken before the departure of the train or en route;
- (g) release to service and return to operation;
- (h) maintenance orders;
- (i) technical information to be provided to railway undertakings/infrastructure managers and keepers for maintenance instructions;
- (j) emergency information concerning situations where the safe state of running is impaired, which may consist of:
  - (i) the imposition of restrictions of use or specific operating conditions for the vehicles maintained by the organisation or other vehicles of the same series even if maintained by other entities in charge of maintenance, whereby this information shall also be shared with all involved parties;
  - (ii) urgent information on safety-related issues identified during maintenance, such as deficiencies detected in a component common to several categories or series of vehicles;
- (k) all relevant information or data needed to submit the annual maintenance report to the certification body and to the relevant customers (including keepers), whereby this report shall also be made available upon request to national safety authorities.

8. **Documentation** — *a structured approach to ensure the traceability of all relevant information*

- 8.1. The organisation shall have adequate procedures in place to ensure that all relevant processes are duly documented.
- 8.2. The organisation shall have adequate procedures in place to:
  - (a) regularly monitor and update all relevant documentation;
  - (b) format, generate, distribute and verify changes to all relevant documentation;
  - (c) receive, collect and archive all relevant documentation.

9. **Contracting activities** — *a structured approach to ensure that subcontracted activities are managed appropriately in order for the organisation's objectives to be achieved*

- 9.1. The organisation shall have procedures in place to ensure that safety-related products and services are identified.
- 9.2. When making use of contractors or suppliers, or both, for safety-related products and services, the organisation shall have procedures in place to verify at the time of selection that:
  - (a) contractors, subcontractors and suppliers are competent;
  - (b) contractors, subcontractors and suppliers have a maintenance and management system that is adequate and documented.
- 9.3. The organisation shall have a procedure to define the requirements that such contractors and suppliers have to meet.
- 9.4. The organisation shall have procedures to monitor the awareness of suppliers and/or contractors of risks they entail to the organisation's operations.
- 9.5. When the maintenance or management system of a contractor or supplier is certified, the monitoring process described in point 3 may be limited to the results of the contracted operational processes referred to in point 3.1 (b).



9.6. At least the basic principles for the following processes shall be clearly defined, known and allocated in the contract between the contracting parties:

- (a) responsibilities and tasks relating to railway safety issues;
- (b) obligations relating to the transfer of relevant information between both parties;
- (c) the traceability of safety-related documents.

## II. Requirements and assessment criteria for the maintenance development function

1. The organisation shall have a procedure to identify and manage:
  - (a) all maintenance activities affecting safety;
  - (b) all safety-critical components.
2. The organisation shall have procedures to guarantee conformity with the essential requirements for interoperability, including updates throughout the lifecycle, by:
  - (a) ensuring compliance with the specifications related to the basic parameters for interoperability as set out in the relevant technical specifications for interoperability (TSIs);
  - (b) verifying in all circumstances the consistency of the maintenance file with the authorisation related to the vehicle (including any national safety requirements), including the conformity to the technical file and the type of records as in the European Register of Authorised Types of Vehicles (ERATV);
  - (c) managing any substitution in the framework of maintenance;
  - (d) identifying the need for risk assessment of the potential impact of the change in question on the safety of the railway system, by application of the common safety methods related to the risk evaluation and assessment methods as adopted pursuant to point (a) of Article 6(1) of Directive (EU) 2016/798;
  - (e) managing the configuration of all technical changes affecting the system integrity of the vehicle.
3. The organisation shall have a procedure to design and support the implementation of maintenance facilities, equipment and tools specifically developed and required for maintenance delivery. The organisation shall have a procedure to check that these facilities, equipment and tools are used, stored and maintained according to their maintenance schedule and in conformity with their maintenance requirements.
4. When vehicles start operations, the organisation shall have procedures to:
  - (a) obtain access to the recommendations for maintenance of the initial documentation and to collect sufficient information on planned operations;
  - (b) analyse those recommendations for maintenance of the initial documentation and to provide, by application of the common safety methods related to the risk evaluation and assessment methods as adopted pursuant to point (a) of Article 6(1) of Directive (EU) 2016/798, the first maintenance file, also taking into account the information contained in any associated guarantees;
  - (c) ensure that the implementation of the first maintenance file is done accordingly.
5. To keep the maintenance file updated throughout the lifecycle of a vehicle, the organisation shall have procedures to:
  - (a) collect at least the relevant information in relation to:
    - (i) the type and extent of operations effectively performed, including, but not limited to accidents, serious accidents and incidents, as defined in Directive (EU) 2016/798;
    - (ii) the detected failures on components;
    - (iii) the type and extent of operations planned;
    - (iv) the maintenance effectively performed.
  - (b) define the need for updates, taking into account the limit values for interoperability;

- (c) make proposals for and approve changes and their implementation, with a view to a decision based on clear criteria, taking into account the findings from risk assessment performed by application of the common safety methods related to the risk evaluation and assessment methods as adopted pursuant to point (a) of Article 6(1) of Directive (EU) 2016/798;
  - (d) ensure that the implementation of changes is done accordingly;
  - (e) monitor the effectiveness of the changes through a process in consistency with the methods for assessing the safety level and the safety performance of railway operators at national and Union level as adopted pursuant to point (d) of Article 6(1) of Directive (EU) 2016/798.
6. When the competence management process is applied to the maintenance development function, at least the following activities affecting safety shall be taken into account:
- (a) application of the common safety methods related to the risk evaluation and assessment methods as adopted pursuant to point (a) of Article 6(1) of Directive (EU) 2016/798 for assessment of changes of the maintenance file;
  - (b) engineering disciplines required for managing the establishment and the changes of the maintenance file and the development, assessment, validation and approval of substitutions in the framework of maintenance;
  - (c) maintenance activities on safety-critical components;
  - (d) joining techniques (including welding and bonding);
  - (e) non-destructive testing.
7. When the documentation process is applied to the maintenance development function, the traceability of at least the following elements needs to be guaranteed:
- (a) the documentation relating to the development, assessment, validation and approval of a substitution in the framework of maintenance;
  - (b) the configuration of vehicles, including, but not limited to, safety-critical components and on-board software modifications;
  - (c) records of the maintenance performed;
  - (d) results of studies concerning return on experience;
  - (e) all the successive versions of the maintenance file, including risk assessment;
  - (f) reports on the competence and supervision of maintenance delivery and fleet maintenance management;
  - (g) technical information to be provided to support keepers, railway undertakings and infrastructure managers.

### **III. Requirements and assessment criteria for the fleet maintenance management function**

1. The organisation shall have a procedure to check the competence, availability and capability of the entity responsible for maintenance delivery before placing maintenance orders. This requires that the maintenance workshops are duly qualified to decide upon the requirements for technical competences in the maintenance delivery function.
2. The organisation shall have a procedure for the composition of the work package and for the issue and release of the maintenance order.
3. The organisation shall have a procedure to send vehicles for maintenance in due time.
4. The organisation shall have a procedure to manage the removal of vehicles from operation for maintenance or when safe operation is impaired or when needs of maintenance affect the normal operation.
5. The organisation shall have a procedure to define the necessary verification measures applied to the maintenance delivered and the release to service of the vehicles.
6. The organisation shall have a procedure to issue a notice of return to operation, including the definition of restrictions of use to ensure the safe running by taking into account the release to service documentation.

7. When the competence management process is applied to the fleet maintenance management function, at least the return to operation shall be taken into account including defining the restriction of use.
8. When the information process is applied to the fleet maintenance management function, at least the following elements need to be provided to the maintenance delivery function:
  - (a) applicable rules and technical specifications;
  - (b) the maintenance plan for each vehicle;
  - (c) a list of spare parts, including a sufficiently detailed technical description of each part to allow like-for-like replacement with the same guarantees;
  - (d) a list of materials, including a sufficiently detailed description of their use and the necessary health and safety information;
  - (e) a dossier that defines the specifications for activities affecting safety and contains intervention and in-use restrictions for components;
  - (f) a list of components or systems subject to legal requirements and a list of those requirements (including brake reservoirs and tanks for the transport of dangerous goods);
  - (g) application of the common safety methods related to the risk evaluation and assessment methods as adopted pursuant to point (a) of Article 6(1) of Directive (EU) 2016/798 for assessing changes affecting the fleet maintenance management function.
9. When the information process is applied to the fleet maintenance management function, interested parties shall be at least informed of the return to operation, including restrictions on use relevant to users (railway undertakings and infrastructure managers).
10. When the documentation process is applied to the fleet maintenance management function, at least the following elements need to be recorded:
  - (a) maintenance orders;
  - (b) return to operation, including restrictions on use relevant to railway undertakings and infrastructure managers.

#### IV. Requirements and assessment criteria for the maintenance delivery function

1. The organisation shall have procedures to:
  - (a) check the completeness and appropriateness of the information delivered by the fleet maintenance management function in relation to the activities ordered;
  - (b) verify the use of the required, relevant maintenance documents and other standards applicable to the delivery of maintenance services in accordance with maintenance orders;
  - (c) ensure that all relevant maintenance specifications, as defined in applicable regulations and specified standards contained in the maintenance orders, are available to all involved staff (e.g. they are contained in internal working instructions).
2. The organisation shall have procedures to ensure that:
  - (a) components (including spare parts) and materials are used as specified in the maintenance orders and supplier documentation;
  - (b) components and materials are stored, handled and transported in a manner that prevents wear and damage and as specified in the maintenance orders and supplier documentation;
  - (c) all components and materials, including those provided by the customer, comply with relevant national and international rules as well as with the requirements of relevant maintenance orders.
3. The organisation shall have procedures to determine, identify, provide, record and keep available suitable and adequate facilities, equipment and tools to enable it to deliver the maintenance services in accordance with maintenance orders and other applicable specifications, ensuring:
  - (a) the safe delivery of maintenance, including the health and safety of maintenance staff;
  - (b) ergonomics and health protection, also including the interfaces between users and information technology systems or diagnostic equipment.

4. Where necessary to ensure valid results, the organisation shall have procedures to ensure that its measuring equipment is:
  - (a) calibrated or verified at specified intervals, or prior to use, against international, national or industrial measurement standards — where no such standards exist, the basis used for calibration or verification shall be recorded;
  - (b) adjusted or re-adjusted as necessary;
  - (c) identified to enable the calibration status to be determined;
  - (d) safeguarded from adjustments that would invalidate the measurement result;
  - (e) protected from damage and deterioration during handling, maintenance and storage.
5. The organisation shall have procedures to ensure that all facilities, equipment and tools are correctly used, calibrated, preserved and maintained in accordance with documented procedures.
6. The organisation shall have procedures to check that performed tasks are in accordance with the maintenance orders and to issue the notice of release to service. The notice of release to service shall include all information that is useful to define restrictions of use.
7. When the risk assessment process (in particular points 2.2 and 2.3 of Section I) is applied to the maintenance delivery function, the working environment shall include not only the workshops where maintenance is done but also the tracks outside the workshop buildings and all places where maintenance activities are performed.
8. When the competence management process is applied to the maintenance delivery function, at least the following activities affecting safety where appropriate shall be taken into account:
  - (a) joining techniques (including welding and bonding);
  - (b) non-destructive testing;
  - (c) final vehicle testing and release to service;
  - (d) maintenance activities on brake systems, wheel sets and draw gear and maintenance activities on specific components of freight wagons for the transport of dangerous goods, such as tanks, valves, etc.;
  - (e) maintenance activities on safety-critical components;
  - (f) maintenance activities on control-command and signalisation systems;
  - (g) maintenance activities on door control systems;
  - (h) other identified specialist areas affecting safety.
9. When the information process is applied to the maintenance delivery function, at least the following elements shall be provided to the fleet maintenance management and maintenance development functions:
  - (a) works performed in accordance with the maintenance orders;
  - (b) any possible fault or defect regarding safety which is identified by the organisation;
  - (c) the release to service.
10. When the documentation process is applied to the maintenance delivery function, at least the following elements shall be recorded for the maintenance activities affecting safety, as referred to in point 1(a) of Section II:
  - (a) clear identification of all facilities, equipment and tools;
  - (b) all maintenance works performed, including personnel, tools, equipment, spare parts and materials used and taking into account:
    - (i) relevant national rules where the organisation is established;
    - (ii) requirements laid down in the maintenance orders, including requirements regarding records;
    - (iii) final testing and the decision regarding the release to service;

- (c) the control measures required by maintenance orders and the release to service;
  - (d) the results of calibration and verification, whereby, for computer software used in the monitoring and measurement of specified requirements, the ability of the software to perform the desired task shall be confirmed prior to initial use and reconfirmed as necessary;
  - (e) the validity of the previous measuring results when a measuring instrument is found not to conform to requirements.
-

*ANNEX III*

**Application forms**



**APPLICATION FOR A CERTIFICATE OF  
CONFORMITY OF AN ENTITY IN CHARGE OF  
MAINTENANCE**

Application for a certificate confirming that the maintenance system of an entity in charge of maintenance (ECM) is deemed to be in conformity with Directive (EU) 2016/798 of the European Parliament and of the Council and Commission Implementing Regulation (EU) 2019/779

**CERTIFICATION BODY CONTACT INFORMATION**

- 1.1 Name of the certification body addressed for the application \_\_\_\_\_
- 1.2 Certification body reference number \_\_\_\_\_
- 1.3 Complete postal address (street, postal code, city, country) \_\_\_\_\_  
\_\_\_\_\_

**APPLICANT INFORMATION**

- 2.1 Legal title \_\_\_\_\_
- 2.2 Complete postal address (street, postal code, city, country) \_\_\_\_\_  
\_\_\_\_\_
- 2.3 Phone number \_\_\_\_\_ 2.4 Fax number \_\_\_\_\_
- 2.5 Email address \_\_\_\_\_ 2.6 Website \_\_\_\_\_
- 2.7 Registration business number \_\_\_\_\_ 2.8 VAT No \_\_\_\_\_
- 2.9 Other information \_\_\_\_\_

**CONTACT PERSON INFORMATION**

- 3.1 Family name and first name \_\_\_\_\_
- 3.2 Complete postal address (street, postal code, city, country) \_\_\_\_\_  
\_\_\_\_\_
- 3.3 Phone number \_\_\_\_\_ 3.4 Fax number \_\_\_\_\_
- 3.5 Email address \_\_\_\_\_

**APPLICATION DETAILS**

4.1 Application reference (given by the applicant)

**This application is for a**

- 4.2 new certificate  4.3 updated/amended certificate
- 4.4 renewed certificate

**OPERATIONAL DETAILS****5.1 Type of company:**

5.11 RU     5.12 IM     5.13 Keeper     5.14 Maintenance supplier     5.15 Manufacturer     5.16 Other

**5.2 Scope of ECM activities** (category of vehicles: freight wagons, locomotives, multiple units, passenger carriages, high-speed vehicles, OTMs, other — specify):

**5.3 Covers wagons specialised in transport of dangerous goods: YES/NO**

<b>5.4 ECM Operational functions</b>		own	partially	fully outsourced
5.4	Maintenance development	5.4.1 <input type="checkbox"/>	5.4.2 <input type="checkbox"/>	5.4.3 <input type="checkbox"/>
5.5	Fleet maintenance management	5.5.1 <input type="checkbox"/>	5.5.2 <input type="checkbox"/>	5.5.3 <input type="checkbox"/>
5.6	Maintenance delivery	5.6.1 <input type="checkbox"/>	5.6.2 <input type="checkbox"/>	5.6.3 <input type="checkbox"/>

**SUBMITTED DOCUMENTS**

6.1 Maintenance system documentation

6.2 Other  specify: \_\_\_\_\_

**SIGNATURES****Applicant**

\_\_\_\_\_  
(first name, family name)

Date \_\_\_\_\_

Signature \_\_\_\_\_

**Certification body**

Internal reference number

\_\_\_\_\_

Date application received \_\_\_\_\_

Date \_\_\_\_\_

Signature \_\_\_\_\_

SPACE RESERVED FOR THE ADDRESSED  
OFFICE/AUTHORITY





**APPLICATION FOR A CERTIFICATE  
OF CONFORMITY FOR MAINTENANCE FUNCTIONS**

Application for a certificate confirming that the maintenance system within the European Union is deemed to be in conformity with Directive (EU) 2016/798 of the European Parliament and of the Council and Commission Implementing Regulation (EU) 2019/779

**CERTIFICATION BODY CONTACT INFORMATION**

- 1.1 Name of the certification body addressed for the application \_\_\_\_\_
- 1.2 Certification body reference number \_\_\_\_\_
- 1.3 Complete postal address (street, postal code, city, country) \_\_\_\_\_  
\_\_\_\_\_

**APPLICANT INFORMATION**

- 2.1 Legal title \_\_\_\_\_
- 2.2 Complete postal address (street, postal code, city, country) \_\_\_\_\_  
\_\_\_\_\_
- 2.3 Phone number \_\_\_\_\_ 2.4 Fax number \_\_\_\_\_
- 2.5 Email address \_\_\_\_\_ 2.6 Website \_\_\_\_\_
- 2.7 Registration business number \_\_\_\_\_ 2.8 VAT No \_\_\_\_\_
- 2.9 Other information \_\_\_\_\_

**CONTACT PERSON INFORMATION**

- 3.1 Family name and first name \_\_\_\_\_
- 3.2 Complete postal address (street, postal code, city, country) \_\_\_\_\_  
\_\_\_\_\_
- 3.3 Phone number \_\_\_\_\_ 3.4 Fax number \_\_\_\_\_
- 3.5 Email address \_\_\_\_\_

**APPLICATION DETAILS**

4.1 Application reference (given by the applicant)

**This application is for a**

- 4.2 new certificate  4.3 updated/amended certificate
- 4.4 renewed certificate

**OPERATIONAL DETAILS****5.1 Type of company:**

5.11 RU  5.12 IM  5.13 Keeper  5.14 Maintenance supplier  5.15 Manufacturer  5.16 Other

**5.2 Scope of ECM activities** (category of vehicles: freight wagons, locomotives, multiple units, passenger carriages, high-speed vehicles, OTMs, other — specify):

**5.3 Covers wagons specialised in transport of dangerous goods:** YES/NO

**5.4 Maintenance functions**

5.5	Maintenance development	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	Partial	<input type="checkbox"/>
5.6	Fleet maintenance management	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	Partial	<input type="checkbox"/>
5.7	Maintenance delivery	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	Partial	<input type="checkbox"/>

For partial maintenance functions, the sub-functions for which this application is submitted (see list in Annex II to Implementing Regulation (EU) 2019/779):

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**SUBMITTED DOCUMENTS**

6.1 Maintenance system documentation

6.2 Other  specify: \_\_\_\_\_

**SIGNATURES****Applicant**


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(first name, family name)

Date \_\_\_\_\_

Signature \_\_\_\_\_

**Certification body**


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Internal reference number

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Date application received \_\_\_\_\_

Date \_\_\_\_\_

Signature \_\_\_\_\_

SPACE RESERVED FOR THE ADDRESSED  
OFFICE/AUTHORITY

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ANNEX IV

**Certification forms**


**CERTIFICATE OF CONFORMITY OF ENTITY IN CHARGE OF MAINTENANCE**

confirming acceptance of the maintenance system of an entity in charge of maintenance (ECM) within the European Union in conformity with Directive (EU) 2016/798 of the European Parliament and of the Council and Commission Implementing Regulation (EU) 2019/779

<b>1. EIN number</b>	
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**2. CERTIFIED ENTITY IN CHARGE OF MAINTENANCE**

Legal title:	
Commercial designation or acronym (voluntary)	
Complete postal address (street, postal code, city, country)	
Registration business number:	VAT No:

**3. CERTIFICATION BODY**

Legal title:	
Complete postal address (street, postal code, city, country)	
Certification body reference number:	

**4. CERTIFICATE INFORMATION**

This is a	<input type="checkbox"/> — new certificate <input type="checkbox"/> — renewed certificate <input type="checkbox"/> — updated/amended certificate	EIN number of the previous certificate:
Validity from:	to:	
Type of company: (railway undertaking, keeper, maintenance supplier, etc.)		

**5. SCOPE OF ECM ACTIVITIES**

Category of vehicles: (freight wagons, locomotives, multiple units, passenger carriages, high-speed vehicles, OTMs, other)	
Covers wagons specialised in transport of dangerous goods	YES/NO

**6. ADDITIONAL INFORMATION**

Date issued		Signature	
Internal reference number		Certification body's stamp	



### CERTIFICATE OF CONFORMITY FOR MAINTENANCE FUNCTIONS

confirming acceptance of the maintenance system within the European Union in conformity with Directive (EU) 2016/798 of the European Parliament and of the Council and Commission Implementing Regulation (EU) 2019/779

<b>1. EIN number</b>	
----------------------	--

#### 2. CERTIFIED ORGANISATION

Legal title:	
Commercial designation or acronym (voluntary)	
Complete postal address (street, postal code, city, country)	
Registration business number:	VAT No:

#### 3. CERTIFICATION BODY

Legal title:	
Complete postal address (street, postal code, city, country)	
Certification body reference number:	

#### 4. CERTIFICATE INFORMATION

This is a	— new certificate <input type="checkbox"/> — renewed certificate <input type="checkbox"/> — updated/amended certificate <input type="checkbox"/>	Identification number of the previous certificate:
Validity from:	to:	
Type of company: (railway undertaking, keeper, maintenance supplier, etc.)		

#### 5. SCOPE OF MAINTENANCE ACTIVITIES

Category of vehicles: (freight wagons, locomotives, multiple units, passenger carriages, high-speed vehicles, OTMs, other)	
Covers wagons specialised in transport of dangerous goods	YES/NO

#### 6. MAINTENANCE FUNCTIONS

<b>Maintenance development</b>	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
<b>Fleet maintenance management</b>	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
<b>Maintenance delivery</b>	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>

For partial maintenance functions, the sub-functions for which this certificate is valid (see list in Annex II to Implementing Regulation (EU) 2019/779):

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**7. ADDITIONAL INFORMATION**

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Date issued

Signature

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Internal reference number

Certification body's stamp

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## ANNEX V

**Report of the entity in charge of maintenance**

1. The entity in charge of maintenance shall issue a report, which covers a period starting 2 months before the last surveillance and ending 2 months before the next planned surveillance.
  2. The report shall include at least:
    - explanations and justification on how non-conformities have been addressed or solved, or both;
    - information on the volume of maintenance carried out during the prevailing period;
    - the feedback on experience in applying the common safety methods related to the risk evaluation and assessment as adopted pursuant to point (a) of Article 6(1) of Directive (EU) 2016/798 and to the methods for monitoring to be applied by railway undertakings, infrastructure managers and entities in charge of maintenance as adopted pursuant to point (c) of Article 6(1) of that Directive;
    - changes related to:
      - legal ownership of the company;
      - organisation (procedures in place);
      - vehicles for which the entity is in charge of maintenance;
      - sites and contractors including processes and equipment;
      - the balance between internal and external activities related to the three maintenance functions (maintenance development, fleet maintenance and maintenance delivery);
      - contractual arrangements with users (including the keepers and the exchange of data);
      - the maintenance system;
      - defects and failures of components related to safety, referred to in Section II of Annex II, and relevant information about maintenance exchanged pursuant to Article 5(3);
      - internal audit reports;
      - the agency, national safety authorities and other authorities enforcement actions or investigations including claims in accordance with Articles 8 and 12 of this legal act;
      - competence management.
  3. The entity in charge of maintenance shall add to the report all information it considers relevant for the certification body.
  4. The entity in charge of maintenance shall address the report to the certification body 1 month before the next planned audit surveillance.
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# RECOMMENDATIONS

## COMMISSION RECOMMENDATION (EU) 2019/780

of 16 May 2019

**on practical arrangements for issuing safety authorisations to infrastructure managers**

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 292 thereof,

Whereas:

- (1) Article 12 of Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety <sup>(1)</sup> requires the infrastructure managers to obtain a safety authorisation from the national safety authority in the Member State where the rail infrastructure is located in order to be allowed to manage and operate a rail infrastructure. Such a safety authorisation should confirm acceptance of the infrastructure manager's safety management system and include the procedures and provisions fulfilling the requirements necessary for the safe design, maintenance and operation of the railway infrastructure.

On 9 March 2017 the European Union Agency for Railways (the 'Agency') delivered Recommendation ERA-REC-115-REC on the revision of the common safety methods for conformity assessment and the common safety methods on supervision to the Commission. That Recommendation included provisions on practical arrangements for issuing safety authorisations to infrastructure managers.

- (2) At its meeting of 5 July 2017, the Commission Expert Group on the Technical Pillar of the 4th Railway Package suggested to the Commission to incorporate the above-mentioned provisions into a Recommendation, since there is no appropriate legal basis to include them in a Regulation. Such a Recommendation would provide a guidance laying down the practical arrangements for issuing safety authorisations to infrastructure managers. Such a common guidance should reduce the complexity of the national authorisation procedures by laying down common methodology to be used. It could also ensure that the objectives of Article 12 of Directive (EU) 2016/798 are more effectively achieved and facilitate the tasks of coordination which should be carried out by the national safety authorities under that Article. Therefore the Commission recommends to the Member States to follow those provisions.
- (3) In accordance with Article 12(1), the national safety authorities should develop an application guidance document for managing the issuing of safety authorisations, including the procedure to be followed, with a view to reducing administrative burdens and costs for the applicant coming from the administrative processing of the application.
- (4) The time-limits defined by the national safety authorities in respect of producing additional information requested of the applicant or carrying out visits, inspections or audits should be without prejudice to the timeframe allowed for the assessment of an application set out in Article 12(3) of Directive (EU) 2016/798.
- (5) Pursuant to Article 12(5) of Directive (EU) 2016/798, in the case of cross-border infrastructure, the national safety authorities concerned should coordinate their assessment to avoid, as far as possible, any duplication of assessment and to ensure consistency of decisions to be taken for the rail infrastructure located in their respective Member State.

<sup>(1)</sup> OJ L 138, 26.5.2016, p. 102.



- (6) Within the framework of their activities, infrastructure managers may need to use trains, infrastructure inspection vehicles, on-track machines or other special vehicles for different purposes, such as the transport of materials or staff for construction or infrastructure maintenance, the maintenance of its infrastructure assets or the management of emergency situations. In such cases, the infrastructure manager should be deemed to operate in the capacity of a railway undertaking under its safety management system and safety authorisation without the need to apply for a separate single safety certificate, irrespective of whether it owns the vehicles or not.
- (7) It is useful to harmonise for the infrastructure managers the categorisation of issues which may be identified in the course of the assessment process of the application. Such a harmonisation should ensure that the applicant understands the gravity of any issues raised by the national safety authority. That categorisation of issues is particularly relevant for the cooperation between national safety authorities in the case of cross-border infrastructure,

HAS ADOPTED THIS RECOMMENDATION:

#### **SUBJECT MATTER AND SCOPE**

1. This Recommendation lays down guidelines on the assessment of applications submitted by infrastructure managers to national safety authorities for issuing safety authorisations, or for the renewal or update of such authorisations, as provided for in Article 12 of Directive (EU) 2016/798.

#### **DEFINITIONS**

2. For the purposes of this Recommendation, the following definitions should apply:
  - (a) 'date of receipt of the application' means the first working day in the Member State concerned following the acknowledgement of receipt of the application file;
  - (b) 'pre-engagement' means a procedural stage preceding the submission of an application, in the course of which the applicant may request additional information on the following stages of the safety assessment process from the national safety authority;
  - (c) 'residual concern' means a minor issue identified during the assessment of an application for a safety authorisation which does not prevent its issuing and can be deferred for later supervision.

#### **RESPONSIBILITIES OF THE NATIONAL SAFETY AUTHORITY**

3. The national safety authority should be responsible for the planning, implementation and monitoring of the assessment work it carries out related to the issuing of a safety authorisation.
4. The national safety authority should accept pre-engagement at the request of the applicant and provide any clarifications requested by the applicant for the procedure to be followed.
5. For the purposes of issuing safety authorisations, the national safety authority should compile the following information:
  - (a) all relevant information concerning the different stages of the assessment procedure, including the reasons for any decisions taken in the course of that procedure, such as inspections, as well as any restrictions or conditions of use to be included in the safety authorisation;
  - (b) the outcome of the assessment procedure, including summary conclusions and where appropriate, an opinion concerning the issuing of the safety authorisation.
6. The national safety authority should monitor the expiry dates of all valid safety authorisations to facilitate the planning of the safety assessment activities.
7. In order to comply with the third subparagraph of Article 12(1) of Directive (EU) 2016/798, the national safety authority should publish and keep up to date an application guide, including model templates, explaining the requirements for the safety authorisation and the documents required. Those documents should include the national rules that apply to the infrastructure manager and the national procedural provisions. Such a guide should be free of charge and published on the website of the national safety authority concerned. It should also indicate the communication arrangements between the national safety authority and the applicant.

To assist the national safety authorities in this task, the Agency in cooperation with the latter should develop, publish and keep up to date a template of an application guide.

8. The national safety authority should establish internal arrangements or procedures for managing the safety assessment process. Those arrangements or procedures should take into account the need to cooperate with other competent national safety authorities in order to issue a safety authorisation in the case of cross-border infrastructure, as provided for in Article 12(5) of Directive (EU) 2016/798.
9. When assessing applications, the national safety authorities should accept other types of authorisations, certificates and any other relevant document provided by infrastructure managers or their contractors granted in accordance with relevant Union law, as proof of their capacity to fulfil the requirements laid down in Commission Delegated Regulation (EU) 2018/762 <sup>(2)</sup>.

#### SUBMISSION OF AN APPLICATION

10. Without prejudice to the timeframe set out in Article 12(3) of Directive (EU) 2016/798 for the issuing of a decision by the national safety authority, the applicant should submit the application for a safety authorisation, or for the update or renewal of such an authorisation before the following dates, as appropriate:
  - (a) the planned start date of any new rail network operation;
  - (b) the planned start date of a rail network operation under conditions other than those laid down in the current safety authorisation, following a substantial change made to the infrastructure, signalling or energy subsystems or to the principles of their operation and maintenance;
  - (c) the expiry date of the current safety authorisation.
11. When submitting an application for a new safety authorisation, the applicant should provide the information listed in Annex I.
12. When submitting an application for the update or renewal of a safety authorisation, the applicant should provide the information listed in Annex I and describe changes made to its safety management system since the date the current authorisation was issued.

Where such changes may affect safety performance or create serious safety risks, or where the national safety authority identifies any other areas of concern in the framework of its supervision activities, it should decide whether the whole application file needs to be re-assessed.

13. If applicant requests pre-engagement, it should submit the information listed in points 1 to 5 of Annex I to the national safety authority.
14. Where the submitted file contains copies of documents issued by entities other than the national safety authority, the applicant should keep the originals for at least 5 years after the end of the period of validity of the safety authorisation. In the case of renewal or update, the applicant should keep the originals of documents submitted for that application and issued by entities other than the national safety authority for at least 5 years after the end of the period of validity of the renewed or updated safety authorisation. The applicant makes available those original documents at the request of the national safety authority.

#### PROCEDURAL STAGES AND TIMEFRAMES

15. The national safety authority should apply the process set out in Annex II.
16. The national safety authority should evaluate whether the application contains the documents listed in points 6 to 8 of Annex I. It should inform the applicant, without undue delay, and in any case no later than one month following the date of receipt of the application, whether the application is complete.

<sup>(2)</sup> Commission Delegated Regulation (EU) 2018/762 of 8 March 2018 establishing common safety methods on safety management system requirements pursuant to Directive (EU) 2016/798 of the European Parliament and of the Council and repealing Commission Regulations (EU) No 1158/2010 and (EU) No 1169/2010 (OJ L 129, 25.5.2018, p. 26).

17. Where the application is not complete, the national safety authority should promptly request the necessary supplementary information and indicate a reasonable timeframe for the applicant's response. The timeframe for providing supplementary information should be reasonable, proportionate to the difficulty of providing the information requested and agreed with the applicant as soon as it is informed that its application file is not complete. If the applicant does not provide the required information within the agreed timeframe, the national safety authority may decide to extend the timeframe for the applicant's response or to notify the applicant that its application is rejected.
18. Even if the application file is complete, the national safety authority may request from the applicant any further information at any time prior to taking its decision. It should set a reasonable deadline for the provision of such information.
19. The safety authorisation should contain the information listed in Annex III.

A unique identification number should be given to each safety authorisation.

20. In order to fulfill its obligation under Article 12(4) of Directive (EU) 2016/798, the national safety authority should transmit to the Agency the information listed in Annex III.

#### **INFORMATION MANAGEMENT**

21. The national safety authority should register, and regularly update, in an information management system, all relevant information on each stage of the safety assessment process and the outcome of that assessment.

#### **ARRANGEMENTS FOR VISITS AND INSPECTIONS ON THE SITES OF INFRASTRUCTURE MANAGERS AND AUDITS**

22. In the case of visits, inspections or audits carried out by the national safety authority, the applicant should indicate the person to represent it and the applicable site safety rules and procedures that need to be respected by the staff of the national safety authority responsible for carrying out the visit, inspection or audit. The timeframe for visits, inspections and audits should be agreed between the national safety authority and the applicant.
23. In the case of visits, inspections or audits, the national safety authority should draft a report on the issues identified in the course of the assessment and specifying whether they have been solved by evidence provided during the visit, inspection or audit and, if so, how. That report may also include additional issues to be solved by the applicant within an agreed timeframe.

#### **COOPERATION BETWEEN THE NATIONAL SAFETY AUTHORITIES IN CASE OF CROSS-BORDER INFRASTRUCTURES**

24. The applicant or applicants should submit their applications for the cross-border infrastructure with the national safety authorities in the Member States concerned. Each national safety authority concerned should deliver the safety authorisation for relevant infrastructure located in their territory.
25. The national safety authorities should discuss any issues relating to the safety assessment process, and any requests for additional information which have an impact on the timeframe of the assessment or have the potential to affect the work of the other national safety authorities concerned.
26. The national safety authority may require from the other national safety authorities concerned any relevant information related to the applicant.
27. The national safety authorities concerned should exchange among themselves all relevant information which may have an impact on the safety assessment process, including on implementation of relevant national rules, notified to the Commission by their respective Member State.
28. The objectives and scope of audits, inspections and visits, as well as the role assigned to each national safety authority, should be decided by the national safety authorities concerned. The reports of such inspections, visits and audits should be drafted by the national safety authority designed in the framework of the cooperation and be made available to the other national safety authorities concerned.

29. Before deciding on the issuing of a safety authorisation for relevant rail infrastructure located in their respective Member States, the national safety authorities concerned should take the following steps:
  - (a) discuss the outcome of their respective assessments;
  - (b) agree on any residual concerns to be deferred for consideration during later supervision;
  - (c) agree on any restrictions or conditions of use to be included in the safety authorisation, as appropriate.
30. Where the applicant has taken actions to address the identified residual concerns, the national safety authorities concerned should check and agree if those concerns have been solved. To that end, the national safety authorities should cooperate, where appropriate, in accordance with the arrangements referred to in Article 8(2) of Commission Delegated Regulation (EU) 2018/761 <sup>(?)</sup>.
31. The national safety authorities should make the safety authorisation they issue for relevant rail infrastructure located in their respective Member States conditional upon the issuance of all other safety authorisations related to the concerned cross-border infrastructure.
32. The national safety authorities should keep records of their respective activities and make them available to other national safety authorities concerned.

#### CATEGORISATION OF ISSUES

33. The national safety authority should categorise issues identified in the course of its assessment of the application file as follows:
  - (a) 'Type 1': issues that require a response from the applicant for the understanding of the application file;
  - (b) 'Type 2': issues that may lead to an amendment of the application file or minor action from the applicant; the action to be taken is left to the judgement of the applicant and does not prevent the issuing of the safety authorisation;
  - (c) 'Type 3': issues that require specific action to be taken by the applicant, completion of which may be postponed until after the safety authorisation is granted; action to resolve an issue is proposed by the applicant and is agreed with the national safety authority that identified the issue;
  - (d) 'Type 4': issues that require an amendment of the application file or specific action to be taken by the applicant; the safety authorisation is not granted unless the issue is resolved or restrictions or conditions of use are included in the safety authorisation to address the issue; any action to resolve an issue is proposed by the applicant and agreed with the national safety authority that identified the issue.
34. Following the response or the action taken by the applicant according to the issue, the national safety authority should re-evaluate the issues it identified, re-classifies them where relevant and assigns one of the following statuses for each of the issues identified:
  - (a) 'Issue pending' if the evidence provided by the applicant is not satisfactory and additional information is still required;
  - (b) 'Residual concern for supervision' if a residual concern still exists;
  - (c) 'Issue closed out' if the applicant's response is satisfactory and no residual concern remains.

#### COMPETENCE OF THE STAFF INVOLVED IN ASSESSMENTS

35. The national safety authority should ensure that staff involved in assessments have the following competencies:
  - (a) knowledge of the relevant regulatory framework;
  - (b) knowledge of the functioning of the railway system;

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<sup>(?)</sup> Commission Delegated Regulation (EU) 2018/761 of 16 February 2018 establishing common safety methods for supervision by national safety authorities after the issue of a single safety certificate or a safety authorisation pursuant to Directive (EU) 2016/798 of the European Parliament and of the Council and repealing Commission Regulation (EU) No 1077/2012 (OJ L 129, 25.5.2018, p. 16).

- (c) appropriate level of critical analysis;
- (d) experience in the assessment of a safety or similar management system in the railway sector, or a safety management system in a sector with equivalent operational and technical challenges;
- (e) problem solving, communication and team working;
- (f) any other competency required by a particular assessment.

In the case of team work, the competencies may be shared amongst the team members.

Staff carrying out inspections and audits should also demonstrate knowledge of, and experience in interviewing skills.

36. With a view to ensuring the correct application of point 35, the national safety authority should put into place a competence management system which includes:
- (a) the development of competence profiles for each job, position or role;
  - (b) the recruitment of staff in accordance with the established competence profiles;
  - (c) the maintenance, development and assessment of staff competence in accordance with the established competence profiles.

#### REVIEW

37. Any decision refusing the issuing of a safety authorisation or identifying restrictions or conditions of use other than those requested in the application should be duly justified.
38. Member States should ensure that the applicants may request, within a reasonable timeframe, the review of the decision of the national safety authorities and that the national safety authorities have sufficient time from the date of receipt of the request for review in which to confirm or reverse their decisions.
39. The review procedure should be carried out impartially.
40. The review procedure should focus on the issues which had justified the deviation of the decision of the national safety authority from the applicant's request.
41. In the case of cross-border infrastructure, the review should be carried out in coordination with the national safety authorities concerned with the cross-border infrastructure.
42. If the decision refusing the issuing of a safety authorisation or identifying restrictions or conditions of use other than those requested in the application is confirmed, the applicant may bring an appeal before the competent jurisdiction in accordance with national law.

#### FINAL PROVISIONS

43. Member States that have not notified the Agency and the Commission in accordance with Article 33(2) of Directive (EU) 2016/798 are requested to give effect to this Recommendation from 16 June 2019. All Member States are requested to give effect from 16 June 2020.

Done at Brussels, 16 May 2019.

*For the Commission*  
Violeta BULC  
*Member of the Commission*

## ANNEX I

**Content of the application for a safety authorisation**

*Note:* National safety authorities are encouraged to require all information listed in this Annex, including the documents to be annexed to the application, except where indicated with 'O' (optional). Where the infrastructure manager needs to establish a corrective action plan referred to in point 8, the information about it is mandatory.

**1. Type of application:**

- 1.1. New
- 1.2. Renewal
- 1.3. Update
- 1.4. Identification number of the previous authorisation (only in case of application for renewal or update)

**2. Particulars of infrastructure(s)** (*select one or more*)

- 2.1. Trans-European Transport Network (TEN-T)
  - 2.1.1. TEN-T Comprehensive Network
  - 2.1.2. TEN-T Core Freight Network
  - 2.1.3. TEN-T Core Passenger Network
  - 2.1.4. Outside TEN-T Network
- 2.2. Energy
  - 2.2.1. Overhead contact line
  - 2.2.2. Third Rail
  - 2.2.3. Fourth rail
  - 2.2.4. Not electrified
- 2.3. Control-Command and signalling
  - 2.3.1. Class A System
  - 2.3.2. Class B System
- 2.4. Other (specify)

**3. Rail network operations:**

- 3.1. Expected date of starting services/operations (O)
- 3.2. Member State(s) where the infrastructure is located

**4. Information concerning the applicant:**

- 4.1. Legal denomination
- 4.2. Acronym (O)
- 4.3. Complete postal address
- 4.4. Phone
- 4.5. Fax (O)
- 4.6. E-mail
- 4.7. Website (O)

- 4.8. National registration number
- 4.9. VAT number (O)
- 4.10. Other relevant information (O)
5. **Contact person information:**
  - 5.1. First name
  - 5.2. Surname
  - 5.3. Title or function
  - 5.4. Complete postal address
  - 5.5. Phone
  - 5.6. Fax (O)
  - 5.7. E-mail
  - 5.8. Language or languages spoken

DOCUMENTS TO BE ANNEXED TO THE APPLICATION

6. **Documents submitted for the safety management system part of the assessment:**
    - 6.1. Description of the safety management system and other documents demonstrating compliance with the requirements set out in Annex II of Delegated Regulation (EU) 2018/762.
    - 6.2. Information cross-referencing the safety management system (see point 6.1) against Annex II of Delegated Regulation (EU) 2018/762, including an indication where in the safety management system documentation the relevant requirements of the applicable technical specification for interoperability relating to the operation and traffic management subsystem are met.
  7. **Documents submitted for the national part of the assessment:**
    - 7.1. Description or other demonstration of how the safety management arrangements address the relevant national rules notified in accordance with Article 8 of Directive (EU) 2016/798.
    - 7.2. Information cross-referencing the safety management system (see point 6.1) against the requirements laid down in the relevant national rules (referred to in point 7.1).
  8. **Corrective action plan(s)**
    - 8.1. The current status of the action plan or plans established by the infrastructure manager to resolve any major non-compliance and any other area of concern identified during supervision activities since the previous assessment.
    - 8.2. The current status of the action plan or plans established by the infrastructure manager to resolve residual concerns from the previous assessment.
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## ANNEX II

**Safety assessment process**

## 1. GENERAL

- 1.1. National safety authority should develop a structured and auditable process for the complete activity which takes into account the elements set out in this Annex. The safety assessment process should be iterative, as shown in the diagram below (see Figure 1 in the Appendix), that is the national safety authority is entitled to make reasonable requests for further information or re-submission in accordance with this recommendation.

## 2. RECEIPT OF APPLICATION

- 2.1. After receiving an application for a safety authorisation, the national safety authority should formally and promptly acknowledge receipt of the application and sets up the registered file in order to ensure information management at each stage of the assessment process.

- 2.2. The national safety authority should assign competent resources to deliver the assessment process.

## 3. INITIAL SCREEN

- 3.1. On receipt of the application, the national safety authority should undertake promptly an initial screen to check the following elements:

- (a) the applicant has provided the basic information which is either required by the legislation or needed for it to be processed effectively;
- (b) the application file contains sufficient evidence and is structured and internally cross-referenced so that it can be properly assessed against the safety management system requirements and relevant notified national rules. The national safety authority conducts an initial review of the actual content of the evidence contained in the application to make an initial judgement on the quality, sufficiency and appropriateness of the safety management system;
- (c) if applicable, the current status of the action plan (or plans) established by the infrastructure manager to resolve any major non-compliance and any other area of concern identified during supervision activities since the previous assessment is included;
- (d) if applicable, the current status of the action plan (or plans) established by the infrastructure manager to resolve residual concerns from previous assessment is included.

- 3.2. Following the initial screening referred to in point 3.1, the national safety authority should decide if there are any areas in which, for their respective part, further information is necessary. Where further information is necessary, the national safety authority should promptly seek the information, to the extent that they deem reasonably necessary to support their assessment.

- 3.3. The national safety authority should read a sufficient sample of the application to check that its content is understandable. If it is clearly not, the national safety authority should decide whether it needs to be returned, with a request for an improved version.

- 3.4. When assessing the infrastructure manager's capacity to operate trains, infrastructure inspection vehicles, on-track machines or other special vehicles, including the use of contractors where relevant, the national safety authority should refer to the relevant requirements defined in Annex I of Delegated Regulation (EU) 2018/762, in particular its points 1, 5.1, 5.2 and 5.5.

## 4. DETAILED ASSESSMENT

- 4.1. After the completion of the initial screen stage, the national safety authority should proceed to the detailed assessment of the application file (see Figure 2 in the Appendix), using the safety management system requirements and relevant notified national rules.



- 4.2. In undertaking the detailed assessment referred to in point 4.1, in accordance with Article 18(1) of Directive (EU) 2016/798, the national safety authority should exercise professional judgment, be impartial and proportionate, and provide documented reasons for conclusions reached.
- 4.3. The assessment determines whether the safety management system requirements and relevant notified national rules are met or whether further information is needed. During the assessment the national safety authority should also seek evidence that the safety management system requirements and relevant notified national rules have been met from the outputs of the safety management system processes, using sampling methods where appropriate, to ensure that the applicant has understood and can meet the requirements according to the type of the railway operations in order to ensure safe operation of the railway.
- 4.4. Any type 4 issue should be resolved to the satisfaction of the national safety authority leading to an update of the application file where appropriate before the safety authorisation can be issued.
- 4.5. Residual concerns may be deferred for consideration to supervision, or actions may be agreed upon with the applicant, based on its proposal for updating the application file, or both. In such a case formal resolution of the issue takes place after the issue of the safety authorisation.
- 4.6. The national safety authority should be transparent on how it judges the severity of each identified issue.
- 4.7. When identifying an issue referred to in point 33, the national safety authority should be specific and help the applicant understand the level of detail expected in the response. To that end, the national safety authority should take the following steps:
  - (a) refer accurately to the relevant safety management system requirements and notified national rules and help the applicant to understand the identified issues;
  - (b) identify the relevant part of related regulations and rules;
  - (c) state why the individual safety management system requirement or notified national rule, including any related legislation, is not met;
  - (d) agree with the applicant on further commitments, documents and any other supporting information to be provided, as required by the level of detail of the safety management system requirement or the notified national rule;
  - (e) specify and agree with the applicant on a timeframe for compliance, reasonable and proportionate to the difficulty of providing the information requested.
- 4.8. In application of Article 12(3) of Directive (EU) 2016/798, if the applicant significantly delays providing the requested information, the national safety authority should decide to extend the timeframe for the applicant's response or to reject the application after notice.
- 4.9. The timeframe for taking the decision on the issuing of the safety authorisation may only be extended, until the requested information has been submitted, upon decision of the national safety authority and with the agreement of the applicant in one of the following cases:
  - (a) type 1 issues that, considered individually or collectively, prevent the assessment or parts of it from continuing;
  - (b) type 4 issues or multiple type 3 issues that, considered collectively, may raise the category to a type 4 issue, preventing the issuing of the safety authorisation.
- 4.10. To be satisfactory, the applicant's written responses should be sufficient to allay the concerns expressed and to demonstrate that its proposed arrangements will meet the relevant criteria or notified national rules.
- 4.11. Where a response is considered unsatisfactory, it should be explained precisely why, identifying the further information or demonstration required of the applicant to make it satisfactory.
- 4.12. If concerns emerge that the application could be rejected, or that it will take a longer time to reach a decision than the timeframe allowed for the assessment, the national safety authority may consider possible contingency measures.

- 4.13. When it is concluded that either the application meets all requirements or that further progress in securing satisfactory responses to outstanding matters is unlikely, the national safety authority should complete the assessment by the following steps:
- (a) stating whether all criteria have been met or whether there are still matters outstanding;
  - (b) identifying any residual concern;
  - (c) identifying any restriction or condition of use to be included in the safety authorisation;
  - (d) reporting on the follow-up of major non-compliances identified during supervision activities, as referred to in Article 5 of Delegated Regulation (EU) 2018/761, where appropriate;
  - (e) ensuring that the safety assessment process has been correctly applied;
  - (f) compiling the outcome of the assessment, including summary conclusions and where appropriate, an opinion concerning the issuing of the safety authorisation.
- 4.14. The national safety authority should record and justify in writing all findings and judgments in order to facilitate both the assurance process and the decision-making process, as well as to assist with any appeal against the decision to issue the safety authorisation or to reject the application.

## 5. DECISION-MAKING

- 5.1. Based on the conclusions of the completed assessment, a decision should be made on whether to issue a safety authorisation or to reject the application. Where a safety authorisation is to be issued, some residual concerns may be identified. A safety authorisation is not issued where any type 4 issue is identified and not resolved during the assessment.
- 5.2. The national safety authority may decide to restrict the scope of the safety authorisation, by identifying restrictions or conditions of use, if such restrictions or conditions of use address any type 4 issue that would prevent the issue of the safety authorisation. The safety authorisation should be updated on request of the applicant after all residual concerns have been addressed in its application file.
- 5.3. The applicant should be informed about the decision of the national safety authority, including the outcome of the assessment, and a safety authorisation is issued as appropriate.
- 5.4. If the application is rejected or if the safety authorisation contains restrictions or conditions of use other than those defined in the application, the national safety authority should inform the applicant, giving the reasons for the decision, and notify it of the procedure to request a review of or to appeal against the decision.

## 6. CLOSING ASSESSMENT

- 6.1. The national safety authority should complete the administrative closure by ensuring that all documents and records are reviewed, organised and archived. To continually improve its process, the national safety authority should identify historic information and lessons learned for use by future assessments.

## 7. SPECIFIC PROVISIONS FOR THE RENEWAL OF A SAFETY AUTHORISATION

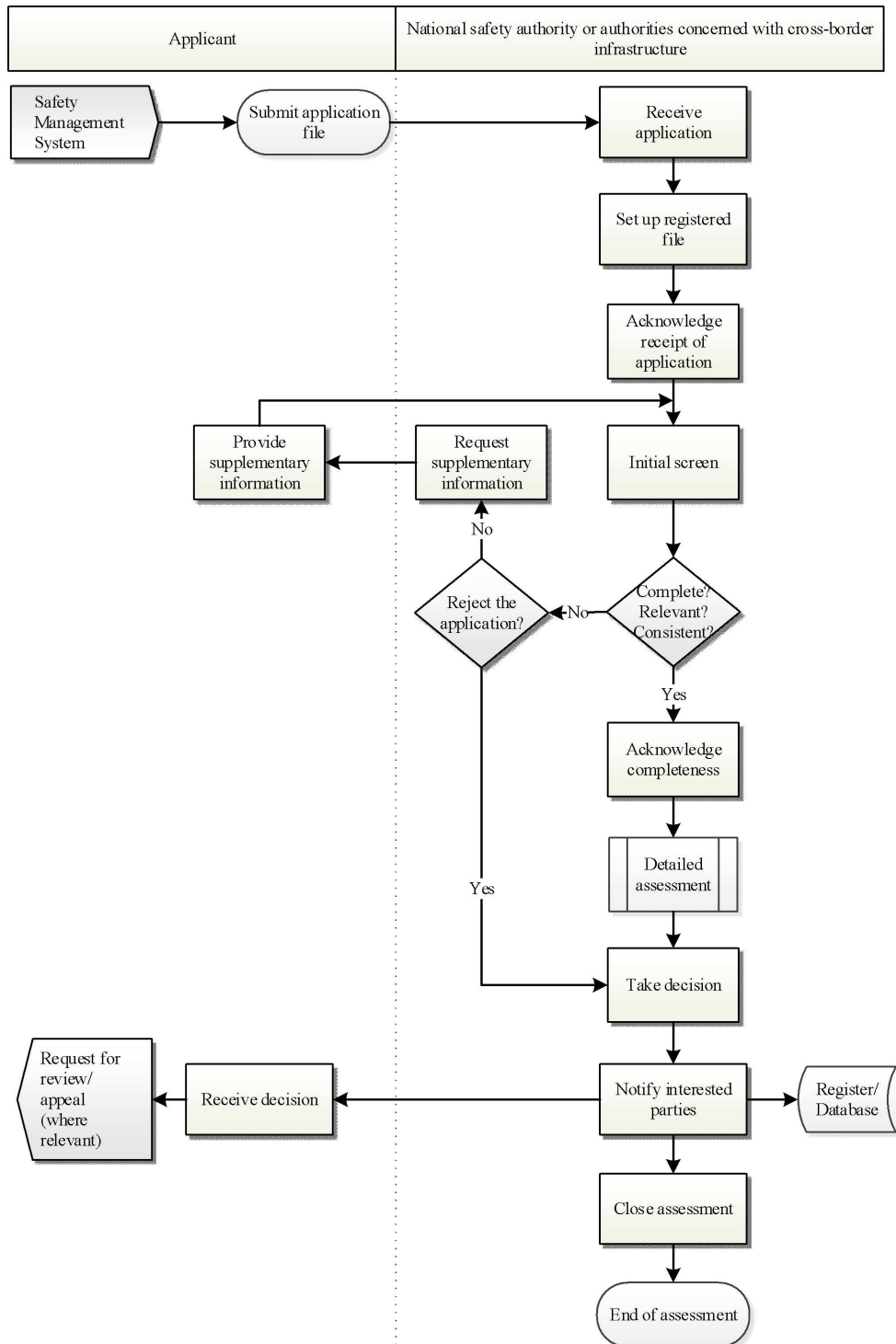
- 7.1. A safety authorisation may be renewed upon request of the applicant before the expiry of its validity to ensure continuity of authorisation.
- 7.2. In the case of a renewal application, the national safety authority should check details of changes to the evidence submitted in the previous application and consider the results of past supervision activities as referred to in Article 5 of Delegated Regulation (EU) 2018/761 to prioritise or target the relevant safety management system requirements and notified national rules upon which to assess the renewal application.
- 7.3. The national safety authority should take a proportionate approach to re-assessment, based on the degree of changes proposed.

8. SPECIFIC PROVISIONS FOR THE UPDATE OF A SAFETY AUTHORISATION
- 8.1. A safety authorisation is updated whenever there is a substantial change proposed to the infrastructure, the signalling, any energy supply used in connection with the infrastructure or the principles of operation and maintenance of such infrastructure, signalling or energy supply in accordance with Article 12(2) of Directive (EU) 2016/798.
- 8.2. Where it intends to make any change referred to in point 8.1, the infrastructure manager holding the safety authorisation notifies the national safety authority without delay.
- 8.3. Following the notification by the infrastructure manager as referred to in point 8.2, the national safety authority:
- (a) checks that the change relating to any potential application is clearly described and that potential safety risks are assessed;
  - (b) discusses with the infrastructure manager the need for an update of the safety authorisation.
- 8.4. The national safety authority may make further enquiries with the applicant. Where the national safety authority agrees that the proposed change is not substantial, it informs the applicant in writing that an update is not required, keeping a record of the decision for the registered file.
- 8.5. In the case of an application for an update, the national safety authority should take the following steps:
- (a) check details of changes to the evidence submitted in the previous application upon which the current safety authorisation was issued;
  - (b) consider the results of past supervision activities as referred to in Article 5 of Delegated Regulation (EU) 2018/761, and in particular, issues relating to the ability of the applicant to effectively implement and monitor its change management process;
  - (c) prioritise or target the relevant safety management system requirements and notified national rules in order to assess the update application.
- 8.6. The national safety authority should take a proportionate approach to re-assessment, based on the degree of changes proposed.
- 8.7. An application to the national safety authority to update a safety authorisation should not lead to the extension of its validity period.
- 8.8. The national safety authority should decide at the request of the applicant whether the safety authorisation needs to be updated where the conditions under which the safety authorisation was issued are to be changed without any impact on the infrastructure, the signalling, any energy supply used in connection with the infrastructure or the principles of operation and maintenance of such infrastructure, signalling or energy supply.
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Appendix

SAFETY ASSESSMENT PROCESS

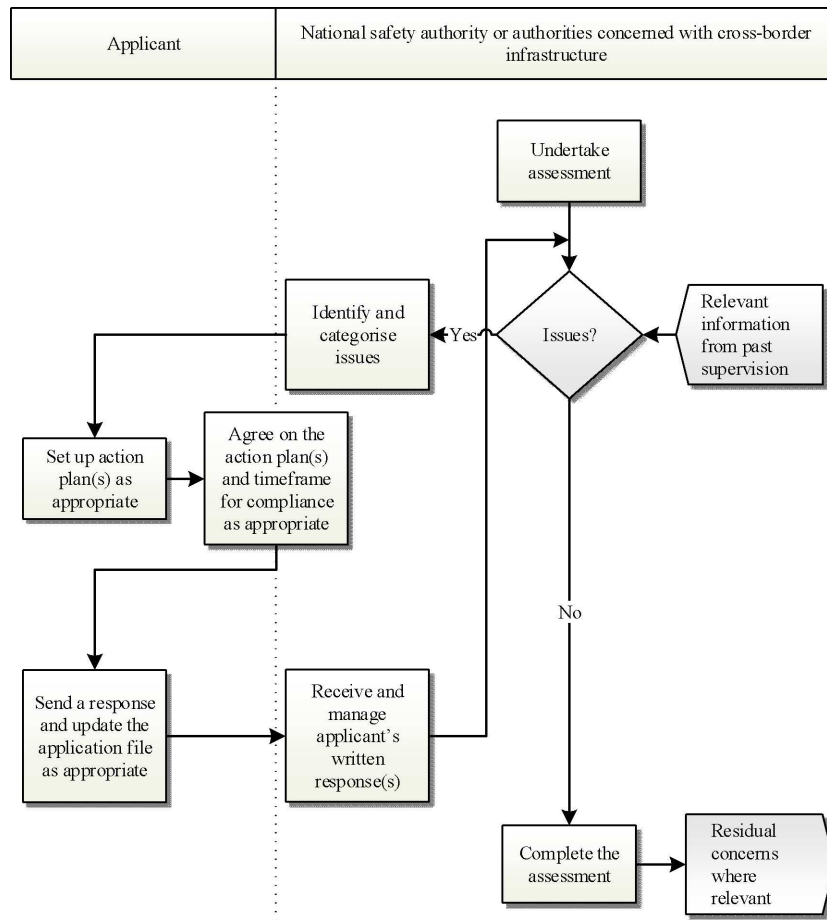
Figure 1  
Safety assessment process



DETAILED ASSESSMENT PROCESS

Figure 2

Detailed assessment process



## ANNEX III

**Content of the safety authorisation**

1. **Identification number of the safety authorisation**
  2. **Identification of the infrastructure manager:**
    - 2.1. Legal denomination
    - 2.2. National registration number
    - 2.3. VAT number
  3. **Identification of the national safety authority:**
    - 3.1. Organisation
    - 3.2. Member State
  4. **Authorisation information:**
    - 4.1. New
    - 4.2. Renewal
    - 4.3. Update
    - 4.4. Identification number of the previous authorisation (in case of renewal or update only)
    - 4.5. Validity start and end dates
    - 4.6. Particulars of infrastructure(s)
  5. **Applicable national legislation**
  6. **Restrictions and conditions of use**
  7. **Additional information**
  8. **Issuing date and authorised signatory/stamp of the authority**
-

## Appendix

The following standard model for safety authorisation is recommended:

**SAFETY AUTHORISATION**

Safety Authorisation confirming acceptance of the safety management system within the European Union in conformity with Directive (EU) 2016/798 and applicable national legislation

**IDENTIFICATION NUMBER:** \_\_\_\_\_

**1. AUTHORISED INFRASTRUCTURE MANAGER**

Legal denomination:	
Infrastructure manager name:	Acronym:
National registration number:	VAT No:

**2. AUTHORITY ISSUING AUTHORISATION**

Authority:
Member State:

**3. AUTHORISATION INFORMATION**

This is a <ul style="list-style-type: none"> <li>— new authorisation <input type="checkbox"/></li> <li>— renewed authorisation <input type="checkbox"/></li> <li>— updated authorisation <input type="checkbox"/></li> </ul>	EU Identification Number of the previous authorisation: _____
Validity from: _____ to: _____	
Particulars of infrastructure(s): _____	

**4. APPLICABLE NATIONAL LEGISLATION**

--

**5. RESTRICTIONS AND CONDITIONS OF USE**

--

**6. ADDITIONAL INFORMATION**

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Date issued

--

Signature

\_\_\_\_\_

Internal reference number

--

Authority's stamp

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\_\_\_\_\_







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