

ANNEX
COMMISSION REGULATION

[...]

~~amending Decision 2012/757/EU concerning the technical specification for interoperability relating to the ‘operation and traffic management’ subsystem of the rail system in the European Union~~

TABLE OF CONTENTS

1.	Introduction	5
1.1.	Technical scope	5
1.2.	Geographical scope.....	5
1.3.	Content of this TSI.....	5
2.	Description of subsystem/scope	6
2.1.	Subsystem.....	6
2.2.	Scope.....	6
2.2.1.	Staff and trains.....	6
2.2.2.	Principles	7 76
2.2.3.	Applicability to existing vehicles and infrastructure	7
3.	Essential requirements	7
3.1.	Compliance with the essential requirements	7
3.2.	Essential requirements - overview.....	7
4.	Characteristics of the sub-system	10
4.1.	Introduction	10
4.2.	Functional and technical specifications of the sub-system	114 1140
4.2.1.	Specifications relating to staff	114 1140
4.2.1.1.	General requirements.....	114 1140
4.2.1.2.	Documentation for drivers	11
4.2.1.2.1	Driver’s Rule Book	124 1244
4.2.1.2.2	.Description of the line and the relevant line-side equipment associated with the lines worked over	134 1342
4.2.1.2.2.1	Preparation of the Route Book.....	134 1342
4.2.1.2.2.2	Modifications to Information contained within the Route book	144 1443

4.2.1.2.2.3 Informing the driver in real time.....	1414
4.2.1.2.3 Timetables	14
4.2.1.2.4 Rolling stock.....	1514
4.2.1.3. Documentation for Railway Undertaking staff other than drivers	1514
4.2.1.4. Documentation for Infrastructure Manager’s staff authorising train movements ..	1514
4.2.1.5. Safety-related communications between train crew, other Railway Undertaking staff and staff authorising train movements	1515
4.2.2. Specifications relating to trains	1615
4.2.2.1. Train visibility	1615
4.2.2.1.1 General requirement.....	1615
4.2.2.1.2 Front end.....	1615
4.2.2.1.3 Rear end.....	16
4.2.2.2. Train audibility	1817
4.2.2.2.1 General requirement.....	1817
4.2.2.2.2 Control.....	1817
4.2.2.3. Vehicle identification.....	1817
4.2.2.4. Safety of passengers and load.....	18
4.2.2.4.1 Safety of load.....	18
4.2.2.4.2 Safety of passengers.....	1918
4.2.2.5. <u>Route compatibility and Train composition.....</u>	1918
<u>4.2.2.5.1 Route compatibility.....</u>	18
<u>4.2.2.5.2 Train composition.....</u>	18
4.2.2.6. Train braking	2019
4.2.2.6.1 Minimum requirements of the braking system.....	2019
4.2.2.6.2 Braking performance and maximum speed allowed.....	2019
4.2.2.7. Ensuring that the train is in running order	2120
4.2.2.7.1 General requirement.....	2120
4.2.2.7.2 Data required	2220
4.2.2.8. Requirements for signal and lineside marker sighting.....	2220
4.2.2.9. Driver vigilance	2221

4.2.3. Specifications relating to train operations.....	<u>2321</u>
4.2.3.1. Train planning	<u>2321</u>
4.2.3.2. Identification of trains.....	<u>2321</u>
4.2.3.2.1 Format of train running number	<u>2321</u>
4.2.3.3. Train departure	<u>2321</u>
4.2.3.3.1 Checks and tests before departure	<u>2321</u>
4.2.3.3.2 Informing the Infrastructure Manager of the train's operational status.....	<u>2321</u>
4.2.3.4. Traffic management.....	<u>2322</u>
4.2.3.4.1 General requirements	<u>2322</u>
4.2.3.4.2 Train reporting	<u>2422</u>
4.2.3.4.2.1 Data required for train position reporting.....	<u>2422</u>
4.2.3.4.2.2 Predicted hand over time	<u>2422</u>
4.2.3.4.3 Dangerous goods.....	<u>2423</u>
4.2.3.4.4 Operational quality.....	<u>2523</u>
4.2.3.5. Data recording	<u>2523</u>
4.2.3.5.1 Recording of supervision data outside the train	<u>2624</u>
4.2.3.5.2 Recording of supervision data on-board the train.....	<u>2624</u>
4.2.3.6. Degraded operation.....	<u>2625</u>
4.2.3.6.1 Advice to other users.....	<u>2625</u>
4.2.3.6.2 Advice to train drivers.....	<u>2625</u>
4.2.3.6.3 Contingency arrangements	<u>2625</u>
4.2.3.7. Managing an emergency situation.....	<u>2725</u>
4.2.3.8. Aid to train crew in the event of an incident or of a major rolling stock malfunction	<u>2826</u>
4.3. Functional and technical specifications of the interfaces.....	<u>2826</u>
4.3.1. Interfaces with the Infrastructure TSI.....	<u>2826</u>
4.3.2. Interfaces with the Control/Command and Signalling TSI.....	<u>2826</u>
4.3.3. Interfaces with the Rolling Stock TSI.....	<u>2927</u>
4.3.3.1. Interfaces with TSI LOC&PAS.....	<u>2927</u>
4.3.3.2. Interfaces with TSI WAG	<u>3028</u>

4.3.4.	Interfaces with the TSI Energy	3028
<u>4.3.5.</u>	<u>Interfaces with the TSI SRT.....</u>	<u>29</u>
<u>4.3.6.</u>	<u>Interfaces with the TSI Noise.....</u>	<u>29</u>
<u>4.3.7.</u>	<u>Interfaces with the TSI PRM.....</u>	<u>29</u>
4.4.	Operating rules	3129
4.5.	Maintenance rules	3229
4.6.	Professional competences	3229
4.6.1.	Professional competence	3229
4.6.2.	Linguistic competency	3230
4.6.2.1.	Principles	3230
4.6.2.2.	Level of knowledge	3330
4.6.3.	Initial and ongoing assessment of staff	3330
4.6.3.1.	Basic elements	3330
4.6.3.2.	Analysis and update of training needs	3331
4.6.4.	Auxiliary staff.....	3431
4.7.	Health and safety conditions	3431
4.7.1.	Introduction.....	323
4.7.2.	Medical examinations and psychological assessments	3432
4.7.2.1.	Before appointment.....	3432
4.7.2.1.1	Minimum content of the medical examination.....	3432
4.7.2.1.2	Psychological assessment.....	3532
4.7.2.2.	After appointment.....	321
4.7.2.2.1	Periodicity of periodic medical examinations	3533
4.7.2.2.2	Minimum content of the periodic medical examination	3533
4.7.2.2.3	Additional medical examinations and / or psychological assessments.....	3633
4.7.3.	Medical requirements.....	3633
4.7.3.1.	General requirements	3633
4.7.3.2.	Vision requirements	3634
4.7.3.3.	Hearing requirements	3734
4.8.	Registers of infrastructure and vehicles	3734
4.8.1.	Infrastructure	3734
4.8.2.	Rolling stock.....	3735
5.	Interoperability constituents	3735

5.1.	Definition	3735
5.2.	List of constituents	3735
6.	Assessment of conformity and/or suitability for use of the constituents and verification of the subsystem.....	3835
6.1.	Interoperability constituents	3835
6.2.	Operation and Traffic Management Subsystem	3835
6.2.1.	Principles	3835
7.	Implementation	3836
7.1.	Principles	3836
7.2.	Implementation guidelines	3936
7.3.	Specific cases.....	3937
7.3.1.	Introduction	3937
7.3.2.	List of specific cases	4037
7.3.2.1.	Temporary specific case (T1) Estonia, Latvia and Lithuania	4037
7.3.2.2.	Temporary specific case (T1) Ireland and United Kingdom.....	369
7.3.2.3.	Temporary specific case (T2) Finland.....	369
7.3.2.4.	Permanent specific case Finland.....	369
	Appendix A: ERTMS/ETCS operating rules.....	4138
	Appendix B: Common operational principles and rules	3841
	Appendix C: Safety related communications methodology	4844
	Appendix D: Elements the Infrastructure Manager has to provide to the Railway Undertaking for the Route Book and for the train compatibility over the route intended for operation..	5949
	Appendix E: Language and communication level	6853
	Appendix F: Minimum elements relevant to professional qualification for the tasks associated with “accompanying trains”.....	6954
	Appendix G: Minimum elements relevant to professional qualification for the task of preparing trains.....	5772
	Appendix H: Vehicle identification	7459
	Appendix I: List of open points	7762
	Appendix J: Glossary	7963

- Formatted: English (United States)
- Formatted: English (United States)
- Field Code Changed
- Formatted: English (United States)
- Field Code Changed
- Formatted: English (United States)
- Formatted: English (United States)
- Field Code Changed
- Formatted: English (United States)
- Formatted: English (United States)
- Field Code Changed
- Formatted: English (United States)
- Formatted: English (United States)

1. INTRODUCTION

1.1. Technical scope

This Technical Specification for Interoperability ('TSI') concerns the 'operation and traffic management' subsystem shown in the list contained in point 1 of Annex II to Directive (EU) 2016/797~~2008/57/EC~~. Further information on this subsystem is provided in Chapter 2.

Where necessary the TSI distinguishes between requirements for conventional and high-speed rail ~~as defined in Annex I, section 2.1 of Directive 2008/57/EC~~.

1.2. Geographical scope

The geographical scope of this TSI is the ~~Union's network as specified in section 1 to Annex I of Directive (EU) 2016/797 network of the whole rail system composed of:~~

~~The trans-European conventional rail system network (TEN) as described in section 1.1 "Network" to Annex I of Directive 2008/57/EC;~~

~~The trans-European high-speed rail system network (TEN) as described in section 2.1 "Network" to Annex I of Directive 2008/57/EC;~~

~~Other parts of the network of the whole rail system, following the extension of scope as described in section 4 to Annex I of Directive 2008/57/EC.~~

~~And excludes the cases referred to in Article 1(3) and 1(4) of Directive 2008/57/EC (EU) 2016/797.~~

1.3. Content of this TSI

In accordance with Article ~~45~~(3) of Directive (EU) 2016/797~~2008/57/EC~~, this TSI:

- (a) indicates its intended scope for the 'operation and traffic management' subsystem – Chapter 2;
- (b) lays down essential requirements for the subsystem concerned and its interfaces *vis-à-vis* other subsystems – Chapter 3;
- (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, ~~for example according to the categories of line, hub and/or rolling stock provided for in Annex I to Directive 2008/57/EC~~ – Chapter 4;
- (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 – Chapter 5;
- (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 – Chapter 6;
- (f) indicates the strategy for implementing the TSI. In particular, it is necessary to specify the stages to be completed and the elements that can be applied in order to make a gradual transition from the existing situation to the final situation in which compliance with the TSI ~~must~~ shall be the norm – Chapter 7;

- (g) indicates, for the staff concerned, the professional qualifications and health and safety conditions at work required for the operation and maintenance of the subsystem concerned, as well as for the implementation of the TSI – Chapter 4.
- ~~(h) indicates the provisions applicable to the existing 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 ~~45~~(5) of Directive ~~(EU)2008/57/EC~~2016/797, provision may be made for specific cases for each TSI. These are indicated in Chapter 7.

~~This TSI also comprises, in Chapter 4, the operating and maintenance rules specific to the scope indicated in points 1.1 and 1.2 of this Annex.~~

2. DESCRIPTION OF SUBSYSTEM/SCOPE

2.1. Subsystem

The 'operation and traffic management' subsystem is described in point 2.5 of Annex II to Directive ~~(EU) 2016/797~~2008/57/EC as:

“The procedures and related equipment ~~enabling-permitting a~~ coherent operation of the various structural subsystems, during both normal and degraded operation, including in particular train composition and train driving, traffic planning and management.

The professional qualifications which may be required for carrying out ~~cross-border~~any type of railway services.”

2.2. Scope

This TSI applies to the 'operation and traffic management' subsystem of infrastructure managers (hereinafter referred to as 'IM') and railway undertakings (hereinafter referred to as 'RU') related to the operation of trains ~~on the~~within the geographical scope ~~European rail system as~~ defined in chapter 1.2.

2.2.1. 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 as provided for in point 8 of Annex VI to Directive 2007/59/EC.

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 will 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 his safety authorisation, point 4.6 shall apply while mutual

recognition between Member States shall apply for point 4.7. A train will 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~~all the vehicles of the train crossing the state border cross it only to the 'frontier' location(s).~~

2.2.2. Principles

This TSI covers those elements (as set out in Chapter 4) of the rail 'operation and traffic management' subsystem, where principally there are operational interfaces between RU and IM and where there is a particular benefit to interoperability.

RU and IM ~~must~~ 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 RU's and IM's safety management system (hereinafter referred to as 'SMS') as required by Directive (EU) 2016/798~~2004/49/EC~~⁺. The SMS itself is assessed by the relevant national safety authority (hereinafter referred to as 'NSA') before ~~granting safety certificate/authorisation~~ and by the relevant NSA or the European Union Agency for Railways before granting safety certificate.

2.2.3. Applicability to existing vehicles and infrastructure

While the majority of the requirements contained in this TSI 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 TSI OPE.

Those physical elements are specified in 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 TSI shall be used to justify a national rule under a structural TSI.

~~While the majority of the requirements contained in this TSI relate to processes and procedures, a number also relate to physical elements, trains and vehicles which are important for operation.~~

~~The design criteria for these elements are described in the TSIs covering other subsystems such as rolling stock. In the context of this TSI it is their operational function that is considered.~~

3. ESSENTIAL REQUIREMENTS

3.1. Compliance with the essential requirements

In accordance with Article ~~34~~⁽¹⁾ of Directive (EU) 2016/797~~2008/57/EC~~, the Union rail system, its subsystems and their interoperability constituents ~~must~~ 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,

⁺ ~~Directive 2004/49/EC of the European Parliament and of the Council of 29 April 2004 on safety on the Community's railways and amending Council Directive 95/18/EC and Directive 2001/14/EC (Railway Safety Directive) (OJ L 164, 30.4.2004, p. 44)~~

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

~~According to Directive 2008/57/EC,~~ The essential requirements may be generally applicable to the whole European 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) 2016/797/2008/57/EC and this TSI.

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
4.2.1.2	Documentation for drivers						X											X		X		
4.2.1.2.1	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		
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		

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
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	Train composition																	X				
4.2.2.6	Train braking		X															X	X			
4.2.2.6.1	Minimum requirements of the braking system		X															X	X			
4.2.2.6.2	Braking performance		X															X	X			
4.2.2.7	Ensuring that the train is in running order		X															X	X			
4.2.2.7.1	General requirement																	X	X			
4.2.2.7.2	Data required																	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 Infrastructure Manager of the train's operational status		X			X													X	X		
4.2.3.4	Traffic management																	X	X	X		
4.2.3.4.1	General requirements																	X	X	X		
4.2.3.4.2	Train reporting																	X	X	X		

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
4.2.3.4.2.1	Data required for train position reporting																	X			X		
4.2.3.4.2.2	Predicted hand over time																	X			X		
4.2.3.4.3	Dangerous goods																	X	X				
4.2.3.4.4	Operational quality																		X	X			
4.2.3.5	Data recording						X												X				
4.2.3.5.1	Recording of supervision data outside the train						X												X				
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. CHARACTERISTICS OF THE SUBSYSTEM

4.1. Introduction

Taking into account all the relevant essential requirements, the 'operation and traffic management' subsystem, as described in point 2.2, covers only the elements specified in this Chapter.

In accordance with Directive 2012/34/EU², it is the overall responsibility of the infrastructure manager to provide all the appropriate requirements which **mustshall** be met by trains permitted to run on his 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 2.2.1., this TSI 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 **mustshall** supply the driver with all the necessary information and documentation required to carry out his duties. Its form may either be a document or computer based.

This information **mustshall** 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 (recast) (OJ L 343, 14.12.2012, p.32)~~

4.2.1.2.1 Driver's Rule Book

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

The Driver's Rule Book mustshall 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 mustshall 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 mustshall 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 is responsible for compiling the Driver's Rule Book.~~

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

The railway undertaking ~~must shall be responsible for compile~~ the Driver's Rule Book and compile it in such a way that it is complete, 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 mustshall have two appendices:

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

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

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

- the infrastructure manager (or the organisation responsible for the preparation of the operating rules) mustshall provide the railway undertaking with the appropriate information in the infrastructure manager's operating language,
- the railway undertaking mustshall draw up the initial or updated document;
- if the language chosen by the railway undertaking for the Driver's Rule Book is not the language in which the appropriate information was

originally supplied, it is the responsibility of the railway undertaking to arrange for any necessary translation and/or provide explanatory notes in another language.

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

~~The railway undertaking must ensure that the content of the Driver's Rule Book 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 mustshall be provided with a description of the lines and the associated line-side equipment for the lines over which they will operate and relevant to the driving task. Such information mustshall be set out in a single document called the "Route Book" ~~(which can either be a traditional document or computer based).~~

The following is a list of information which mustshall, 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 mustshall 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 infrastructure manager mustshall provide the railway undertaking with at least the information for the route book as defined in Appendix D2. The infrastructure manager shall ensure that the content of the documentation provided to the railway undertaking(s) is complete and accurate.

As a minimum, the following information mustshall be included (this list is not exhaustive):

- (a) the general operating characteristics:
 - (a) type of signalling system and corresponding operational regime (double track, reversible working, left or right hand running, etc.),
 - (b) type of power supply,
 - (c) type of track to train radio equipment.
- (b) indication of rising and falling gradients with their gradient values and location;

(c) detailed line diagram:

- names of stations on the line and key locations and their location;
- tunnels, including 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 can take place;
- essential locations such as neutral sections;
- permissible speed limits for each track, including, if necessary, differential speeds relating to certain types of train;
- the responsible infrastructure manager;
- means of communication with the traffic management / control centre in normal and degraded mode.

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

~~The railway undertaking must ensure that the content of the Route Book is complete and accurate.~~

4.2.1.2.2.2 Modifications to information contained within the Route Book

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

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

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

~~The railway undertaking must ensure that the content of the document grouping the modifications to information contained within the Route book is complete and accurate.~~

4.2.1.2.2.3 Informing the driver in real time

The infrastructure manager **mustshall** 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 **mustshall** 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 **mustshall** be based on information supplied by the infrastructure manager, may be provided either electronically or in a paper format.

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

4.2.1.2.4 Rolling stock

The railway undertaking **mustshall** provide the driver with all information relevant to the working of the rolling stock during degraded situations (such as trains requiring assistance). Such documentation **mustshall** 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 **mustshall** provide all members of his 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 **mustshall** 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 **mustshall** be set out in:

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

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

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

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

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

In accordance with Directive 2012/34/EU, the infrastructure manager is responsible for publishing the "operating" language(s) used by his 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

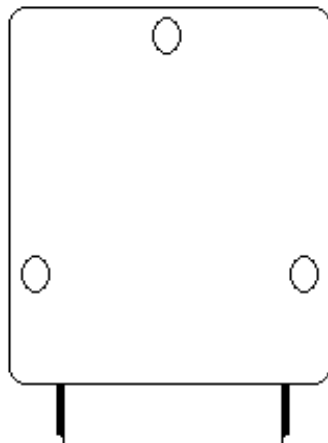
4.2.2.1.1 General requirement

The railway undertaking **mustshall** 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 **mustshall** 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 **mustshall** be fitted with three lights in an isosceles triangle, as shown below. These lights **mustshall** always be lit when the train is being driven from that end.

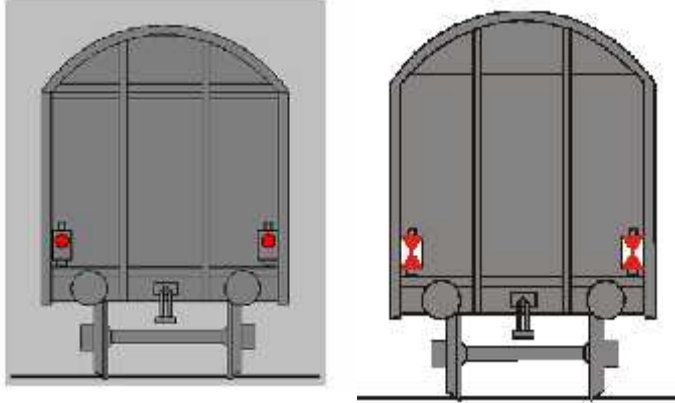


The front-end lights **mustshall** optimise train detectability (marker lights), provide sufficient visibility for the train driver (head lights) by night and during low light conditions and **mustshall** not dazzle the drivers of oncoming trains.

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 *[add reference of LOC&PAS TSI that is entering into force in 1 Jan 2015]* ('LOC&PAS TSI').

4.2.2.1.3 Rear end

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



4.2.2.1.3.1 Passenger trains

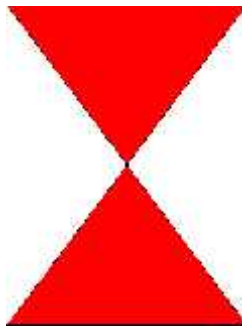
The rear end indication of a passenger train mustshall consist of 2 steady red lights at the same height above buffer on the transversal axis.

4.2.2.1.3.2 Freight trains in international traffic

The Member State mustshall notify the Commission which of the following rules will apply on the network of its Member State for trains that cross a border between Member States:

Either

- 2 steady red lights, or
- 2 reflective plates of the following shape with white side triangles and red top and bottom triangle:



The lamps or plates mustshall be on the same height above buffer on the transversal axis.

Member States that require 2 reflective plates mustshall also accept 2 steady red lights as train rear end indication.

Member States that require 2 steady red lights mustshall also accept 2 reflective plates as train rear end indication if the following 2 conditions are fulfilled in the whole network:

- the operational rule for entering a possible occupied block section states that the train drivers shall be able to stop in front of any obstacle

And

- There is no requirement that signallers mustshall visually check the presence of a train rear end device to verify that the train is complete.

In case a Member State requires 2 steady red lights and does not accept 2 reflective plates on its entire network, the Member State may accept the use of reflective plates in one or more section of lines of the network. The concerned Member State specifies in its notification the generic conditions of acceptance of reflective plates.

To ensure that all railway undertakings are given efficient information about the implementation of these conditions, the infrastructure manager shall publish the sections of lines concerned and the related conditions. The specific conditions defined by the infrastructure manager shall include an assessment of the risks and operational requirements.

4.2.2.1.3.3 Freight trains not crossing a border between Member States

The Member State mustshall notify the Commission which rules will apply on its network for trains not crossing a border.

In addition, the notified rules for freight trains in international traffic described in 4.2.2.1.3.2 shall also be accepted for trains not crossing a border.

4.2.2.2. Train audibility

4.2.2.2.1 General requirement

The railway undertaking mustshall 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 mustshall be possible from all driving positions.

4.2.2.3. Vehicle identification

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

It mustshall 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 mustshall 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 ~~must~~shall ensure that passenger transport is undertaken safely at the departure and during the journey.

~~4.2.2.5. Train composition~~Route compatibility and train composition

~~4.2.2.5.1~~ Route compatibility

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

~~The parameters that shall be used in the process of the RU in order to ensure that each vehicle of a train is compatible with the route the train is planned to operate on are set out in Appendix D1.~~

~~The infrastructure manager shall update the railway undertaking of the changes on characteristics of the route. If necessary, the route compatibility check shall be updated.~~

~~Elements not directly related to technical route compatibility shall be checked when relevant:~~

- ~~- transport of dangerous good as referered into point 4.2.3.4.3.~~
- ~~- quieter route as refered into TSI Noise.~~
- ~~- exceptional transport as referred into appendix I.~~

~~The railway undertaking must define the rules and procedures to be followed by his staff so as to ensure that the train is in compliance with the allocated path.~~

~~4.2.2.5.2~~ Train composition

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

- (a) the vehicles
 - all vehicles in the train ~~including their loads must~~shall be ~~in compliance~~compatible with all the requirements applicable on the routes over which the train will run;
 - all vehicles on the train ~~including their loads must~~shall be fit to run at the maximum speed at which the train is scheduled to run;
- (b) all vehicles on the train ~~must shall be currently~~remain within their specified maintenance interval ~~and will remain so~~for the duration (in terms of both time and distance) of the journey being undertaken;
- (c) the train
 - the ~~combination~~composition of vehicles ~~including their loads~~ forming a train ~~must~~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 the train is technically fit for the journey to be undertaken and remains so throughout the journey.
- ~~(e) the weight, axle load and axle distribution must be compatible with the load carrying capacity of the infrastructure.~~

- ~~(f) the weight of the train must be within the maximum permissible for the section of route, the strength of the couplings, the traction power and other relevant characteristics of the train.~~
- ~~(g) the maximum speed of the train

 - ~~— the maximum speed at which the train can run must take into account any restrictions on the route(s) concerned, braking performance, axle load and vehicle type.~~~~
- ~~(h) the clearance gauge;~~
- ~~(i) Reference profiles for which each vehicle was authorised in the train (inclusive of any load) must be within the maximum permissible for the section of route.~~
- ~~(j) Train detection system(s)~~
- ~~(k) Energy related elements:

 - ~~– maximum train current;~~
 - ~~– maximum current at standstill per pantograph;~~
 - ~~– mean contact force;~~
 - ~~– arrangement of pantographs;~~
 - ~~– running through phase and system separation sections.~~~~

~~The RU may need to consider a~~Additional constraints ~~may be required or imposed~~ due to the type of braking regime or traction type on a particular train (see point 4.2.2.6).

~~The infrastructure manager must inform the railway undertaking of the changes on characteristics of the allocated path change, as soon as these changes occur. The elements that must be checked in order to ensure the train's compliance with the allocated path are set out in Appendix D.~~

~~4.2.2.5.~~4.2.2.6. Train braking

4.2.2.6.1 Minimum requirements of the braking system

All vehicles in a train **mustshall** be connected to the continuous automatic braking system as defined in the Loc&Pas and WAGRST TSIs.

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

In the case of a train becoming accidentally divided into two parts, both sets of detached vehicles **mustshall** 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:

- 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.

(2) Additionally, 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 RUs who intend to operate trains on its network. The braking tables already in use and accepted for the existing lines at the date of entry into force of the present regulation shall also be made available.

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

- the relevant line characteristics as expressed in point (1) above ~~and/or~~, if available, the information provided by the infrastructure manager in accordance to point (2) above. If the infrastructure manager has provided the information of point (2), the railway undertaking has to express the braking capability by using the same information; 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 ~~must~~shall immediately inform the infrastructure manager. The infrastructure manager may take appropriate measures to reduce the impact on the overall traffic on its network.

4.2.2.6-4.2.2.7. Ensuring that the train is in running order

4.2.2.7.1 General requirement

The railway undertaking ~~must~~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 ~~must~~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 **mustshall** define and keep up to date conditions and procedures for train running in degraded mode.

4.2.2.7.2 Data required

~~The railway undertaking shall ensure that the following data required for safe and efficient operation are made available to the infrastructure manager(s) prior to the departure of the train. The data required for safe and efficient operation and the process by which this data must be forwarded must comprise:~~

- 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 must ensure that this data is made available to the infrastructure manager(s) prior to the departure of the train.~~

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

4.2.2.7.4.2.2.8. Requirements for signal and lineside marker sighting

The driver **mustshall** be able to observe signals and lineside markers, and they **mustshall** 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 **mustshall** be designed and positioned in such a consistent way to facilitate this. Issues that **mustshall** be taken into account include:

- that they are suitably sited so that train headlights 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 headlights easily allow the driver to read the information.

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

4.2.2.8.4.2.2.9. Driver vigilance

A means of onboard 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 **mustshall** advise what data is required when a train path is requested.

4.2.3.2. Identification of trains

Each train **mustshall** be identified by a train running number. The train running number is given by the infrastructure manager when allocating a train path and **mustshall** be known by the railway undertaking and all infrastructure managers operating the train. The train running number **mustshall** 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 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](#)~~Decision-2012/88/EU as amended~~)

4.2.3.3. Train departure

4.2.3.3.1 Checks and tests before departure

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

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

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

The railway undertaking **mustshall** 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 **mustshall** ensure the safe, efficient and punctual operation of the railway, including effective recovery from service disruption.

The infrastructure manager **mustshall** 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) can 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

The infrastructure manager **mustshall**:

- (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) provide the specific data required in relation to train position reporting. Such information **mustshall** include:
 - Train identification
 - Identity of reporting point
 - Line on which the train is running
 - Scheduled time at reporting point
 - Actual time at reporting point (and whether depart, arrive or pass - separate arrival and departure times **mustshall** be provided in respect of intermediate reporting points at which the train calls)
 - Number of minutes early or late at the reporting point
 - Initial explanation of any single delay exceeding 10 minutes or as otherwise required by the performance monitoring regime
 - Indication that a report for a train is overdue and the number of minutes by which it is overdue
 - Former train identification(s), if any
 - Train cancelled for a whole or a part of its journey.

4.2.3.4.2.2 Predicted hand over time

The infrastructure manager **mustshall** 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 **mustshall** include information on service disruption (description and location of problem).

4.2.3.4.3 Dangerous goods

The railway undertaking **mustshall** define the procedures to supervise the transport of dangerous goods.

These procedures **mustshall** include:

- the provisions as specified in Directive 2008/68/EC of the European Parliament and of the Council ³
- advice to the driver of the presence and position of dangerous goods on the train

³ ~~Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area (recast) (OJ L 343, 14.12.2012, p.32)~~

- 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 **mustshall** have processes in place to monitor the efficient operation of all the services concerned.

Monitoring processes **mustshall** be designed to analyse data and detect underlying trends, both in terms of human error and system error. The results of this analysis **mustshall** 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 **mustshall**, subject to commercial confidentiality, be communicated accordingly.

Events that have significantly disrupted operations **mustshall** 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 **mustshall** 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 **mustshall** 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 **mustshall** 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 **mustshall** 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-~~of this TSI~~.

The data [mustshall](#) be securely sealed and stored and accessible to authorised bodies including ~~National Investigation~~[Investigating](#) Bodies in carrying out their role pursuant to Article ~~2249~~ of Directive [\(EU\) 2016/7982004/49/EC](#).

4.2.3.5.1 Recording of supervision data outside the train

As a minimum, the infrastructure manager [mustshall](#) 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 [mustshall](#) record the following data:

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

Further technical specifications concerning the recording device are set out in the TSI Loc & Pas.

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) [mustshall](#) 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 [mustshall](#) 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 his infrastructure, and neighbouring infrastructure managers as

appropriate, **mustshall** 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 **mustshall** be proportional to the nature and potential severity of the degradation.

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

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

The infrastructure manager **mustshall** 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 **mustshall** include contact details both during and outside office hours.

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

The infrastructure manager **mustshall** advise all the railway undertaking(s) of any changes to his details.

4.2.3.7. Managing an emergency situation

The infrastructure manager **mustshall**, in consultation with:

- all railway undertakings operating over his infrastructure, or, where appropriate, representative bodies of railway undertakings operating over his 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 **mustshall** 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 **mustshall** have processes to inform passengers about onboard 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 **mustshall** 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 TSI**, the functional and technical specifications of the interfaces are as follows:

4.3.1. *Interfaces with the infrastructure TSI*

Reference operation TSI		Reference infrastructure 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 in the route book Degraded operation	4.2.1.2.2.2 4.2.3.6	Operating rules	4.4

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

Reference operation TSI		Reference control-command and signalling TSI	
Parameter	Point	Parameter	Point
Rule book Operating rules	4.2.1.2.1 4.4	Operating rules	4.4
Requirements for lineside signal and marker sighting	4.2.2.8	Visibility of track-side control-command objects	4.2.15
Train braking	4.2.2.6	Train braking performance and characteristics	4.3.2.3
Rule Book	4.2.1.2.1	Use of sanding equipment	4.2.10
Train running number	4.2.3.2.1	ETCS DMI	4.2.12
		GSM-R DMI	4.2.13

Reference operation TSI		Reference control-command and signalling TSI	
Data recording onboard	4.2.3.5	Interface to data recording for regulatory purposes	4.2.14
<u>Ensuring that the train is in running order</u>	<u>4.2.2.7</u>	<u>Key management</u>	<u>4.2.8</u>

4.3.3. Interfaces with the rolling stock TSIs

4.3.3.1. Interfaces with TSI on locomotives and passenger rolling stock

Reference operation—OPE TSI		Reference LOC&PAS TSI	
Parameter	Point	Parameter	Point
Contingency arrangements	4.2.3.6.3	Rescue coupling End coupling	4.2.2.2.4 4.2.2.2.3
Train composition	4.2.2.5	axle load parameter	4.2.3.2
Train braking	4.2.2.6	Braking performance	4.2.4.5
Train visibility	4.2.2.1	External front and rear lights	4.2.7.1
Train audibility	4.2.2.2	Horn	4.2.7.2
Requirements for lineside signal and marker sighting	4.2.2.8	External visibility Optical characteristics of the windscreen Internal lighting	4.2.9.1.3 4.2.9.2.2 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 Rescue related descriptions	4.2.12.5 4.2.12.6
Train composition Minimum elements relevant to professional qualification for the tasks associated with 'accompanying trains'	4.2.2.5 Appendix F	Operating documentation	4.2.12.4
Sanding	Appendix B	Isolating emissions	4.2.3.3.1.1

4.3.3.2. Interfaces with TSI on freight wagons

Reference operation-OPE TSI		Reference wagonWAG freight TSI	
Parameter	Point	Parameter	Point
Rear end	4.2.2.1.3.2	Attachment devices for rear-end signal Rear-end signal	4.2.6.3 Appendix E
Train composition	4.2.2.5	Gauging	4.2.3.1
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

4.3.4. Interfaces with the Energy TSI

Reference operation-OPE TSI		Reference energy-ENE TSI	
Parameter	Point	Parameter	Point
Train composition Preparation of the Route Book	4.2.2.5 4.2.1.2.2.1	Maximum train current	4.2.4.1
Train composition Preparation of the Route Book	4.2.2.5 4.2.1.2.2.1	Separation sections: Phase System	4.2.15 4.2.16

4.3.5. Interfaces with TSI on Safety in Railway Tunnels

Reference operation-OPE TSI		Reference SRT TSI	
Parameter	Point	Parameter	Point

Reference operation-OPE TSI		Reference SRT TSI	
Ensuring that the train is in running order Train departure Degraded operation	4.2.2.7 4.2.3.3 4.2.3.6	Emergency rule	4.4.1
Managing an emergency situation	4.2.3.7	Tunnels emergency plan Exercises Provision of on-train safety and emergency information to passengers	4.4.2 4.4.3 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 TSI Noise

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

4.3.7. Interfaces with TSI Person with Reduced Mobility

Reference OPE TSI		Reference PRM TSI	
Parameter	Point	Parameter	Point
<u>Professional Competence</u> <u>Minimum elements relevant to professional qualification for the tasks associated with “accompanying trains”</u>	<u>4.6.1</u> <u>Appendix F</u>	<u>Infrastructure subsystem</u>	<u>4.4.1</u>

Reference OPE TSI		Reference PRM TSI	
<u>Professional Competence</u> <u>Minimum elements relevant to professional qualification for the tasks associated with “accompanying trains”</u>	4.6.1 <u>Appendix F</u>	<u>Rolling stock subsystem</u>	<u>4.4.2</u>
<u>Train composition</u>	<u>4.2.2.5</u>	<u>Rolling stock subsystem</u>	<u>4.4.2</u>

4.4. Operating rules

The rules and procedures enabling coherent operation of new and different structural subsystems intended to be used in the European Union rail system, and in particular those that are linked directly to the operation of a new control and signalling system, ~~must~~shall be identical where identical situations exist.

The operational principles and rules specific to the European Rail Traffic Management System (ERTMS/ETCS) and for ERTMS/GSM-R) ~~radio system~~ are specified in Appendix A.

Operational principles and rules, which are common across the European Union rail system, are specified in Appendices A and B.

Operational principles and rules, which are not common across the European Union rail system and therefore may be subject to national rules, are listed in Appendix I.

4.5. Maintenance rules

Not applicable

4.6. Professional competences

4.6.1. Professional competence

Staff of the railway undertaking and the infrastructure manager ~~must~~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 can 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 mustshall 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, mustshall 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 mustshall be sufficient for safety purposes.

- (a) As a minimum this mustshall comprise of the driver being able to:
- send and understand all the messages specified in Appendix C;
 - effectively communicate in routine, 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, mustshall 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 mustshall be at least level 2 as described in Appendix E.

4.6.3. *Initial and ongoing assessment of staff*

4.6.3.1. Basic elements

Railway undertakings and infrastructure managers are required to define the assessment process for their staff in order to meet the requirements specified in [Commission Delegated Regulation \(EU\) 2018/762](#) or Commission Regulations (EU) 1158/2010⁴ and (EU) 1169/2010⁵.

4.6.3.2. Analysis and update of training needs

Railway undertakings and infrastructure managers mustshall 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 [Commission Delegated Regulation \(EU\) 2018/762](#) or Regulations (EU) 1158/2010 and (EU) 1169/2010.

This analysis mustshall 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 mustshall define the process by which knowledge of on board staff of the routes worked over is acquired and maintained. This process mustshall be:

- based upon the route information provided by the infrastructure manager; and

European Parliament and of the Council of 21 November 2012 establishing a single European railway area (recast) (OJ L 343, 14.12.2012, p.32)

~~taining railway safety certificates (OJ L 326, 10.12.2010, p. 11).~~

~~⁵ Commission Delegated Regulation (EU) 2018/762 of 8 March 2018 establishing common safety methods on safety management system requirements
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 authorisation (OJ L 327, 11.12.2010, p. 13).~~

- 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 can be found in respectively the appendices F and G. As appropriate, these elements **mustshall** 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 will not be appropriate. The analysis of training needs **mustshall** document those not deemed appropriate and the reasons why.

4.6.4. *Auxiliary staff*

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

4.7. **Health and safety conditions**

4.7.1. *Introduction*

Staff specified in point 4.2.1 as staff performing safety-critical tasks in accordance with point 2.2 **mustshall** have appropriate fitness to ensure that overall operational and safety standards are met.

Railway undertakings and infrastructure managers **mustshall** 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 **mustshall** be conducted by a medical doctor.

Staff **mustshall** 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 **mustshall** 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 **mustshall** 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 **mustshall** be taken into account:

- (a) Cognitive:
 - Attention and concentration,
 - Memory,
 - Perceptive capability,
 - Reasoning,
 - Communication.
- (b) Psychomotor:
 - Speed of reaction,
 - Gestured co-ordination.
- (c) Behavioural and personality
 - Emotional self control,
 - Behavioural reliability,
 - Autonomy,
 - Conscientiousness.

If any of those elements is omitted, the respective decision **mustshall** 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 **mustshall** 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 **mustshall** 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 **mustshall** 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 **mustshall** 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 **mustshall** put systems in place to ensure that such additional examinations and assessments are undertaken as appropriate.

4.7.3. Medical requirements

4.7.3.1. General requirements

Staff **mustshall** 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 co-ordination;
- Significant limitation of mobility.

The following vision and hearing requirements **mustshall** 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, keratomies 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. ~~Registers of~~**Additional information on infrastructure and vehicles**

~~Due to the characteristics of the registers of infrastructure and vehicles, as defined in Articles 33, 34 and 35 of Directive 2008/57/EC, these registers are not suitable for the particular requirements of the operation and traffic management subsystem. Therefore this TSI specifies nothing in respect of these registers.~~

~~However, there is an operational requirement for certain infrastructure related data items to be made available to a railway undertaking and conversely for certain rolling stock related items to be made available to an infrastructure manager, as specified in point 4.8.1 and point 4.8.2. In both cases the data concerned must be complete and accurate.~~

4.8.1. Infrastructure

The requirements for the rail infrastructure related data items with regard to the operation and traffic management subsystem, and which **mustshall** be made available to railway undertakings, are specified in Appendix D. The infrastructure manager is responsible for the correctness of the data.

4.8.2. Rolling stock

The following rolling stock related data items **mustshall** be available to infrastructure managers. The keeper is responsible for the correctness of the data:

- whether the vehicle is constructed from materials which can be hazardous in case of accidents or fire (for example, asbestos);
- total length of the vehicle, including buffers if existing.

5. INTEROPERABILITY CONSTITUENTS

5.1. Definition

As defined in Article 2.7(~~f~~) of Directive (EU) 2016/7972008/57/EC, 'interoperability constituents' means "any elementary component, group of components, subassembly or complete assembly of equipment incorporated or intended to be incorporated into a subsystem, upon which the interoperability of the rail system depends directly or indirectly, ~~including~~. ~~The concept of a 'constituent' covers~~ both tangible objects and intangible objects ~~such as software~~".

5.2. List of constituents

In respect to the operation and traffic management subsystem, there ~~are~~**is** no interoperability constituents.

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

6.1. Interoperability constituents

As this TSI 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~~2008/57/EC.

In accordance with Articles ~~9~~10 and ~~10~~11 of Directive ~~(EU) 2016/798~~2004/49/EC, railway undertakings and infrastructure managers ~~must~~shall demonstrate compliance with the requirements of this TSI within their safety management system when applying for any new or amended safety certificate or safety authorisation.

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

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

7. IMPLEMENTATION

7.1. Principles

Railway Undertakings and Infrastructure Managers shall implement the requirements laid down in Section 4.2.2.5.1 and appendix D1 by the date of entry into force of the transposition laws of Directive (EU) 2016/797 or on 16 June 2020 at the latest.

They shall comply with Appendices B.15, B.16, B.17 and C to this Regulation within 5 years of its entry into force at the latest.

They shall shall comply with all other parts of this Regulation than those mentioned in the previous paragraphs within 2 years after the date of its entry into force as part of updating the SMS or as part of renewing the safety certificate/authorization.

~~Implementation of this TSI and conformity with the relevant points of this TSI must be determined in accordance with an implementation plan that must be drawn up by each Member State for the lines for which they are responsible.~~

~~This plan must take into account:~~

- ~~(a) — the specific human factors issues associated with operating any given line;~~
- ~~(b) — the individual operating and safety elements of each line involved; and~~
- ~~(c) — whether implementation of the element(s) under consideration is to be:
— for all trains on the line, or not,
— only for certain lines;~~

- applicable on all lines,
- applicable to all trains running on the network.
- (d) the relationship with implementation of the other subsystems (control-command and signalling, rolling stock, etc.).

At this time any specific exceptions that may be applicable should be taken into account and documented as part of the plan.

The implementation plan must take into account the various levels of potential for implementation from any of the following events, namely when:

- (a) a railway undertaking or infrastructure manager commences operations,
- (b) a renewal or upgrade to the existing operational systems of a railway undertaking or infrastructure manager is introduced,
- (c) new or upgraded infrastructure, energy, rolling stock or command control & signalling subsystems, requiring a corresponding set of operating procedures, are put into service.

It is commonly understood that the full implementation of all elements of this TSI cannot be complete until the hardware (infrastructure, control and command, etc.) that is to be operated has been harmonised. The guidelines set out in this Chapter must therefore only be seen as an interim phase supporting migration to the target system.

7.2. Implementation guidelines

There are three distinct elements to implementation:

- (a) Confirmation that any existing systems and processes comply with the requirements of this TSI
- (b) Adaptation of any existing systems and processes to comply with the requirements of this TSI
- (c) New systems and processes arising from implementation of other subsystems
 - New/upgraded conventional lines (infrastructure/energy)
 - New or upgraded ETCS signalling installations, GSM-R radio installations, Hot Axle Box Detectors, ... (control-command and signalling)
 - New rolling stock (rolling stock)

7.3.7.2. Specific cases

7.3.7.2.1. 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 either by 2030 (case "T1") or, by 2024 (case "T2") or by 2018 (case "T3").

7.3.2.7.2.2. *List of specific cases*

7.3.2.1.7.2.2.1. Temporary specific case (T1) Estonia, Latvia and Lithuania

For the implementation of point 4.2.2.1.3.2 and 4.2.2.1.3.3, trains which are operated solely on the 1520 mm gauge network of Estonia, Latvia and Lithuania may use another specified train rear end signal.

7.3.2.2.7.2.2.2. Temporary specific case (T2) 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.

7.3.2.3. Temporary specific case (T3) Finland

~~For the implementation of the common operational rule 5 of Appendix B, Finland may use another rule to mitigate the effect of a complete failure of train rear end signal of passenger trains.~~

7.3.2.4.7.2.2.3. Permanent specific case (P1) Finland

For the implementation of point 4.2.2.1.3.3 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.

Appendix A

ERTMS/ETCS operating-operational rules

The operating-operational rules for ERTMS/ETCS and ERTMS/GSM-R are specified in the Technical Document "~~ETCS and GSM-R rules and principles~~ERTMS operational principles and rules – version 4~~5~~" published on the ERA website (www.era.europa.eu).

Appendix B

Common operational principles and rules

B1. Fundamental operational principles

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

B2. Common operational rules

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

1. SANDING

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

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

The exceptions to this are:

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

2. DEPARTURE OF THE TRAIN

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

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

3. NO AUTHORISATION FOR TRAIN MOVEMENT AT THE EXPECTED TIME

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

4. COMPLETE FAILURE OF FRONT END LIGHTS

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

4.1. During good visibility

The driver shall inform the signaller about the failure. The train shall proceed at the maximum permitted speed to the nearest location where the front end light can 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 can 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 can be cleared.

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

5. COMPLETE FAILURE OF A REAR END SIGNAL

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

6. FAILURE OF THE AUDIBLE WARNING DEVICE OF A TRAIN

If the audible warning device fails, the driver shall inform the signaller about the failure. The train shall not exceed the permitted speed for the failure of an audible warning device to the nearest location where the audible warning device can be repaired or the affected vehicle replaced. The driver shall be able to stop before passing over any level crossing where the audible warning device ~~must~~shall 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 ~~must~~shall be prevented.

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

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

8. FAILURE OF VOICE RADIO COMMUNICATION

8.1. Failure of train radio detected during train preparation

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

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

All failure types

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

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

On-board Failure

A train with a failed voice radio communication may:

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

~~8.2. Failure of train radio when the train has entered service~~

~~When the driver becomes aware that the voice radio is failed, the driver shall inform the signaller as soon as practicable. The driver shall then carry out the formal instructions given by the signaller concerning the further movement of the train. A train with a failed train radio may continue the service:~~

~~— as long as another means of emergency communication is provided between the driver and the signaller; or,~~

~~— to the nearest location where the radio can be repaired or the affected vehicle replaced as long as another means of communication is 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, taking into account the line visible in advance, such that it is possible to stop short of any vehicle, stop aspect or obstacle; 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 mustshall immediately inform the signaller about the failure and the circumstances of the failure.
- (2) When an assisting train is needed, the driver and signaller mustshall 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 mustshall not be moved even if the defect is rectified until:

- the assisting train has arrived, or
 - the driver and signaller have agreed alternative arrangements.
- (3) The signaller mustshall not allow the assisting train to enter the section occupied by the failed train unless confirmation has been received that the failed train will 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 mustshall 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 mustshall 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 mustshall have authorisation to pass a signal showing stop aspect/indication.

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

The driver mustshall apply the instructions and mustshall not exceed any speed restriction, where one is imposed, until reaching the location where the normal operation can 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 mustshall report to the signaller the abnormal signalling aspect-when observed.

13. EMERGENCY CALL

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

In addition, the driver shall:

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

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

14. IMMEDIATE ACTIONS TO PREVENT DANGER TO TRAINS

- (1) Any RU/IM staff who become aware of a danger to trains mustshall 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 mustshall stop and alert the signaller immediately to the danger.

15. FAILURE OF ON-BOARD EQUIPMENT

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

The RU 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 an ATP/TPS, the driver shall take action to support the emergency brake.
- The driver shall inform the signaller.

- If the signaller becomes aware that a train has passed an end of authority without permission, then the signaller shall take any necessary action to stop the train immediately.
- The driver and signaller shall take any necessary action to protect all movements.

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

17. FAILURE OF TRACKSIDE EQUIPMENT INCLUDING CATENARY

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

Appendix C

Safety related communications methodology

C1. Oral communication

1. Scope and Purpose

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

2. Safety related communications

2.1 Communication structure

The transmission of safety-related messages shall be short and clear and, as far as possible, without abbreviation. In order to ensure a message is understood and the necessary action can 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 can be omitted.
- if necessary, correct a mistake that has been made in the message.
- if necessary, let the person know how they can be contacted.

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

2.3 Communication content

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

- by the signaller:

<u>Train [running number]</u>
<u>this is[control area/location of the signal box]</u>

- by the driver:

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

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

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

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

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

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

3 Communication rules

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

3.1 International Phonetic Alphabet

The International Phonetic Alphabet shall be used:

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

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

3.2 Numbers

The Numbers shall be spoken digit by digit:

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

~~1. SCOPE AND PURPOSE~~

~~1.1 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 and methodology. Safety-related communication has priority over all other communication.~~

~~2. COMMUNICATIONS STRUCTURE~~

~~2.1 The voice transmission of safety-related messages shall be short and clear without abbreviation. In particular it shall cover the following points to ensure it is understood and the necessary action can be undertaken, whoever is giving the message shall:~~

- ~~— give their exact location.~~

- state the task they are carrying out and information on the action that is needed.
- make sure the message is received and repeated back as required.
- if necessary, correct a mistake that has been made in the message.
- if necessary, let the person know how they can be contacted.

2.2 Emergency messages are intended to give urgent operational instructions that are directly linked with the safety of the railway. For such messages the repetition of the message can be omitted.

3. COMMUNICATION METHODOLOGY

3.1 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.

3.2 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.

3.3 The following messages shall be used for this purpose 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)

4. COMMUNICATION RULES

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

4.2 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;
- in case of interference on the radio or phone;
- 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 — Osear	T — Tango	Y — Yankee
E — Echo	K — Kilo	P — Papa	U — Uniform	Z — Zulu
F — Foxtrot				

4.3 — 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

5. — TERMS (GENERAL)

Standard terminology to be used in the communication procedure

5.1 — Speech transmission procedure

5.1.1 — Term transferring the opportunity to speak to the opposite party:

over

5.2 — Message receiving procedure

5.2.1 — upon receiving a direct message

Term confirming that the sent message has been received:

received

5.2.2 — Term used to have the message repeated in the event of poor reception or misunderstanding

say again (+ speak slowly)

5.2.3 — upon receipt of a message that has been read-back

Terms used to ascertain whether a read-back message exactly matches the sent message:

correct

5.2.4 — or not:

error (+ I say again)

5.3— Communications breaking procedure

5.3.1 if the message has ended:

out

5.3.2— if break is temporary and the connection is not broken

Term used to keep the other party waiting:

wait

5.3.3— Term used to tell the other party that the communication might be broken but should be resumed later on:

I call again

C2. Operational instructions

1. Introduction

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

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

10-20. RESERVED

The numbers 1 to 20 are reserved for European instructions, numbers 1-5 and 7 are mandatory for ETCS. If an operational instruction related to class B system requires more information than the European instructions, the national instruction can 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 can only be revoked by a European instruction n°4 explicitly referring to the unique identification of the instruction to be revoked.

3. Delivery of the operational instruction

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

When an operational instruction is required to be written down by the train driver, the train shall be at a standstill.

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 his train / shunting movement and its current or identified location.

4. Awareness of the operational instruction

The RU 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 common safety methods on conformity assessment and common safety methods on safety management system, the IM and RU 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 IM, there is no obligation to display this field in the European instruction and no field shall be added.

A Train No

B Date

C Location of issuer

D Location of Train

E Unique identification

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

1.10 Km/Serial/Exp.

1.11 Km/Signal/Exp/To

1.12 Km/Serial/Exp

Run with a maximum speed of

x.00

train

to

x.01 Km/h/Exp.

x.02 Location Km/Serial

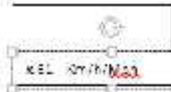
x.03 Location Km/h/Exp.

Is exempted from running on sight

x.40

Set SR speed to

x.00



Set SR distance to

x.00 m

Additional instructions

x.01 Km/Exp.

M ID of Driver

N ID of Issuer

O Time

A Train/Shunting movement No **B** Date **C** Location of issuer

D Location of Train/Shunting movement **E** Unique Identification

European Instruction 2 – Permission to proceed after a TRIP

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

Run with a maximum speed of from to

Is exempted from running on sight

Examine the line for the following reason:

Report findings to:

Set SH speed to Set SH distance to

Additional instruction:

M ID of Driver **N** ID of issuer **O** Time

A Train No.

B Date

C Location of issuer

D Location of Train

E Unique identification

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

Remain at Standstill at the current position

Carry out End of Mission (EoM)

Additional instruction

4.41 1100.05

M ID of Driver

N ID of Issuer

O Time

A Train No

B Date

C Location of issuer

D Location of Train

E Unique identification



European Instruction 4 – Revocation of an instruction



Operational instruction

4.10

with unique identification

8.4.11 unique identification

is revoked



Additional instructions

4.90

4.91.1.100

M ID of Driver

N ID of Issuer

O Time

A Train No.

B Date

C Location of issuer

D Location of train

E Unique identification

European Instruction 5 – Obligation to run with speed restriction

N

Run with a maximum speed of

x.31 km/h/200

between/in

x.32 location/km/Signal

and

x.33 location/km/Signal

until

x.34 location/km

from

x.35 location/km/Signal

to

x.36 location/km/Signal

inside board

x.37 Yes

x.38 No

Examine the line for the following reason

x.45

x.46 Free text

Report findings to

x.50

x.51 Free text

Additional instruction

x.40

x.41 Free text

M ID of Driver

N ID of Issuer

O Time

A Train No

B Date

C Location of issuer

D Location of Train

E Unique identification

European Instruction 6 – Obligation to run on sight

Run on sight

Between/in

and

on

From

to

Run with a maximum speed of

from

to

Examine the line for the following reason

Report findings to

Additional instruction

M ID of Driver

N ID of Issuer

O Time

A Train/Shunting movement No

B Date

C Location of issuer

D Location of Train/Shunting movement

E Unique identification

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

Is allowed to start in SR

x.10

Is allowed to overpass **GoA** at

x.20

x.21 **Entry/Signal**

Run with a maximum speed of

x.30

x.31 **km/h/text**

to

x.32 **Location/km/Signal**

to

x.33 **Location/km/Signal**

Is exempted from running on sight

x.40

Set SR speed to

x.50 **km/h/stop**

Set SR distance to

x.60 **m**

Additional instruction

x.80 **Free text**

M ID of Driver

N ID of issuer

O Time

A Train No**B** Date**C** Location of Issuer**D** Location of Train**E** Unique identification

8

European Instruction 8 – Permission to pass a defective level crossing

8.05

Stop before level crossing (at)

8.05 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

8.03

8.04 Location

8.0

8.15 Track/Line

8.25

Activate level crossing manually

x.00

I run with a maximum speed of

from

to

x.01 km/h/sph

x.02 Location/km/signal

x.03 Location/km/signal

8.70

Activate audible warning device

0000

8.71 Km/Signal

to

8.72 Km/Signal

8.90

Pass level crossing

x.90

Additional instruction

x.91 km/sph

M ID of Driver**N** ID of Issuer**O** Time

A Train No

B Date

C Location of issuer

D Location of Train

E Unique identification

European Instruction 9 – Obligation to run with power supply restriction

Run with lowered pantograph

9.10

Run with "main switch off"

9.15

Reduce power consumption in

9.20

9.21 Value

%/Amp./KVA

9.22 Measure/Unit

Between/in

and

on

9.23 Location/Km/Signal

9.24 Location/Km/Signal

9.25 Track/Line

Lineside boards

9.26 Yes

9.26 No

Examine the line for the following reason

9.45

9.46 Free text

Report findings to

9.50

9.51 Free text

Additional instruction

9.55

9.57 Free text

M ID of Driver

N ID of Issuer

O Line

Written orders

~~6.1— A written order must only be issued when the train is at a standstill and shall be attributed with a unique identification or authorisation number provided by the signaller.~~

~~6.2— A written order takes precedence over the related indications provided by trackside signals and/or the DMI except when a lower permitted speed or a lower release speed than the maximum speed prescribed in the written order is applicable.~~

~~6.3— A written order should be issued as close as practicable to the affected area.~~

~~6.4— A written order must only be issued when the driver has identified the train running number and the location of the train / shunting movement.~~

~~6.5— A written order must state the following as a minimum:~~

~~from where it was issued (signal box...);~~

~~at what time and date it was issued;~~

~~to which train / shunting movement it refers;~~

~~where that train / shunting movement is located;~~

~~at which location it applies;~~

~~clear, precise, unambiguous instructions;~~

~~unique identification or an authorisation number.~~

~~6.6— A written order may be transmitted:~~

~~physically on paper; or~~

~~as verbal instructions to the driver to write down; or~~

~~other safe methods of communication to meet the above mentioned requirements.~~

~~6.7— When the driver receives a written order the driver shall check that this written order refers to his train / shunting movement and its current location.~~

~~6.8— A written order that has been issued can only be revoked by a new written order explicitly referring to the previous one.~~

Terms (written orders)

~~Standard terminology to be used in the communication procedure~~

Cancelling a written order

~~7.1— Term used to cancel the written order procedure underway:~~

~~cancel procedure~~

~~7.2— If the message is then subsequently to be resumed, the procedure shall be repeated from the start.~~

Error during transmission

~~7.3— When a transmission error is discovered by the sender, the sender must request cancellation by sending the following procedure message:~~

~~error (+ prepare new form~~

~~or:~~

~~error + I say again~~

and then send the initial message again.

Error during read back

7.4 — When the sender discovers an error whilst the message is being read back, the sender shall send the following procedure messages:

error +I say again

and send the initial message again.

Misunderstanding

7.5 — If one of the parties does not fully understand a message he must ask the other party to repeat the message by using the following text:

say again (+speak slowly)

7. Communication of an operational instruction

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

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

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 RU 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.

~~6. BOOK OF FORMS~~

~~8.1 The Infrastructure Manager is responsible for drawing up the Book of Forms and the forms themselves in its operating language.~~

~~8.2 All the forms to be used shall be assembled in a document or a computer medium called the Book of Forms.~~

~~8.3 In order to identify the forms, a unique code word or number relating to the procedure shall be developed.~~

~~8.4 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.~~

~~8.5 The Book of Forms shall comprise two parts.~~

~~8.5.1 The first part contains at least the following items:~~

- ~~— an index of written order Forms;~~
- ~~— a list of situations to which each Form applies;~~
- ~~— the table containing the international phonetic alphabet.~~

~~8.5.2 The second part contains the Forms themselves. These must be collected by the RU and given to the driver.~~

~~7. GLOSSARY OF RAILWAY TERMINOLOGY~~

~~9.1 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.~~

~~9.2 The glossary shall be composed of two parts:~~

- ~~— a listing of terms by subject matter;~~
- ~~— a listing of the terms in alphabetical order.~~

|

EN

EN

Appendix D

Elements ~~the Infrastructure Manager has to provide to the Railway Undertaking for the Route Book and~~ for the train compatibility over the route intended for operation and for the Route Book

Appendix D.1

Elements for the vehicle and train compatibility over the route intended for operation

Notes:

- The route compatibility check interfaces elements indicated with * on the table below are impacted each time the train composition changes.

<u>Route compatibility check interface</u>	<u>Vehicle information available in the full accompanying file of the application for authorisation</u>	<u>Route information available in Register of Infrastructure (RINF) or provided by Infrastructure Manager until RINF is complete</u>
<u>Traffic loads and load carrying capacity of infrastructure*</u>	<u>Design mass:</u> - <u>in working order;</u> - <u>under normal payload;</u> - <u>under exceptional payload;</u> <u>Maximum design speed;</u> <u>Static axle load :</u> - <u>in working order;</u> - <u>under normal payload;</u> - <u>under exceptional payload;</u> <u>Vehicle length;</u> <u>The position of the axles along the unit (axle spacing).</u> <u>Static compatibility check for Wagons:</u> <u>Permissible payload for different line categories according to TSI WAG.</u>	<u>1.1.1.1.2.4 Load capability</u> <u>1.1.1.1.2.4.1 National classification for load capability</u>
	<u>The static and dynamic compatibility checks shall be performed according to the procedures provided by the infrastructure manager.</u>	

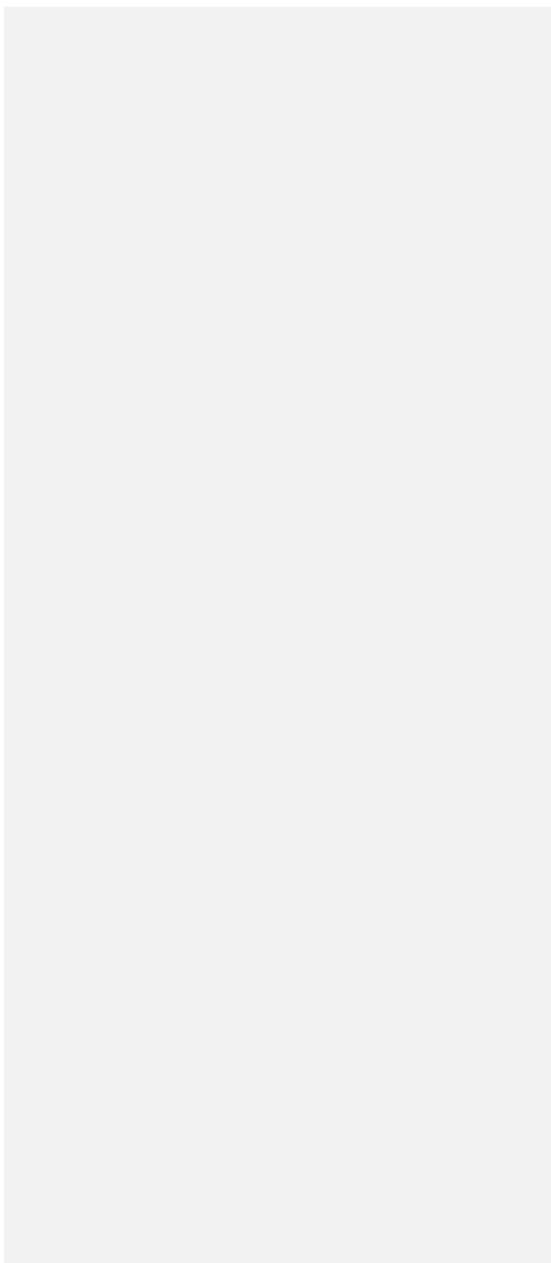
<u>Route compatibility check interface</u>	<u>Vehicle information available in the full accompanying file of the application for authorisation</u>	<u>Route information available in Register of Infrastructure (RINF) or provided by Infrastructure Manager until RINF is complete</u>
<u>Gauging *</u>	<u>Vehicle gauge :</u> - <u>Reference profiles for which the vehicle was authorised;</u> - <u>other gauges assessed.</u>	<u>1.1.1.1.3.1.1 gauging</u> <u>1.2.1.0.3.4 gauging</u>
	<u>Note. It is expected that geometry of particular points (e.g. section of tunnel, bridges) is covered by the reference profile declared in RINF. In duly justified cases, discussion between Infrastructure Manager and Railway Undertaking might be needed for checking these specific points.</u>	
<u>Vertical radius</u>	<u>Minimum vertical:</u> - <u>convex curve radius capability</u> - <u>concave curve radius capability</u>	<u>1.2.2.0.3.3 Minimum radius of vertical curve (Concern siding)</u>
<u>Train detection systems *</u>	<u>Type of train detection systems for which the vehicle has been designed and assessed</u>	<u>1.1.1.3.7.1 Type of train detection system</u>
	<u>Note. In duly-justified cases, tests and/or checks could be done after authorisation, involving Railway Undertaking and Infrastructure Manager.</u>	
<u>Hot axle box detection</u>	<u>Axle bearing condition monitoring (hot axles box detection)</u>	<u>1.1.1.1.7.4 Existence of trackside Hot axle box detection</u>
	<u>Note: 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.</u>	
<u>Running characteristics</u>	<u>Combination(s) of maximum speed and maximum cant deficiency to which the vehicle was authorised (operational envelope that the vehicle has been assessed for);</u> <u>Rail inclination.</u>	<u>1.1.1.1.4.2 Cant deficiency</u> <u>1.1.1.1.2.5 Maximum permitted speed</u> <u>1.1.1.1.4.3 Rail inclination</u>
<u>Wheelset</u>	<u>Wheel set gauge</u>	<u>1.1.1.1.4.1 Nominal track gauge</u> <u>1.2.1.0.4.1 Nominal track gauge</u>
<u>Wheelset</u>	<u>Minimum in-service wheel diameter</u>	<u>1.1.1.1.5.2 Minimum wheel diameter for fixed obtuse crossings</u>
<u>Wheelset</u>	<u>Type of changeover facilities to which the vehicle is designed for</u>	<u>1.2.0.0.0.5 Geographical location of Operational Point</u> <u>1.2.0.0.0.4.1 Type(s) of track gauge changeover facility (ies).</u>
<u>Minimum curve*</u>	<u>Minimum horizontal curve radius capability</u>	<u>1.1.1.1.3.7 Minimum radius of horizontal curve</u> <u>1.2.2.0.3.2 Minimum radius of horizontal curve</u>

<u>Route compatibility check interface</u>	<u>Vehicle information available in the full accompanying file of the application for authorisation</u>	<u>Route information available in Register of Infrastructure (RINF) or provided by Infrastructure Manager until RINF is complete</u>
<u>Braking*</u>	<p>At maximum service brake: Stopping distance, Maximum deceleration, for the load condition ‘design mass under normal payload’ at the design maximum speed.</p> <p>For general operation, in addition to the above data: brake weight percentage (λ).</p> <p>For General operation: covered by Railway Undertaking safety management system using the CSM on risk assessment. See clause 4.2.2.6 and TSI OPE application guide clause 6.</p> <p>For pre-defined formation: <u>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.</u></p>	<p><u>1.1.1.3.11.1 Maximum braking distance requested</u></p> <p><u>1.1.1.1.3.6 Gradient profile</u></p> <p><u>1.1.1.1.2.5 Maximum permitted speed</u></p> <p><u>1.1.1.1.6.1 Maximum train deceleration</u></p> <p><u>1.1.1.3.11.2 Availability by the IM of additional information mentioned in the section 4.2.2.6.2.(2) is available or not (Y/N)</u></p> <p><u>If yes:</u></p> <p><u>1.1.1.3.11.3 Reference of the document(s) to be indicated in RINF.</u></p>
<u>Braking</u>	<p>Thermal capacity:</p> <ul style="list-style-type: none"> - <u>Reference case of TSI;</u> - <u>if no reference case is indicated, thermal capacity expressed in terms of:</u> <ul style="list-style-type: none"> o <u>Speed;</u> o <u>Gradient;</u> o <u>Distance;</u> o <u>Time (if distance is not indicated)</u> 	<p><u>1.1.1.1.3.6 Gradient profile</u></p> <p><u>1.1.1.1.2.5 Maximum permitted speed</u></p>
<u>Braking *</u>	<u>Maximum gradient on which the unit is kept stationary by the parking brake alone (if the vehicle is fitted with it)</u>	<p><u>1.1.1.1.3.6 Gradient profile</u></p> <p><u>1.2.2.0.3.1 Gradient for stabling tracks</u></p>
<u>Magnetic track brake</u>	<p><u>Possibility of preventing the use of the magnetic brake (only if fitted with magnetic brake)</u></p> <p><u>Note: where magnetic brake is allowed, the infrastructure manager shall provide the conditions of its use.</u></p>	<u>1.1.1.1.6.3 Use of magnetic brakes</u>
<u>Eddy current track brake</u>	<p><u>Possibility of preventing the use of the eddy current brake (only if fitted with eddy current brake)</u></p> <p><u>Note: where Eddy current track brake is allowed, the infrastructure manager shall provide the conditions of its use.</u></p>	<u>1.1.1.1.6.2 Use of eddy current brakes</u>
<u>Weather conditions</u>	<u>Temperature range</u>	<u>1.1.1.1.2.6 Temperature range</u>

<u>Route compatibility check interface</u>	<u>Vehicle information available in the full accompanying file of the application for authorisation</u>	<u>Route information available in Register of Infrastructure (RINF) or provided by Infrastructure Manager until RINF is complete</u>
<u>Weather conditions</u>	<u>Snow, ice and hail condition</u>	<u>1.1.1.1.2.8 Existence of severe climatic conditions</u>
<u>Voltages and frequencies</u>	<u>Energy supply system :</u> - <u>Nominal voltage and frequency;</u> - <u>Type of contact line system</u> - _____	<u>1.1.1.2.2.1.1 Type of contact line system</u> <u>1.1.1.2.2.1.2 Energy supply system (Voltage and frequency)</u>
<u>Regenerative brake</u>	<u>Possibility of preventing the use of the regenerative brake (only if fitted with regenerative brake)</u>	<u>1.1.1.2.2.4 Permission for regenerative braking</u>
<u>Current limitation</u>	<u>Electric units equipped with power or current limitation function.</u> <u>Note: TSI-compliant Rolling Stock with a maximum power higher than 2MW are equipped with current or power limitation.</u>	<u>1.1.1.2.5.1 Current or power limitation on board</u>
<u>Pantograph*</u>	<u>Maximum current at standstill per pantograph for each DC systems the vehicle is equipped for</u>	<u>1.1.1.2.2.3 Maximum current at standstill per pantograph</u>
<u>Pantograph</u>	<u>Height of interaction of pantograph with contact wires (over top of rail) for each energy supply system the vehicle is equipped for</u>	<u>1.1.1.2.2.5 Maximum contact wire height</u> <u>1.1.1.2.2.6 Minimum contact wire height</u>
<u>Pantograph</u>	<u>Pantograph head for each energy supply system the vehicle is equipped for</u>	<u>1.1.1.2.3.1 Accepted TSI compliant pantograph heads</u> <u>1.1.1.2.3.2 Accepted other pantograph heads</u>
<u>Pantograph</u>	<u>Material of pantograph contact strip the vehicle may be equipped with for each energy supply system the vehicle is equipped for</u>	<u>1.1.1.2.3.4 Permitted contact strip material</u>
<u>Pantograph*</u>	<u>Mean contact force curve</u>	<u>1.1.1.2.5.2 Contact force permitted</u>

<u>Route compatibility check interface</u>	<u>Vehicle information available in the full accompanying file of the application for authorisation</u>	<u>Route information available in Register of Infrastructure (RINF) or provided by Infrastructure Manager until RINF is complete</u>
<u>Pantograph*</u>	<p><u>Number of pantographs in contact with the overhead contact line (OCL) (for each energy supply system the vehicle is equipped for);</u></p> <p><u>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);</u></p> <p><u>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).</u></p>	<u>1.1.1.2.3.3 Requirements for number of raised pantographs and spacing between them, at the given speed</u>
<u>Pantograph</u>	<u>Automatic dropping device (ADD) fitted (for each energy supply system the vehicle is equipped for)</u>	<u>1.1.1.2.5.3 Automatic dropping device required</u>
<u>Tunnel</u>	<u>Fire safety category</u>	<u>1.1.1.1.8.10 Fire category of rolling stock required</u> <u>1.1.1.1.8.11 National fire category of rolling stock required</u> <u>1.2.1.0.5.7 Fire category of rolling stock required</u> <u>1.2.1.0.5.8 National fire category of rolling stock required</u>
<u>Vehicle length*</u>	<u>Unit length</u>	<u>1.2.2.0.2.1 Usable length of siding</u> <u>1.2.1.0.6.4 Usable length of platform</u>
<u>Platform height and access and egress</u>	<u>Platform heights for which the vehicle is designed</u>	<u>1.2.0.6.4 Height of platform</u>
<u>ETCS</u>	<u>ETCS System Compatibility</u>	<u>1.1.1.3.2.9 ETCS System Compatibility</u>
<u>ETCS*</u>	<u>Train Integrity</u>	<u>1.1.1.3.2.8 Train integrity confirmation from on-board necessary for line access</u>
<u>GSM-R</u>	<u>Radio System Compatibility Voice</u>	<u>1.1.1.3.3.9 Radio System Compatibility Voice</u>
<u>GSM-R</u>	<u>Radio System Compatibility Data</u>	<u>1.1.1.3.3.10 Radio System Compatibility data</u>
<u>GSM-R</u>	<u>SIM Card GSM-R Home Network</u>	<u>1.1.1.3.3.5 GSM-R networks covered by a roaming agreement</u>

<u>Route compatibility check interface</u>	<u>Vehicle information available in the full accompanying file of the application for authorisation</u>	<u>Route information available in Register of Infrastructure (RINF) or provided by Infrastructure Manager until RINF is complete</u>
<u>GSM-R</u>	<u>Sim card support of Group ID 555</u>	<u>1.1.1.3.3.4 Need of Group 555</u>
<u>Class B</u>	<u>Class B train protection legacy system</u>	<u>1.1.1.3.5.3 Train protection legacy systems</u>
<u>Class B</u>	<u>Class B radio legacy system</u>	<u>1.1.1.3.6.1 Radio legacy system</u>



Appendix D.2
Elements the Infrastructure Manager has to provide to the Railway Undertaking for the
Route Book

<i>Number</i>	<i>TitleRoute Book</i>
1	Generic information regarding the IM
1.1	IM's Name
1.2	Member State
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
2.3.9	Length of loops
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(s)/Speeds according to allocated path timetable
3.1.5	Any other information the driver shall be aware of
3.1.6	Specific geographical information required on the local infrastructure
3.1.7	Special restrictions for dangerous goods
3.1.8	Special loading restrictions

3.1.79	Means of Communication with the traffic management/control centre in normal, degraded and emergency situation
3.2	Specific Technical Characteristics
3.2.1	Track gauge
3.2.2	Structure gauge
3.2.3	Maximum axle load
3.2.4	Maximum load per linear meter
3.2.5	Maximum cant deficiency
3.2.6	Minimum radius of curvature
3.2.17	Gradient percentage
3.2.28	Gradient location
3.2.9	Braking performance related information
3.2.10	For brake system that does not use wheel-rail adhesion, accepted braking effort
3.2.311	Tunnels: fire safety categorisation and tunnel-related data in clause 4.2.1.2.2.1c
3.2.412	Non-stopping areas: identification, location, type
3.2.513	Industrial risks – locations where it is dangerous for the driver to step out
3.2.614	Locations of areas designated for testing the sanding device (if existing)
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 must 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
3.3.9	Requirements for number of raised pantographs and spacing between them
3.3.10	Contact wire height
3.3.11	Characteristics of pantograph accepted
3.3.12	Mean contact force permitted
3.4	Control-Command and Signalling subsystem
3.4.1	Need for more than one system active simultaneously
3.4.2	Level of application
3.4.3	Optional functions required on-board: infill
3.4.4	Software version number

3.4.5	Version number
3.4.6	System name
3.4.7	Software version number
3.4.8	System name
3.4.9	Software version number
3.4.10	Class B train protection, control and warning systems
3.4.2.11	Special conditions to switch over between different class B train protection, control and warning systems
3.4.3.12	Special technical conditions required to switch over between ERTMS/ETCS and Class B systems
3.4.4.13	Special instructions (location) to switch over between different radio systems
3.4.5.14	Permissibility to use Eddy-current brake
3.4.6.15	Permissibility to use magnetic brake
3.5	Operation and Traffic Management subsystem
3.5.1	Operating language
3.5.2	Special climatic conditions and associated arrangements, if any

Appendix E

Language and communication level

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

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

Appendix F:

Minimum elements relevant to professional qualification for the tasks associated with “accompanying trains”

1. GENERAL REQUIREMENTS

- (a) This Appendix, which **must** ~~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 TSI, refers to those elements that are important to ensure that operational staff are trained and able to understand and discharge the tasks.
- (c) Rules and procedures apply to the tasks being performed and to the person carrying out the tasks. These tasks may be carried out by any authorised qualified person irrespective of any name, job title or grade used in rules or procedures or by the individual company.

2. PROFESSIONAL KNOWLEDGE

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

2.1. General professional knowledge

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

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

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

2.3. Knowledge of rolling stock

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

2.4. Knowledge of the route

- (a) Relevant operational arrangements (such as the method of train despatch) at individual locations (station equipment and signalling etc.).
- (b) Stations at which passengers may alight or board the train.

- (c) Local operating and emergency arrangements specific to the line(s) of route.

2.5. Knowledge on passenger safety

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

- (a) Principles to ensure the safety of passengers:
 - Support Passengers with Reduced Mobility;
 - Identify the hazards;
 - Procedures applicable to accidents involving persons;
 - Events of a fire and/or smoke;
 - Evacuation of passengers.
- (b) Principles of communication:
 - Identify who needs to be contacted and understand communication methods, especially with the signaller during an evacuation incident;
 - Identify causes/situations and requests to initiate communication
 - Communication methods for informing passengers;
 - Communication methods in degraded operations/emergency situations.
- (c) Behavioural skills:
 - Situational awareness;
 - Conscientiousness;
 - Communication;
 - Decision making and action.

3. ABILITY TO PUT THE KNOWLEDGE INTO PRACTICE

The ability to apply this knowledge in normal, degraded and emergency situations will 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 mustshall be made in writing, in the language chosen by the Railway Undertaking.

Appendix G

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

1. GENERAL REQUIREMENTS

- (a) This Appendix, which ~~must~~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 TSI, refers to those elements that are important to ensure that operational staff are trained and able to understand and discharge the elements of the task.
- (c) Rules and procedures apply to the task being performed and to the person carrying out the task. These tasks may be carried out by any authorised qualified person irrespective of any name, job title or grade used in rules or procedures or by the individual company.

2. PROFESSIONAL KNOWLEDGE

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

2.1. General professional knowledge

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

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

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

2.3. Knowledge of train equipment

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

3. ABILITY TO PUT THE KNOWLEDGE INTO PRACTICE

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

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

In particular:

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

Appendix H

European Vehicle Number and linked alphabetical marking on the bodywork

1. GENERAL PROVISIONS ON THE EUROPEAN VEHICLE NUMBER

The European Vehicle Number is assigned according to the codes defined in Decision 2007/756/EC, Appendix 6.

The European Vehicle Number shall be changed when it does not reflect the interoperability capability or technical characteristics according to this Appendix due to technical modifications of the vehicle. Such technical modifications may require a new placing ~~in~~ service on the market according to Articles ~~210 to 25~~ of Directive ~~(EU) 2016/797~~ (EU) 2008/57/EC

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 can 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 ~~must~~ 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 NVR-decision 2007/756/EC, Appendix 6, part 4.

RFC, DB and ACTS stand for the keeper marking as set out in NVR-decision 2007/756/EC, 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 ~~must~~ shall be shown after the international letter marking and separated from it by a hyphen as follows:

01 87 3320 644-7

TEN F-SNCF Ks-xy

4. COACHES AND HAULED PASSENGER STOCK

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

F-SNCF 61 87 20 - 72 021 - 7

B¹⁰ 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 ~~must~~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.

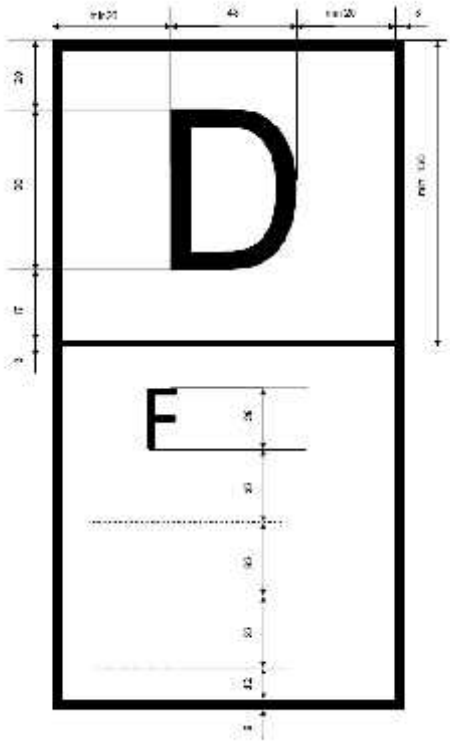
~~(a) — complies with all relevant TSIs which are in force at the moment of placing in service and has been authorised to be placed in service in accordance with Article 22(1) of Directive 2008/57/EC, and~~

~~(a) — is provided with an authorisation valid in all Member States in accordance with Article 23(1) of Directive 2008/57/EC.~~

'PPV/PPW': Vehicle which complies with PPV/PPW or PGW agreement (inside OSJD States). (original: PPV/PPW: (

); PGW:)

Vehicles which are ~~not provided with an authorisation valid for an area of use which does not cover authorised to be placed in service in all Member States in accordance with Article 23(1) of Directive 2008/57/EC~~ need a marking indicating the Member States where the vehicle is authorised to be placed in service. 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 2007/756/EC, Appendix 6, part 4.



EN

EN

Appendix I

List of open

List of areas for which national rules are permitted according to article 8 of Directive (EU) 2016/798

In accordance with Article 8.4. of Directive (EU) 2016/798 and Articles 13 (5) and 25 of the Agency Regulation 2016/ 796Articles 13 (5) and 25. Member States shall submit the draft of a new national rule to the Agency and the Commission before the expected introduction into the national legal system of the proposed new rule and providing justification for its introduction.

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 the TSI

Operation during works

Safe operation of test train

Train visibility – Front end (see 4.2.2.1.2)

Existing vehicles

Train visibility – Rear end (see 4.2.2.1.3)

System in use steady red lights or reflective plates

Existing vehicles

Managing an emergency situation (see point 4.2.3.7)

Role of local/national authorities and emergency services

Safety-related communications terminology (see Appendix C)

National operational instructions

2. List of open points

Exceptional transport

Timetable (see 4.2.1.2.3)

Additional information

Recording of supervision data outside the train (see 4.2.3.5.1)

Additional information

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

Additional information

Professional competences (see point 4.6)

- Staff with safety critical tasks other than train drivers;
- Additional information for staff undertaking the safety critical tasks associated with accompanying a train other than train driver;
- Additional information for staff undertaking the safety critical tasks associated with the last preparation of a train before it is scheduled to cross a border and work beyond any location(s) designated as the “frontier” in the network statement of an infrastructure manager and included in his 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).

Rules under Annex C (see Appendix A)

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

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

Safety-related communications terminology (see Appendix C)

Additional terms

points

Appendix B (see point 4.4)

Common operational principles and rules

Appendix J

Glossary

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

Term	Definition
Accident	As defined in Article 3 of Directive (EU) 2016/7982004/49/EC .
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 can be gained as part of the training process.
Dangerous goods	As covered by Directive 2008/68/EC of 24 September 2008 on the inland transport of dangerous goods
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.
<u>End of authority passed without permission</u>	<p><u>An end of authority passed without permission is any occasion when a train proceeds beyond the end of authority in the following circumstances:</u></p> <ul style="list-style-type: none"><u>– A trackside signal at danger, or an order to STOP where an ATP is not operational,</u><u>– The end of a movement authority provided in an ATP,</u><u>– A point communicated by verbal or written authorisation laid down in regulations,</u><u>– Stop boards,</u><u>– Hand signals.</u> <p><u>This covers movement authority as described in ETCS and authority to move covered by instructions/signalling.</u></p> <p><u>Any case in which a vehicle without any traction unit attached or a train that is unattended runs away is not included.</u></p>
<u>European instruction</u>	<u>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.</u>
<u>Evacuation</u>	<u>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 IM staff, that it is safe to do so.</u>

Term	Definition
Exceptional loads 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. A load carried on a rail vehicle, for example a container, swap body or other traffic where the rail vehicle size and/or axle loading requires special authority for the movement and/or the application of special conditions of travel for all or part of the journey.
Health and Safety Conditions	In the context of this TSI, 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 2004/49/EC .
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.
<u>National instruction</u>	<u>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.</u>
Operating Language	The language or languages used in daily operation an Infrastructure Manager and published in his Network Statement, for the communication of operational or safety related messages between the staff of the Infrastructure Manager and the Railway Undertaking.
<u>Operational instruction</u>	<u>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.</u>
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 the health, and safety of persons <u>railway safety</u> .

Term	Definition
Scheduled stop	Planned stop for commercial or operational reasons.
Siding	Any track(s) within an operational point which is used only for movement other than train movement.
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 TSI.
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 formation of the train composition matches the train's designated <u>route/path(s)way</u> . Train preparation also includes technical inspections carried out prior to the train entering service.

Abbreviation	Explanation
AC	Alternating current
<u>ATP</u>	<u>Automatic Train Protection</u>
CCS	Control-Command and Signalling
CEN	European Committee for Standardisation (Comité Européen de Normalisation)
COTIF	Convention Concerning International Carriage by Rail (COntention relative aux

Abbreviation	Explanation
	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
ENE	Energy
ERA	European Union Agency for Railways Agency
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
HABD	Hot Axle Box Detector
Hz	Hertz
IM	Infrastructure Manager
INF	Infrastructure
OPE	Operation and Traffic Management
OSJD	Organisation for Co-operation of Railways
PPV / PPW	Russian abbreviation for Правила Пользования Вагонами в международном сообщении = Rules for use of railway vehicles in international traffic
RST	Rolling Stock
RU	Railway Undertaking
SMS	Safety Management System
SPAD	Signal Passed at Danger

Abbreviation	Explanation
SRS	System Requirement Specification
TAF	Telematic Applications for Freight
TEN	Trans-European Network
<u>TPS</u>	<u>Train Protection System</u>
TSI	Technical Specification for Interoperability
UIC	International Union of Railways (Union Internationale des Chemins de fer)
<u>VKM</u>	<u>Vehicle Keeper Marking</u>