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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

(Text with EEA relevance)

(OJ L 139I, 27.5.2019, p. 5)

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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

(Text with EEA relevance)

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 ([1]), 2008/231/EC ([2]), 2011/314/EU ([3]) 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;

([1]) 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).

([2]) 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).

([3]) 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).

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(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.

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.

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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 and that have not notified the Agency and the Commission in accordance with Article 57(2a) of Directive (EU) 2016/797.

Section 4.2.2.5 and Appendix D1 of the Annex to this Regulation shall apply from 31 October 2020 in the Member States that have notified the Agency and the Commission in accordance with Article 57(2a) of Directive (EU) 2016/797.

▼B

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.

▼B

ANNEX

TABLE OF CONTENTS

1. Introduction

1.1. Technical scope

1.2. Geographical scope

1.3. Content of this Regulation

2. Description of scope

2.1. Staff and trains

2.2. Principles

2.3. Applicability to existing non TSI conform vehicles and infrastructure

3. Essential requirements

3.1. Compliance with the essential requirements

3.2. Essential requirements — overview

4. Characteristics of the subsystem

4.1. Introduction

4.2. Functional and technical specifications of the subsystem

4.2.1. Specifications relating to staff

4.2.1.1. General requirements

4.2.1.2. Documentation for drivers

4.2.1.2.1. Driver's Rule Book

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

4.2.1.2.2.1. Preparation of the Route Book

4.2.1.2.2.2. Modifications to information contained within the Route Book

4.2.1.2.2.3. Informing the driver in real time

4.2.1.2.3. Timetables

4.2.1.2.4. Rolling stock

4.2.1.3. Documentation for railway undertaking staff other than drivers

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

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

4.2.2. Specifications relating to trains

4.2.2.1. Train visibility

4.2.2.1.1. General requirement

4.2.2.1.2. Front-end

4.2.2.1.3. Rear end

▼B

4.2.2.1.3.1. Passenger trains

4.2.2.1.3.2. Freight trains

4.2.2.2. Train audibility

4.2.2.2.1. General requirement

4.2.2.2.2. Control

4.2.2.3. Vehicle identification

4.2.2.4. Safety of passengers and load

4.2.2.4.1. Safety of load

4.2.2.4.2. Safety of passengers

4.2.2.5. Route compatibility and train composition

4.2.2.5.1. Route compatibility

4.2.2.5.2. Train composition

4.2.2.6. Train braking

4.2.2.6.1. Minimum requirements of the braking system

4.2.2.6.2. Braking performance and maximum speed allowed

4.2.2.7. Ensuring that the train is in running order

4.2.2.7.1. General requirement

4.2.2.7.2. Pre-departure data

4.2.2.8. Requirements for signal and lineside marker sighting

4.2.2.9. Driver vigilance

4.2.3. Specifications relating to train operations

4.2.3.1. Train planning

4.2.3.2. Identification of trains

4.2.3.2.1. Format of train running number

4.2.3.3. Train departure

4.2.3.3.1. Checks and tests before departure

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

4.2.3.4. Traffic management

4.2.3.4.1. General requirements

4.2.3.4.2. Train reporting

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

4.2.3.4.3. Dangerous goods

4.2.3.4.4. Operational quality

4.2.3.5. Data recording

4.2.3.5.1. Recording of supervision data outside the train

▼B

4.2.3.5.2. Recording of supervision data on-board the train

4.2.3.6. Degraded operation

4.2.3.6.1. Advice to other users

4.2.3.6.2. Advice to train drivers

4.2.3.6.3. Contingency arrangements

4.2.3.7. Managing an emergency situation

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

4.3. Functional and technical specifications of the interfaces

4.3.1. Interfaces with the infrastructure TSI (INF TSI)

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

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)

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

4.3.4. Interfaces with the Energy TSI (ENE TSI)

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

4.3.6. Interfaces with the Noise TSI (NOI TSI)

4.3.7. Interfaces with the Person with Reduced Mobility TSI (PRM TSI)

4.4. Operating rules

4.4.1. European Union railway system operational principles and rules

4.4.2. National rules

4.4.3. Acceptable Means of Compliance

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

4.5. Maintenance rules

4.6. Professional competences

4.6.1. Professional competence

4.6.2. Language competence

4.6.2.1. Principles

4.6.2.2. Level of knowledge

4.6.3. Initial and ongoing assessment of staff

4.6.3.1. Basic elements

4.6.3.2. Analysis and update of training needs

4.6.4. Auxiliary staff

▼B

4.7. Health and safety conditions

4.7.1. Introduction

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

4.7.2.1.2. Psychological assessment

4.7.2.2. After appointment

4.7.2.2.1. Frequency of periodic medical examinations

4.7.2.2.2. Minimum content of the periodic medical examination

4.7.2.2.3. Additional medical examinations and/or psychological assessments

4.7.3. Medical requirements

4.7.3.1. General requirements

4.7.3.2. Vision requirements

4.7.3.3. Hearing requirements

4.8. Additional information on infrastructure and vehicles

4.8.1. Infrastructure

4.8.2. Rolling stock

5. Interoperability constituents

5.1. Definition

5.2. List of constituents

6. Assessment of conformity and/or suitability for use of the constituents and verification of the subsystem

6.1. Interoperability constituents

6.2. Operation and traffic management subsystem

6.2.1. Principles

7. Implementation

7.1. Principles

7.2. Specific cases

7.2.1. Introduction

7.2.2. List of specific cases

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

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

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

▼B

7.2.2.4. Permanent specific case (P) Finland

Appendix A ERTMS/ETCS operational rules

Appendix B Common operational principles and rules

Appendix C Safety related communications methodology

Appendix D Route compatibility and Route Book

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

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

Appendix E Language and communication level

Appendix F Minimum elements relevant to professional qualification for the tasks associated with ‘accompanying trains’

Appendix G Minimum elements relevant to professional qualification for the task of preparing trains

Appendix H European Vehicle Number and linked alphabetical marking on the bodywork

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

Appendix J Glossary

▼B

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.

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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 ([1]).

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.

([1]) 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).

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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		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	

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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
4.2.1.3	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		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			
4.2.2.5.2	Train composition																	X			

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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
4.2.2.6	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 lineside 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 infra-structure 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	

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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
4.2.3.4.3	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		
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			

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4. CHARACTERISTICS OF THE SUBSYSTEM

4.1. **Introduction**

In accordance with Directive 2012/34/EU of the European Parliament and of the Council ([2]), 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.

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.

([2]) 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).

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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.

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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 ([3]), 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.

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.

([3]) 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).

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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).

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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

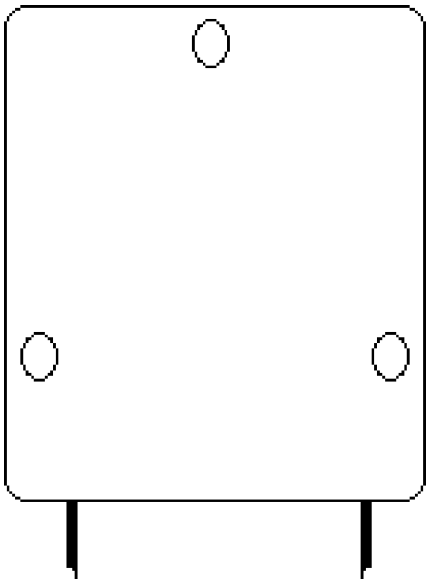
4.2.2.1.1. *General requirement*

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.



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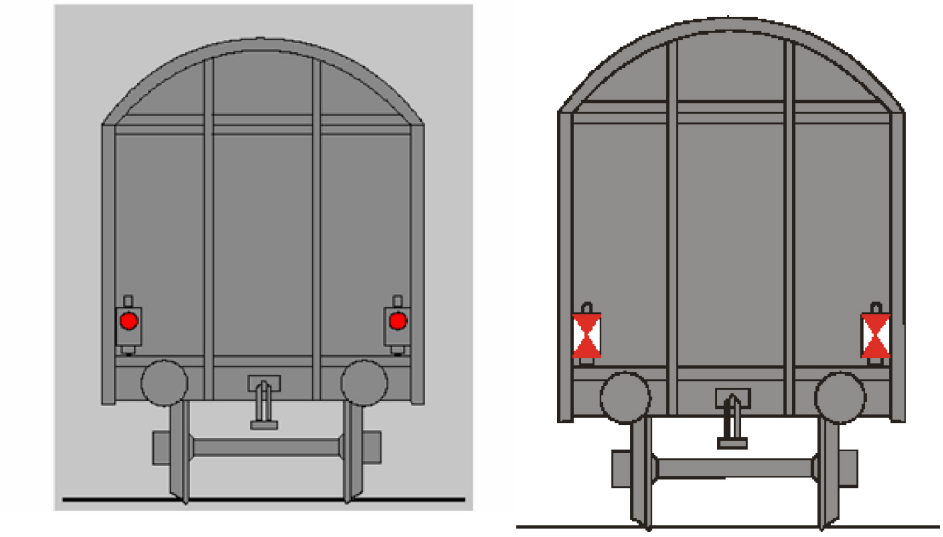
The front-end lights shall optimise train detectability (marker lights), provide sufficient visibility for the train driver (head lights) by night and during low light conditions and shall not dazzle the drivers of oncoming trains.

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 ([4]) (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.

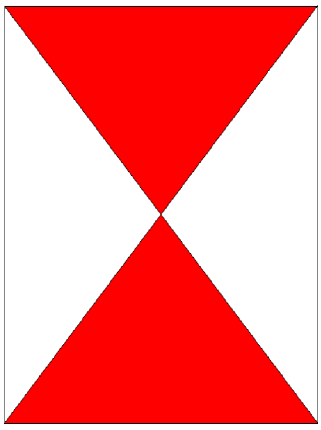
4.2.2.1.3.2. Freight trains

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:

([4]) 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).

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

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 ►M1 31 December 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.

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Phasing out:

The following deadlines shall apply for accepting freight trains equipped with two reflective plates:

(1) From 1 January 2022, along the rail freight corridors specified in accordance with Regulation (EU) No 913/2010, with the following exceptions on the lines where steady red lights are an operational requirement for ensuring safety:

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(a) 1 January 2026 for Belgium and France;

(b) 1 January 2025 for Portugal and Spain.

(2) From 1 January 2026, in the whole European Union rail network.

Member States concerned by the exceptions under (1) (a) and (b) shall provide, by 1 March 2022 at the latest, the Commission with a detailed action plan and precise targets ensuring the elimination of the requirement for red lights as rear end signals. Every 6 months thereafter, those Member States shall provide the Commission with a report on progress made on the use of reflective plates on their network with the aim of Union-level harmonisation of rear end signals by 1 January 2026. Stakeholders shall provide all necessary input to allow Member States to fulfil their reporting duty.

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.

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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.

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.

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The route compatibility process shall not duplicate processes performed as part of the vehicle authorisation under Commission Implementing Regulation (EU) 2018/545 ([5]) 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.

(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.

([5]) 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).

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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).

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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 others 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.

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(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.

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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 ([6]))

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).

([6]) 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).

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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.

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 ([7]) (Telematics Applications for Freight — TAF TSI) and Commission Regulation (EU) No 454/2011 ([8]) (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

([7]) 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).

([8]) 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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(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 ([9]) and Directive 2010/35/EU of the European Parliament and of the Council ([10]), 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.

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.

([9]) 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).

([10]) 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).

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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;

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— 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.

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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:

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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	4.2.1.2.1	Operating rules (normal and degraded conditions)	4.4
Operating rules	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	4.2.12
		GSM-R DMI	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

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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 windscreen	4.2.9.2.2
		Internal lighting	4.2.9.1.8
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

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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		

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Reference this Regulation		Reference SRT TSI	
Parameter	Point	Parameter	Point
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* ([11])*, Person with Reduced Mobility TSI (PRM TSI)*

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

([11]) 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).

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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 ([12]). 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);

— 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.

([12]) 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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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.

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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 ([13]) or Commission Regulations (EU) No 1158/2010 ([14]) and (EU) No 1169/2010 ([15]).

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.

([13]) 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).

([14]) 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).

([15]) 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).

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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.

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.

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(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.

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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.

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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.

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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:

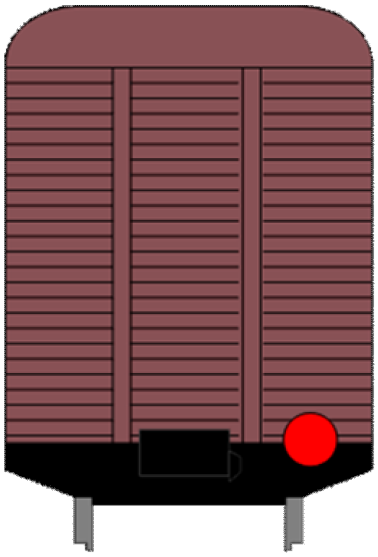
(a) the provisions apply either permanently (case ‘P’), or temporarily (case ‘T’).

(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.

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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 ([1]).

([1]) Published on the ERA website (www.era.europa.eu).

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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.

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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.

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(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.

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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 infra-structure; 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.

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(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.

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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.

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— 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.

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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.

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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).

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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);

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(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.

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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.

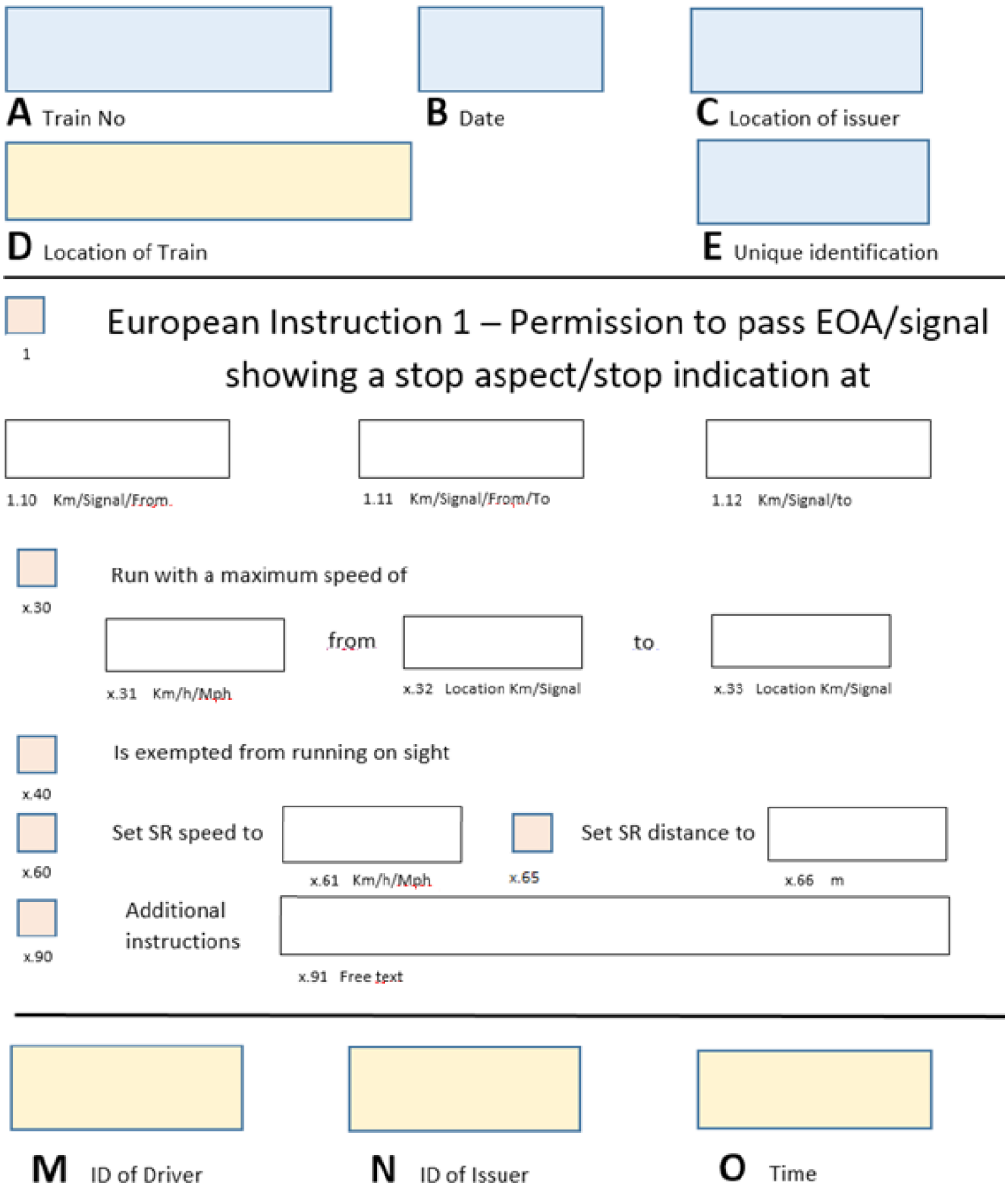
6. **European instructions**

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

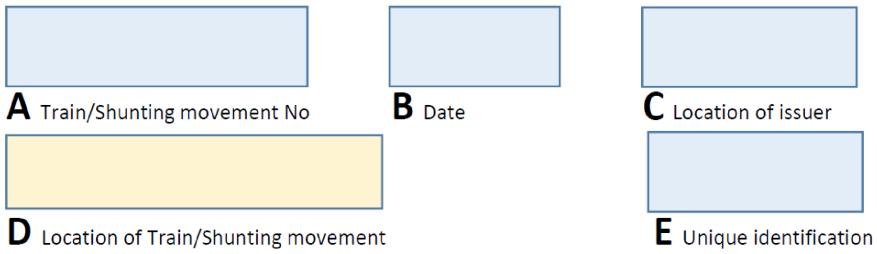
While the content and the identifiers shall be used, the format itself is indicative.

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.

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A Train No
B Date
C Location of issuer
D Location of Train
E Unique identification
1
European Instruction 1 – Permission to pass EOA/signal showing a stop aspect/stop indication at
1.10 Km/Signal/From
1.11 Km/Signal/From/To
1.12 Km/Signal/to
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
x.40
Is exempted from running on sight
x.60
Set SR speed to
x.61 Km/h/Mph
x.65
Set SR distance to
x.66 m
x.90
Additional instructions
x.91 Free text
M ID of Driver
N ID of Issuer
O Time

▼B



European Instruction 2 – Permission to proceed after a TRIP

2

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

2.11 Select SH

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

x.40 Is exempted from running on sight

x.45 Examine the line for the following reason

x.46 Free text

x.50 Report findings to

x.51 Free text

x.60 Set SR speed to

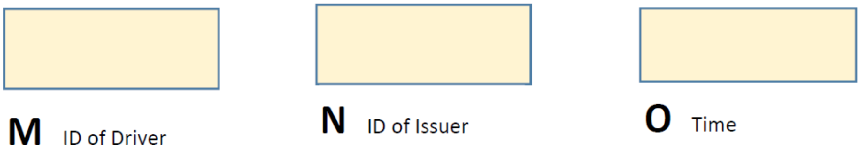
x.61 Kmh/Mph

x.65 Set SR distance to

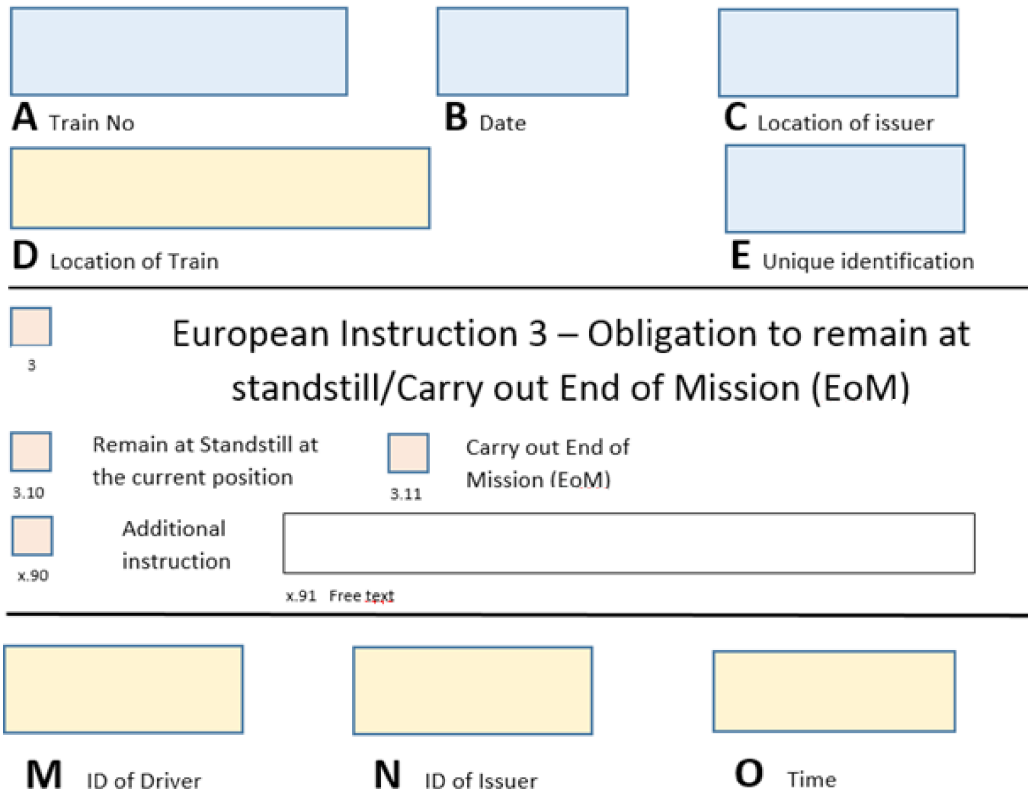
x.66 m

x.90 Additional instruction

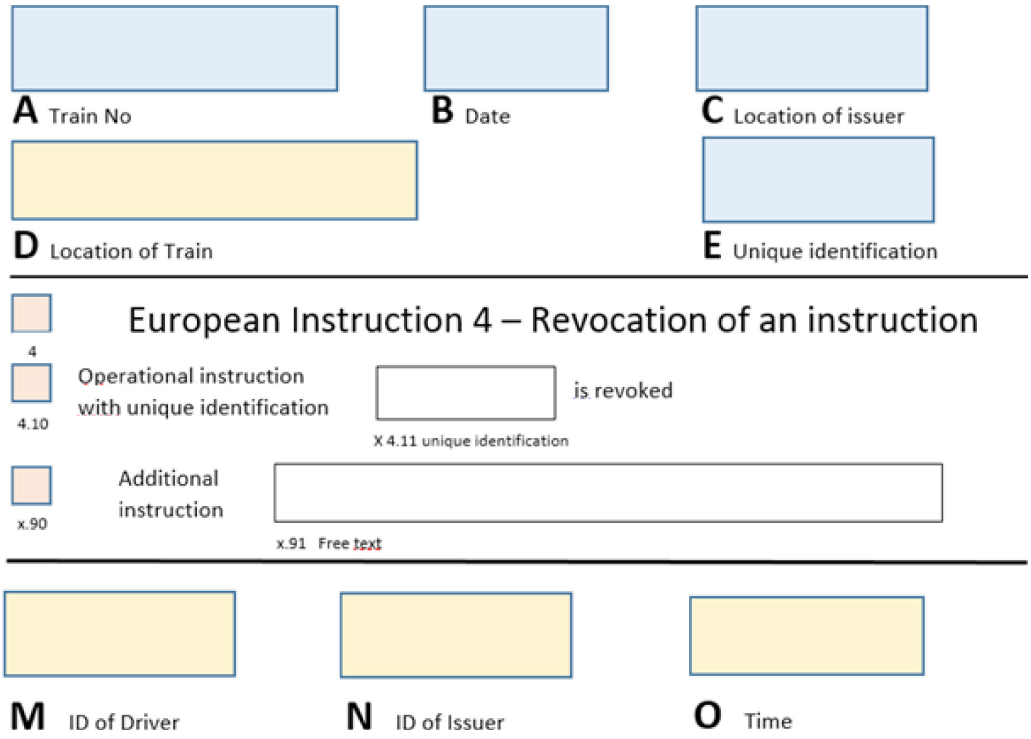
x.91 Free text



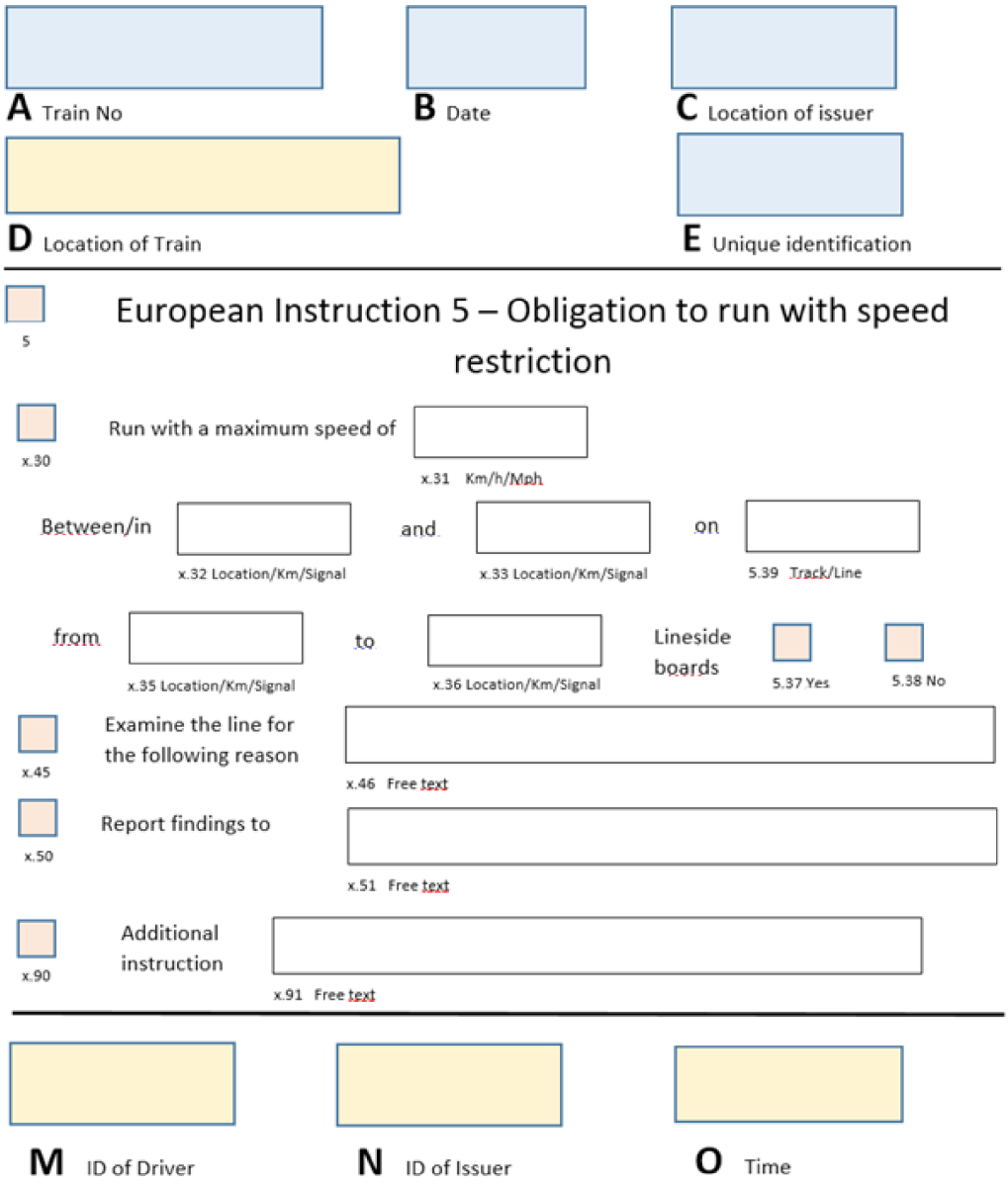
▼B


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

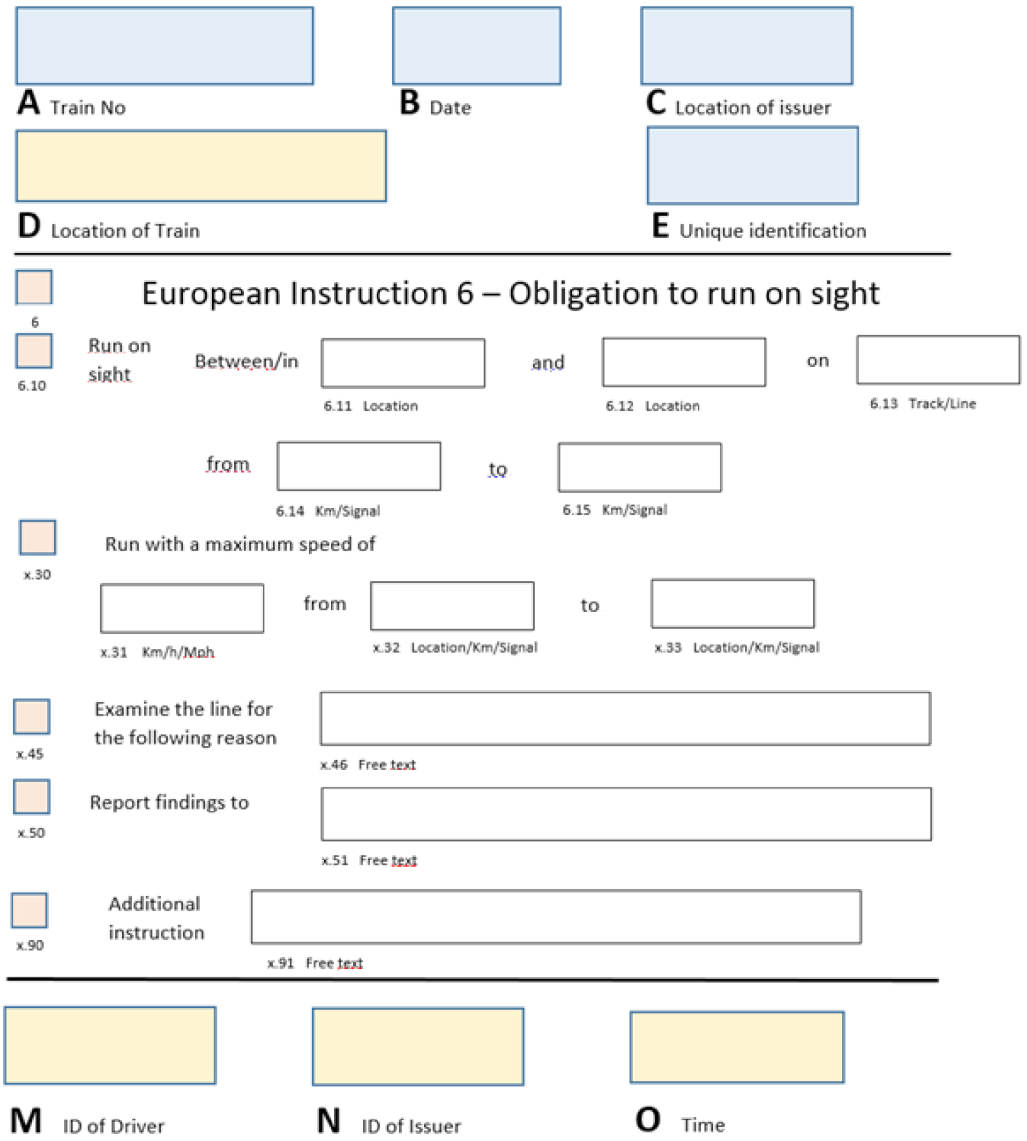
▼B


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
4.10
is revoked
X 4.11 unique identification
Additional instruction
x.90
x.91 Free text
M ID of Driver
N ID of Issuer
O Time

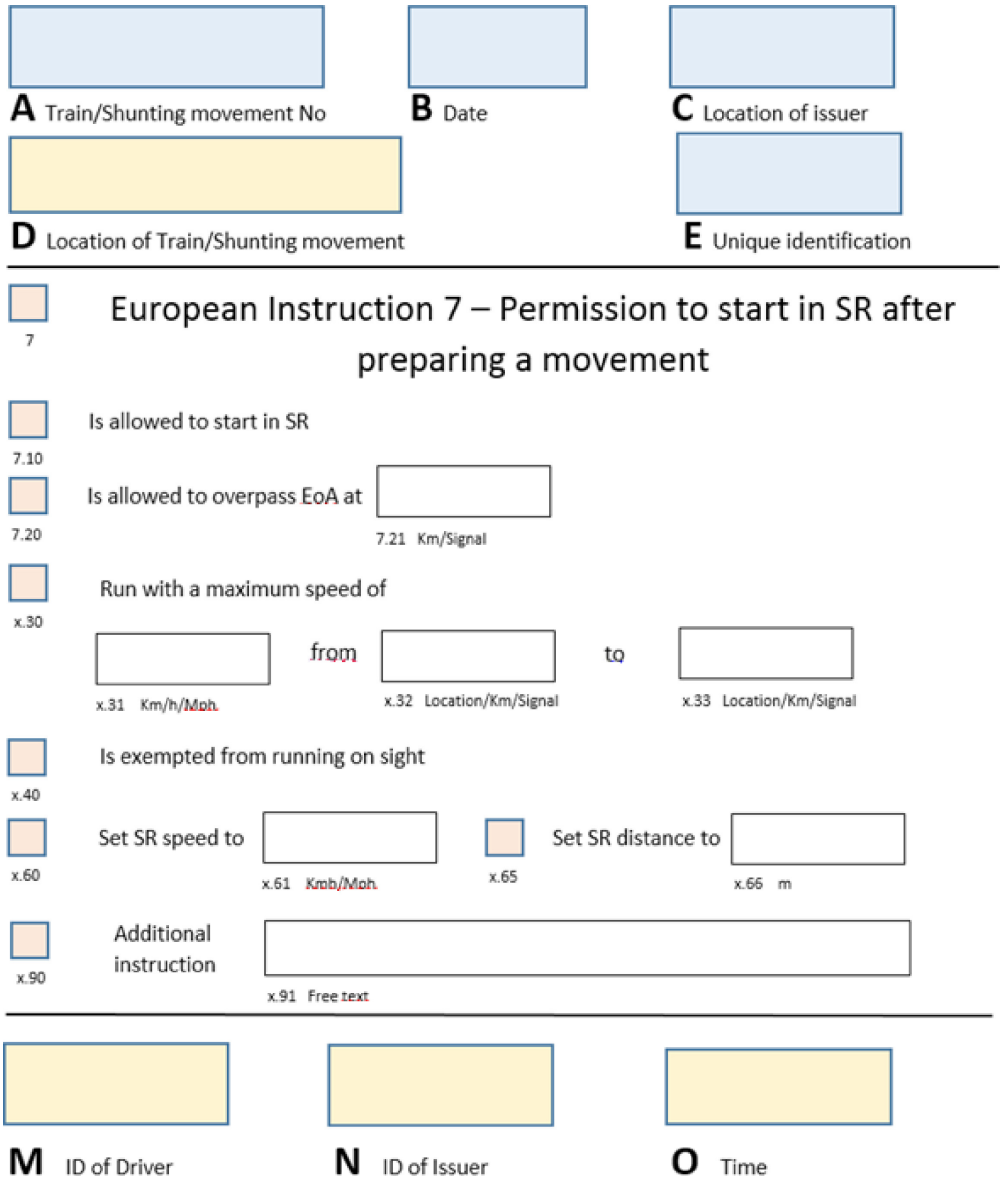
▼B


A Train No
B Date
C Location of issuer
D Location of Train
E 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
M ID of Driver
N ID of Issuer
O Time

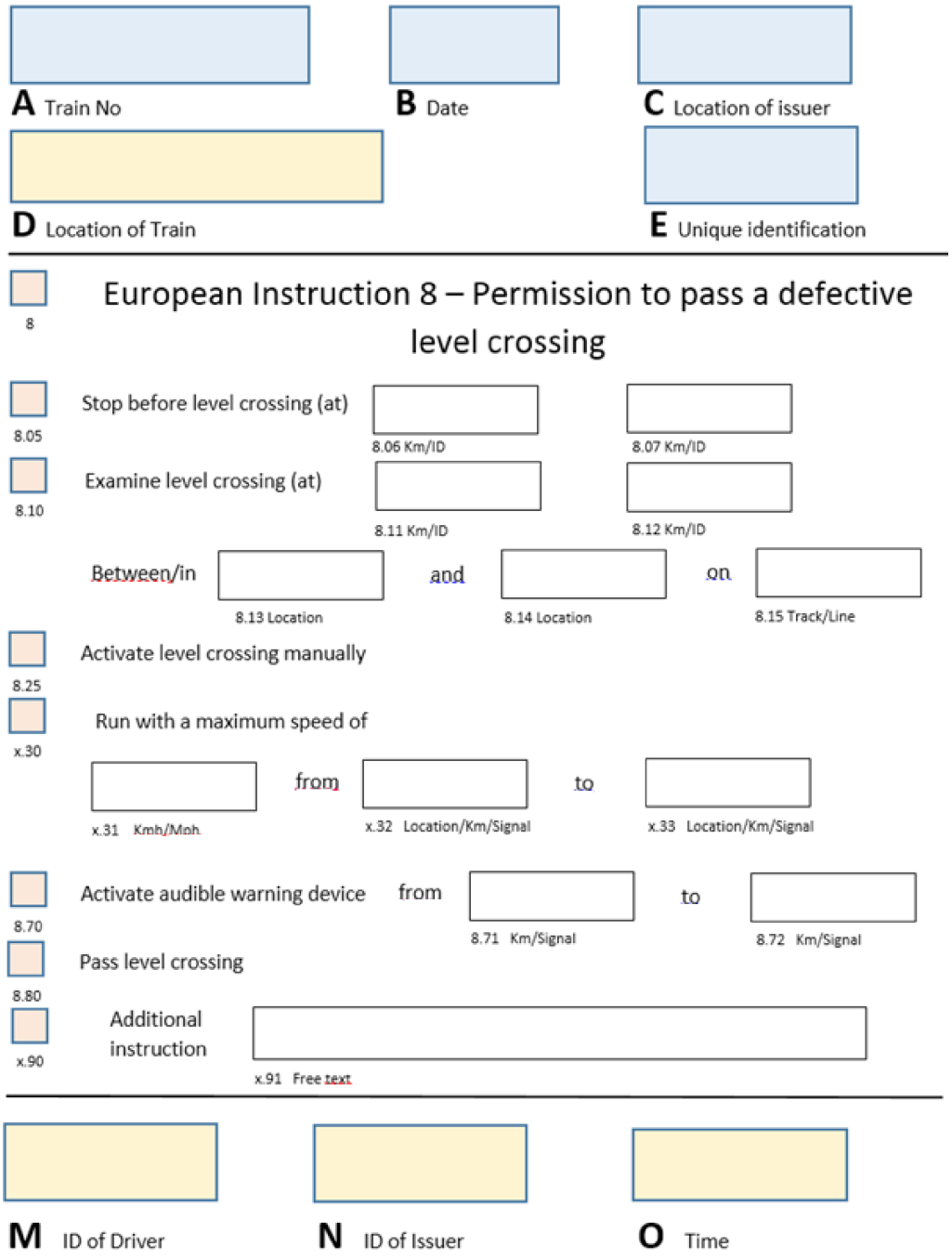
▼B


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
6.11 Location
and
6.12 Location
on
6.13 Track/Line
from
6.14 Km/Signal
to
6.15 Km/Signal
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
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

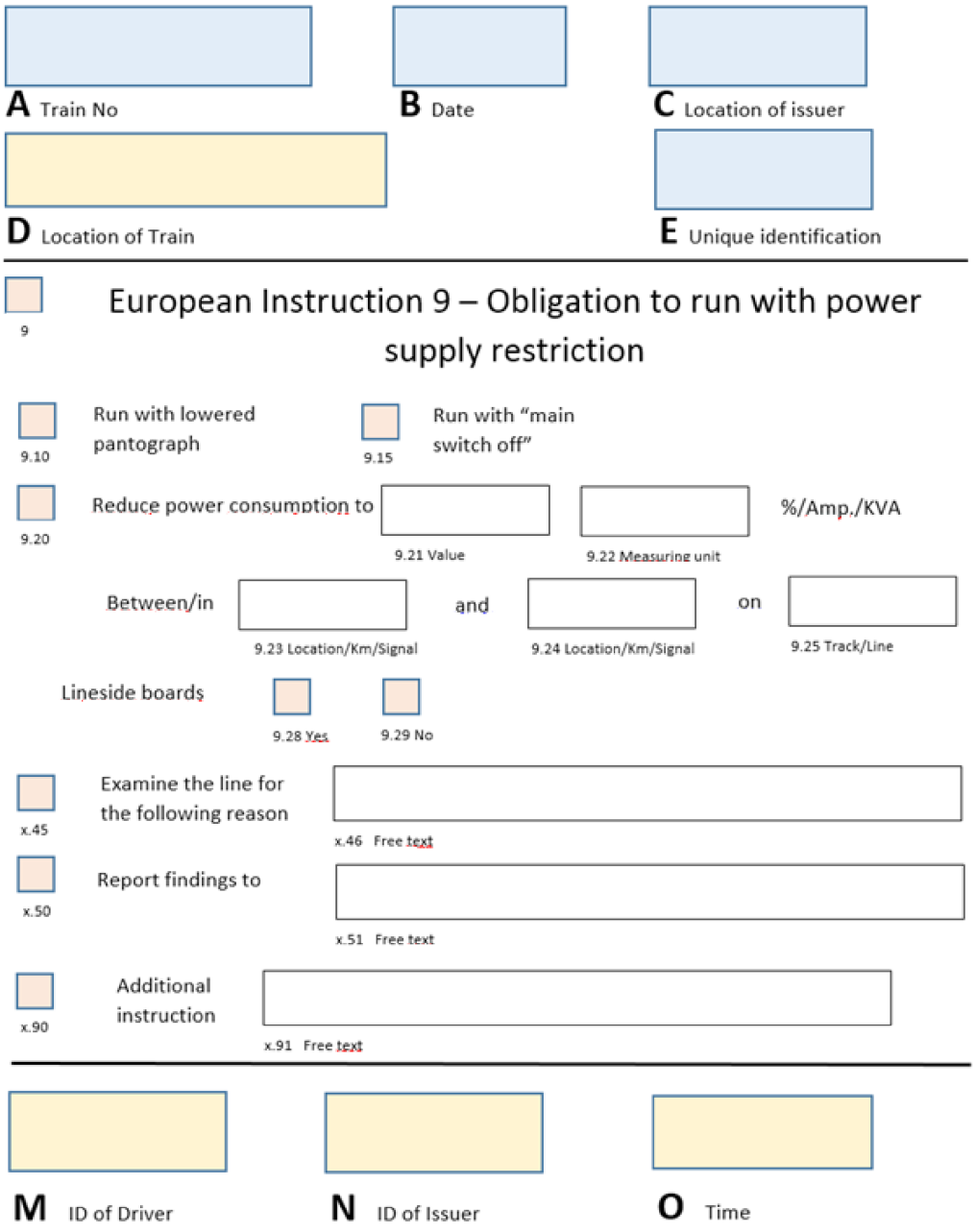
▼B


A Train/Shunting movement No
B Date
C Location of issuer
D Location of Train/Shunting movement
E Unique identification
7
European Instruction 7 – Permission to start in SR after preparing a movement
7.10
Is allowed to start in SR
7.20
Is allowed to overpass EoA at
7.21 Km/Signal
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
x.40
Is exempted from running on sight
x.60
Set SR speed to
x.61 Kmh/Mph
x.65
Set SR distance to
x.66 m
x.90
Additional instruction
x.91 Free text
M ID of Driver
N ID of Issuer
O Time

▼B


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 Kmh/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

▼B


A Train No
B Date
C Location of issuer
D Location of Train
E Unique identification
9
European Instruction 9 – Obligation to run with power supply restriction
9.10
Run with lowered pantograph
9.15
Run with "main switch off"
9.20
Reduce power consumption to
9.21 Value
9.22 Measuring unit
%/Amp./KVA
Between/in
9.23 Location/Km/Signal
and
9.24 Location/Km/Signal
on
9.25 Track/Line
Lineside boards
9.28 Yes
9.29 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
M ID of Driver
N ID of Issuer
O Time

▼B

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.

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Appendix D

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 needs 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	Static axle loads and design and operational masses in the following load cases: — design mass as defined in Regulation (EU) No 1302/2014 — in working order; — under normal payload; — under exceptional payload; — Where relevant operational mass in accordance with EN 15663: 2017- A1 2018: — in working order; — under normal payload. Maximum design speed;	1.1.1.1.2.4 Load capability 1.1.1.1.2.4.1 National classification for load capability 1.1.1.1.2.4.2 Compliance of structures with the High Speed Load Model (HSLM) 1.1.1.1.2.4.3 Railway location of structures requiring specific checks 1.1.1.1.2.4.4 Document(s) with the procedure(s) for static and dynamic route compatibility checks	x	x	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. **For freight wagons:** 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]).

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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
	Vehicle length; The position of the axles along the unit (axle spacing). Static compatibility check for Wagons: Permissible payload for different line categories according to WAG TSI.				
Gauging	Vehicle gauge: — Reference profiles for which the vehicle was authorised; — other gauges assessed.	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). *Note:* Additional discussion between Infrastructure Manager and Railway Undertaking might be needed for checking these specific points.
Vertical radius	Minimum vertical: — convex curve radius capability — concave curve radius capability	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.

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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
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. *Note:* 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.
Hot axle box detection	Axle bearing condition monitoring (hot axles box detection)	1.1.1.1.7.4 Existence of trackside Hot axle box detection Specific to the French, Italian and Swedish networks: 1.1.1.1.7.5 Trackside Hot axle box detection TSI compliant: (Y/N), If No: — 1.1.1.1.7.6 Identification of trackside hot axle box detection; — 1.1.1.1.7.7 Generation of trackside hot axle box detection; — 1.1.1.1.7.8 Railway location of trackside hot axle box detection; — 1.1.1.1.7.9 Direction of measurement of trackside hot axle box detection	X		**For existing non-TSI compliant vehicle:** 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. *Note:* For TSI compliant vehicle: Compatibility with tracksides 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.

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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
Running characteristics	Combination(s) of maximum speed and maximum cant deficiency to which the vehicle was authorised (operational envelope that the vehicle has been assessed for); Rail inclination.	1.1.1.1.4.2 Cant deficiency 1.1.1.1.2.5 Maximum permitted speed 1.1.1.1.4.3 Rail inclination	X		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. 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. *Note:* 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).
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.

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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
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	**For pre-defined formation (as referred in section 2.2.1 of TSI 1302/2014):** 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. **For general operation (*):** 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. *Note:* RINF or information provided by Infrastructure Manager, indicates location of change in km, gradient length can be calculated by extracting data.

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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. *Note:* 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. *Notes:* 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. *Notes:* 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).

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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	Temperature range	1.1.1.1.2.6 Temperature range	X		Comparison of the declared temperature range between vehicle and the intended route. *Note:* The Safety Management System of the Railway Undertaking shall consider any possible restrictions when the compared temperature range diverge.
Weather conditions	Snow, ice and hail condition	1.1.1.1.2.8 Existence of severe climatic conditions	X		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. *Note:* 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.
Voltages and frequencies	Energy supply system: — Nominal voltage and frequency; — Type of contact line system — 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.	1.1.1.2.2.1.1 Type of contact line system 1.1.1.2.2.1.2 Energy supply system (Voltage and frequency) 1.1.1.2.2.1.2.1 Energy supply system TSI compliant Specific cases defined in TSI ENE 1301/2014 section 7.4.2.2.1: 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 (2).	X		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.

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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
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		Verification if the use of the regenerative brake is allowed in the intended route or under specific conditions. *Note:* 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).
Current limitation	Electric units equipped with power or current limitation function.	1.1.1.2.5.1 Current or power limitation on board	X		Verification if the intended route require that the vehicle is equipped with a current or power limitation. *Note:* TSI-compliant Rolling Stock with a maximum power higher than 2MW are equipped with current or power limitation.
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.

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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	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: **For TSI-Compliant vehicle intended to operate in Non-TSI conform line(s):** comparison of mean contact force between the vehicle and the intended route, for each voltage. **For existing non TSI-compliant vehicle:** comparison of the mean contact between vehicle and the intended route, for each voltage. *Note:* A TSI-compliant vehicle is authorised with a mean contact force within limits values defined in EN 50367:2012 Table 6.
Pantograph	Number of pantographs in contact with the overhead contact line (OCL) (for each energy supply system the vehicle is equipped for); 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); 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).	1.1.1.2.3.3 Requirements for number of raised pantographs and spacing between them, at the given speed	X	X	**For pre-defined formation (as referred in section 2.2.1 of TSI 1302/2014):** For each energy supply system: — Comparison of number of vehicle pantographs in contact with the OCL and the intended route; — Comparison of the vehicle shortest distance between two pantographs in contact with the OCL and the intended route. **For general operation (*):** Covered by Railway Undertaking safety management system, considering the conditions imposed by the Infrastructure Manager, as in RINF or information provided by Infrastructure Manager.

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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
					Note: 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).
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	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. Where there is incompatibility, the signboard is to be moved and be settled far enough to ensure drivers do not raise pantographs too early.
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	X		Comparison between fire safety category of vehicle and intended route.

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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
		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			
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	**For fixed and pre-defined formation (as referred in section 2.2.1 of TSI 1302/2014):** Comparison of unit(s) length (single or multiple operation) with the 'siding and platform' length(s) of the intended route. **For general operation** (*)**:** Verification of the composed train length with the 'siding and platform' length(s) of the intended route. *Note:* 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.
Platform height and access and egress	Platform heights for which the vehicle is designed	1.2.1.0.6.5 Height of platform	X		Comparison of platform heights between the vehicle and the intended route. *Note:* 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.

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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.

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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
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

([1]) 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).

([2]) 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).

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

Number	Route Book
1	**Generic information regarding the infrastructure manager**
1.1	infrastructure manager's Name
2	**Maps and Diagrams**
2.1	**Map: schematic overview including**
2.1.1	Line sections
2.1.2	Principal locations (stations, yards, junctions, freight terminals)
2.2	**Line diagram**
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	**Station/Yard/Depot diagrams**
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	**Specific Line Segment information**
3.1	**General Characteristics**
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

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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	**Specific Technical Characteristics**
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	**Energy subsystem**
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	**Control-Command and Signalling subsystem**
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	**Operation and Traffic Management subsystem**
3.5.1	Operating language

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Appendix E

Language and communication level

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

Level	Description
5	— may adapt the way he/she speaks to any interlocutor — may put forward an opinion — may negotiate — may persuade — may give advice
4	— may cope with totally unforeseen situations — may make assumptions — may express an argued opinion
3	— may cope with practical situations involving an unforeseen element — may describe — may keep a simple conversation going
2	— may cope with simple practical situations — may ask questions — may answer questions
1	— may talk using memorised sentences

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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.

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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.

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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.

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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).

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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 ([1]).

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

([1]) 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).

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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 20 - 72 021 - 7

B^{10} tu

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

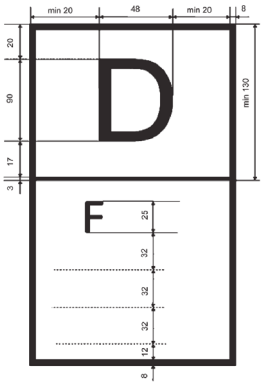
The European Vehicle Number is also written inside each cabin of the tractive rolling stock.

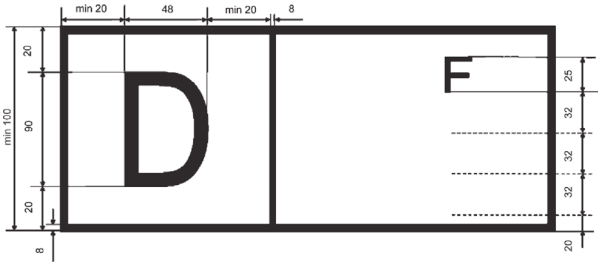
6. ALPHABETICAL MARKING OF THE INTEROPERABILITY CAPABILITY

‘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.





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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;

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— 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	An end of authority passed without permission is any occasion when a train proceeds beyond the end of authority in the following circumstances: — A trackside signal at danger, or an order to STOP where an ATP is not operational, — The end of a movement authority provided in an ATP, — A point communicated by verbal or written authorisation laid down in regulations, — Stop boards, — Hand signals. This covers movement authority as described in ETCS and authority to move covered by instructions/signalling. Any case in which a vehicle without any traction unit attached or a train that is unattended runs away is not included.
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.

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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.

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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.

([1]) 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

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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 Prawila Polzowaniia Wagonami w mejdunarodnom soobqenii = 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
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

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Abbreviation	Explanation
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