Railway Interoperability – The Railways (Interoperability) Regulations 2011

Notice to all:
- Manufacturers and distributors of railway equipment
- Infrastructure managers and railway undertakings
- Railway infrastructure and train: builders, designers, operators, owners and managers
- Certifying authorities, approved bodies and notified bodies, recognised organisations and railway consultants

This Notice should be read with the Railways (Interoperability) Regulations 2011 and other relevant National Technical Specifications Notices (NTSNs). Unless otherwise defined, expressions used in this NTSN have the same meaning as in the Railways (Interoperability) Regulations 2011.

Summary
This Notice has been published by the Secretary of State for Transport pursuant to regulation 3B of the Railways (Interoperability) Regulations 2011 and comes into force on exit day.

The objective of the Railways (Interoperability) Regulations 2011 is to enhance the interoperability of the rail system through the uniform application of technical standards relating to railway equipment to be placed into service in the UK.

This Notice provides technical information on the features required relating to the operation of trains on the rail system to meet the essential requirements set out in Schedule 2 to the Railways (Interoperability) Regulations 2011.

This Notice replaces and substantially reproduces the provisions of Commission 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 and amending Decision 2007/756/EC (OPE TSI), as it had effect immediately before exit day. Notwithstanding the publication of Implementing Regulation (EU) 2019/773, Commission Decision 2012/757/EU was the applicable standard immediately before 31 October 2019 (see Article 5 of Implementing Regulation (EU) 2019/773).

The specific cases that were included in the OPE TSI that are relevant to the UK have been retained as UK specific cases. The specific cases for EU Member States have not been included as they are not relevant to this Notice.
Operation and Traffic Management
National Technical Specification Notice

Article 1

Subject matter

This National Technical Specification Notice (NTSN) concerns the “operation and traffic management” subsystem of the rail system, as set out in Annex I.

Article 2

Scope

1. The NTSN set out in Annex I shall apply to the “operation and traffic management” subsystem of the rail system as defined in paragraph 2 of Schedule 3 to the Railways (Interoperability) Regulations 2011.

2. The NTSN shall apply to the rail system as defined in the Railways (Interoperability) Regulations 2011, and excludes the cases referred to in regulation 3(2) and 3(5) of the Railways (Interoperability) Regulations 2011.

Article 3

Open points

1. With regard to the issues classified as “open points” referred to in Appendix I of Annex I, the conditions to be complied with for verifying the interoperability in accordance with regulation 15 of the Railways (Interoperability) Regulations 2011 shall be the applicable national technical rules.

Article 3a

UK Specific cases

1. With regard to UK specific cases referred to in point 7.3 of Annex I, the conditions to be met for the verification of interoperability in accordance with regulation 15 of the Railways (Interoperability) Regulations 2011 shall be as set out in the national technical rules in force in the UK.

Article 3b

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Article 3c

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Article 3d

Implementation

1. For the purpose of this NTSN, the implementation plan published in September 2016 continues to apply.

Article 4

This NTSN, published by the Secretary of State on 31 October 2019 in accordance with regulation 3B of the Railways (Interoperability) Regulations 2011, replaces Decision 2012/757/EU\(^1\) as the relevant standard to be complied with in relation to the technical specifications for interoperability relating to the ‘operation and traffic management’ subsystem of the rail system.

Where relevant, the text from sections 4.2.2.1.3.2 and 4.4 of the Annex to Commission Implementing Regulation (EU) 2019/773 that were applicable at 31 October 2019 have been incorporated into this NTSN.

Decisions 2008/231/EC\(^2\) and 2011/314/EU\(^3\) were repealed with effect from 1 January 2014.

Article 5

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Article 6

1. The European Union Agency for Railways has published on its website the lists of codes referred in parts 9, 10, 11, 12 and 13 of Appendix 6 of the Annex to Decision 2007/756/EC.\(^4\)

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\(^1\) Commission Decision 2012/757/EU of 14 November 2012 concerning the technical specification for interoperability relating to the operation and traffic management subsystem of the rail system in the European Union and amending Decision 2007/756/EC. This EU legislation is retained EU law under section 3 of the European Union (Withdrawal) Act 2018.\(^\)


\(^3\) Commission Decision 2011/314/EU of 12 May 2011 concerning the technical specification for interoperability relating to the ‘operation and traffic management’ subsystem of the trans-European conventional rail system. Repealed on 1 January 2014.

\(^4\) Commission Decision 2007/756/EC of 9 November 2007 adopting a common specification of the national vehicle register provided for under Articles 14(4) and (5) of Directives 96/48/EC and
Article 7
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Article 8
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2001/16/EC. This EU legislation is retained EU law under section 3 of the European Union (Withdrawal) Act 2018.
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1. INTRODUCTION

1.1. Technical scope

This National Technical Specification Notice (NTSN) concerns the “operation and traffic management” subsystem shown in the list contained in Schedule 3 to the Railways (Interoperability) Regulations 2011. Further information on this subsystem is provided in Chapter 2.

1.2. Geographical scope

The geographical scope of this TSI is the network of the whole rail system and excludes the cases referred to in regulation 3(2) and 3(5) of the Railways (Interoperability) Regulations 2011.

1.3. This provision has been left intentionally blank

2. DESCRIPTION OF SUBSYSTEM/SCOPE

2.1. Subsystem

The “operation and traffic management” subsystem is described in Schedule 3 to the Railways (Interoperability) Regulations 2011 as:

“The procedures and related equipment enabling 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 services.”

2.2. Scope

This NTSN 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 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.

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For those staff undertaking the safety-critical tasks associated with despatching trains and authorising train movements, recognition of professional qualifications and health and safety conditions may apply between the UK and other countries.

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 taking into account any recognition agreements between the UK and other countries in relation to point 4.7, The train will not be considered to be a cross-border service, if all the vehicles of the train crossing the state border cross it only to the "frontier" location(s).

2.2.2. Principles

This NTSN 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 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 2004/49/EC. The SMS itself is assessed by the safety authority before granting safety certificate/authorisation.

2.2.3. Applicability to existing vehicles and infrastructure

While the majority of the requirements contained in this NTSN 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 NTSNs covering other subsystems such as rolling stock. In the context of this NTSN it is their operational function that is considered.

3. ESSENTIAL REQUIREMENTS

3.1. Compliance with the essential requirements

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The rail system, its subsystems and their interoperability constituents must meet the essential requirements set out in general terms in Schedule 2 of the Railways (Interoperability) Regulations 2011.

3.2. Essential requirements — overview

The essential requirements cover:

— safety,
— reliability and availability,
— health,
— environmental protection,
— technical compatibility,
— accessibility.
The following table summarises the correspondence between the essential requirements set out in Schedule 2 to the Railways (Interoperability) Regulations 2011 and this NTSN.

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| 4.2.1.2.3 | Timetables | 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 |
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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/EU, it is the overall responsibility of the infrastructure manager to provide all the appropriate requirements which must 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 contribute 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 NTSN 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 must supply the driver with all the necessary information and documentation required to carry out his duties.

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

4.2.1.2.1 Driver’s Rule Book

All the necessary procedures for the driver must be included in a document or a computer medium called the “Driver’s Rule Book”.

The Driver’s Rule Book must 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 must 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 must 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 compile the Driver's Rule Book in such a way that the driver's application of all operational rules is enabled.

It must have two appendices:

— Appendix 1: Manual of communication procedures,
— Appendix 2: Book of Forms.

Predefined messages and forms must remain in the “operating” language of infrastructure manager(s).

The process for preparing and updating the Driver’s Rule Book must include the following steps:

— the infrastructure manager (or the organisation responsible for the preparation of the operating rules) must provide the railway undertaking with the appropriate information in the infrastructure manager’s operating language,
— the railway undertaking must 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 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 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 must 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 must 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 must, 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 must 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 infrastructure manager must provide the railway undertaking with at least the information for the Route Book as defined in Appendix D.

The following information must 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 Modifications to information contained within the Route Book

The infrastructure manager must advise the railway undertaking of any permanent or temporary modifications to information supplied in accordance with point 4.2.1.2.1.

These changes must be grouped by the railway undertaking into a dedicated document or computer medium whose format must 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.

4.2.1.2.3 Informing the driver in real time

The infrastructure manager must inform drivers of any changes to the line or relevant line-side equipment that have not been advised as modifications to information for the Route Book as set out in point 4.2.1.2.2.

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

Presentation to the driver must be consistent across all the lines over which the railway undertaking operates.
4.2.1.2.4 Rolling stock

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

— documents describing the Communications Principles (Appendix C);

— the document entitled Book of Forms.

The infrastructure manager must draw up these documents in his operating language.

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 (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 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 must 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 must 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 must be fitted with three lights in an isosceles triangle, as shown below. These lights must always be lit when the train is being driven from that end.
The front-end lights must optimise train detectability (marker lights), provide sufficient visibility for the train driver (head lights) by night and during low light conditions and must 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 LOC&PAS NTSN.

### 4.2.2.1.3 Rear end

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

![Rear end indication](image)

### 4.2.2.1.3.1 Passenger trains

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

### 4.2.2.1.3.2 Freight trains

The UK has a requirement for a rear end indication consisting of two steady red lights.

Reflective plates shall comply with Appendix E to the WAG NTSN.

The lamps shall be on the same height above buffer on the transversal axis.

### 4.2.2.1.3.3 Freight trains not crossing a border between the UK and EU Member States
The rule for freight trains in international traffic described in 4.2.1.3.2 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 must 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 must be possible from all driving positions.

4.2.2.3. **Vehicle identification**

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

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

4.2.2.5. **Train composition**

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.

Train composition requirements must take into account the following elements:

(a) the vehicles

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- all vehicles in the train must be in compliance with all the requirements applicable on the routes over which the train will run,

- all vehicles on the train must be fit to run at the maximum speed at which the train is scheduled to run;
(b) all vehicles on the train must be currently 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 of vehicles forming a train must comply with the technical 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 and axle load;

(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. Axle load limitations must be respected;

(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 kinematic envelope;

(i) the kinematic gauge of each vehicle (inclusive of any load) in the train must be within the maximum permissible for the section of route.

Additional constraints may be required or imposed due to the type of braking regime or traction type on a particular train.

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.

4.2.2.6. Train braking

4.2.2.6.1 Minimum requirements of the braking system

All vehicles in a train must be connected to the continuous automatic braking system as defined in the RST NTSN.

The first and last vehicles (including any traction units) in any train must have the automatic brake operative.
In the case of a train becoming accidentally divided into two parts, both sets of detached vehicles must 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 abovementioned 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 1 July 2015 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 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 immediately inform the infrastructure manager. The infrastructure manager may take appropriate measures to reduce the impact on the overall traffic on its network.

4.2.2.7. Ensuring that the train is in running order

4.2.2.7.1 General requirement

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

4.2.2.7.2 Data required

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 must advise the infrastructure manager(s) if a train will not occupy its allocated path or is cancelled.
4.2.2.8. Requirements for signal and line-side marker sighting

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

Therefore, signals, line-side markers, signs and information boards must be designed and positioned in such a consistent way to facilitate this. Issues that must 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 must be designed in such a consistent way that the driver is able to easily see the information displayed to him.

4.2.2.9. Driver vigilance

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

4.2.3. Specifications relating to train operations

4.2.3.1. Train planning

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

4.2.3.2. Identification of trains

Each train must be identified by a train running number. The train running number is given by the infrastructure manager when allocating a train path and must be known by the railway undertaking and all infrastructure managers operating the train. The train running number must 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 NTSN (hereinafter referred to as “CCS NTSN”).
4.2.3.3. Train departure

4.2.3.3.1 Checks and tests before departure
The railway undertaking must 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 must 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 must ensure the safe, efficient and punctual operation of the railway, including effective recovery from service disruption.

The infrastructure manager must 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 must:

(a) provide a means of real time recording of the times at which trains depart from, arrive at or pass appropriate predefined reporting points on their networks and the delta-time value;

(b) provide the specific data required in relation to train position reporting. Such information must 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 must 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 handover time

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

4.2.3.4.3 Dangerous goods

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

These procedures must include:
— the provisions as specified in Directive 2008/68/EC of the European Parliament and of the Council,
— advice to the driver of the presence and position of dangerous goods on the train,

---

— information the infrastructure manager requires for transport of dangerous goods,

— determination, in conjunction with the infrastructure manager, of lines of communication and planning of specific measures in case of emergency situations involving the goods.

4.2.3.4.4 Operational quality

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

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

Events that have significantly disrupted operations must 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 must 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 must 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 must 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 must 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 NTSN CCS and that are relevant considering the requirements in point 4.2.3.5 of this NTSN.

The data must be securely sealed and stored and accessible to authorised bodies including the Rail Accident Investigation Branch in carrying out their role pursuant to Article 19 of Directive 2004/49/EC.

4.2.3.5.1 Recording of supervision data outside the train

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

— the failure of line-side 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 must record the following data:

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

Further technical specifications concerning the recording device are set out in the LOC&PAS NTSN.
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) must 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 must 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, must 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 must be proportional to the nature and potential severity of the degradation.

These measures, which must 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 must 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 must include contact details both during and outside office hours.

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

The infrastructure manager must advise all the railway undertaking(s) of any changes to his details.
4.2.3.7. Managing an emergency situation

The infrastructure manager must, 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 must 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 must have processes to inform passengers about on-board emergency and safety procedures.

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

The railway undertaking must 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, the functional and technical specifications of the interfaces are as follows:
### 4.3.1. Interfaces with the infrastructure NTSN

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<tr>
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4.3.5. Interfaces with NTSN on Safety in Railway Tunnels

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4.4. Operating rules

4.4.1. Railway system operational principles and rules

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

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 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 must 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, must 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 must be sufficient for safety purposes.

(a) As a minimum this must 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, must 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 must 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 Regulations (EU) 1158/2010 and (EU) 1169/2010.

4.6.3.2. Analysis and update of training needs

Railway undertakings and infrastructure managers must 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 Regulations (EU) 1158/2010 and (EU) 1169/2010.

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9 Commission Regulation (EU) No 1158/2010 of 9 December 2010 on a common safety method for assessing conformity with the requirements for obtaining railway safety certificates. The EU legislation is retained EU law under section 3 of the European Union (Withdrawal) Act 2018, and it has been amended under that Act by the Rail Safety (Amendment etc.) (EU Exit) Regulations 2019.

10 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. The EU legislation is retained EU law under section 3 of the European Union (Withdrawal) Act 2018, and it has been amended under that Act by the Rail Safety (Amendment etc.) (EU Exit) Regulations 2019.
This analysis must 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 must define the process by which knowledge of on board staff of the routes worked over is acquired and maintained. This process must be:

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

For the tasks associated with “accompanying trains” and “preparing trains”, the elements that shall be considered can be found in respectively the appendices F and G. As appropriate, these elements must 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 must document those not deemed appropriate and the reasons why.

4.6.4. Auxiliary staff

The railway undertaking must 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 must have appropriate fitness to ensure that overall operational and safety standards are met.

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

Staff must 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 must 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 legislation of the applies with regard to defined limits of the abovementioned 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 must 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 must be taken into account:

(a) Cognitive:
   — attention and concentration,
   — memory,
   — perceptive capability,
   — reasoning,
   — communication.

(b) Psychomotor:
   — speed of reaction,
   — gestured coordination.

(c) Behavioural and personality
   — emotional self-control,
   — behavioural reliability,
   — autonomy,
— conscientiousness.

If any of those elements is omitted, the respective decision must 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 Safety Authority — 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 must 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 must 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 must 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 must 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 must 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 must not suffer from medical conditions or take medical treatment likely to cause:

— sudden loss of consciousness,
— impairment of awareness or concentration,
— sudden incapacity,
— impairment of balance or coordination,
— significant limitation of mobility.

The following vision and hearing requirements must be met:

4.7.3.2. Vision requirements

— aided or unaided distance visual acuity: 0,8 (right eye + left eye – measured separately), minimum of 0,3 for the worse eye,
— maximum corrective lenses: hypermetropia + 5 / myopia – 8. The medical doctor may allow values outside this range in exceptional cases and after having sought the opinion of an eye specialist,
— intermediate and near vision: sufficient whether aided or unaided,
— contact lenses are allowed,
— normal colour vision: using a recognised test, such as the Ishihara, completed by another recognised test if required,
— vision field: normal (absence of any abnormality affecting the task to be performed),
— vision for both eyes: effective,
— binocular vision: effective,
— contrast sensitivity: good,
— absence of progressive eye disease,
— lens implants, keratotomies and keratectomies are allowed only on condition that they are checked on a yearly basis or according to a frequency set by the medical doctor.

4.7.3.3. Hearing requirements

Sufficient hearing confirmed with tone audiogram, that is:

— hearing good enough to hold a phone conversation going and be able to hear alert tones and radio messages,

— the use of hearing aids is allowed.

4.8. Registers of infrastructure and vehicles

Due to the characteristics of the registers of infrastructure and vehicles, as defined in regulation 35 and 36 of the Railways (Interoperability) Regulations 2011, these registers are not suitable for the particular requirements of the operation and traffic management subsystem. Therefore this NTSN 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 must 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 must 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 regulation 2 of the Railways (Interoperability) Regulations 2011, “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; and 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 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 NTSN 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 Schedule 3 to the Railways (Interoperability) Regulations 2011.

In accordance with Articles 10 and 11 of Directive 2004/49/EC, railway undertakings and infrastructure managers must demonstrate compliance with the requirements of this NTSN within their safety management system when applying for any new or amended safety certificate or safety authorisation.

The common safety methods on conformity assessment require safety authorities to set up an inspection regime to supervise and monitor the day to day compliance with the safety management system including all NTSNs. It should be noted that none of the elements contained within this NTSN require separate assessment by an approved body.

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

7. IMPLEMENTATION

7.1. Principles

Implementation of this NTSN and conformity with the relevant points of this NTSN must be determined in accordance with the UK national implementation plan which was published in September 2016.

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 and signalling subsystems, requiring a corresponding set of operating procedures, are put into service.

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 NTSN;
(b) adaptation of any existing systems and processes to comply with the requirements of this NTSN;
(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, etc. (control-command and signalling),
   — new rolling stock (rolling stock)
7.3. UK Specific cases

7.3.1. Introduction

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

These UK specific cases belong to two categories:

(a) the provisions apply either permanently (case “P”), or temporarily (case “T”);
(b) in the temporary case the UK shall conform with the relevant subsystem by 2024 (case “T2”).

7.3.2. List of UK specific cases

7.3.2.1. This provision has been left intentionally blank

7.3.2.2. Temporary UK specific case (T2) (Great Britain and Northern Ireland)

For the implementation of point 4.2.3.2.1, United Kingdom are using alphanumeric numbers in the existing systems. The UK’s implementation plan sets out the requirements and time schedule for the transition from alphanumeric train running numbers to numeric train running numbers.

7.3.2.3. This provision has been left intentionally blank

7.3.2.4. This provision has been left intentionally blank
Appendix A

ERTMS/ETCS operating rules

Appendix B

Common operational principles and 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 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 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 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.

10. ASSISTANCE TO A FAILED TRAIN

(1) If a train is stopped by failure, the driver must immediately inform the signaller about the failure and the circumstances of the failure.
(2) When an assisting train is needed, the driver and signaller must 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 must 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 must 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 must 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 must 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 must have authorisation to pass a signal showing stop aspect/indication.

When giving authorisation, the signaller must give the driver any instructions concerning the movement.
The driver must apply the instructions and must not exceed any speed restriction, where one is imposed, until reaching the location where the normal operation can be resumed.

12. ANOMALIES IN LINE-SIDE 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 must 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 must 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 must stop and alert the signaller immediately to the danger.
Appendix C

Safety-related communications methodology

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
B Bravo
C Charlie
D Delta
E Echo
F Foxtrot
G Golf
H Hotel
I India
J Juliet
K Kilo
L Lima
4.3 The numbers shall be spoken digit by digit:

\[
\begin{align*}
0 &= \text{Zero} \\
1 &= \text{One} \\
2 &= \text{Two} \\
3 &= \text{Three} \\
4 &= \text{Four} \\
5 &= \text{Five} \\
6 &= \text{Six} \\
7 &= \text{Seven} \\
8 &= \text{Eight} \\
9 &= \text{Nine}
\end{align*}
\]

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

6.  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 abovementioned 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.

7. 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:
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:

```plaintext
error (+ prepare new form ...)
```

or:

```plaintext
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:

```plaintext
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:

```plaintext
say again (+ speak slowly)
```

**8. 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.

9. 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.
## 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

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Route Book</th>
<th>Train compatibility over route intended for operation</th>
</tr>
</thead>
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<td>1</td>
<td>Generic information regarding the IM</td>
<td></td>
<td></td>
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<tr>
<td>1.1</td>
<td>IM’s Name</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>Maps and diagrams</td>
<td></td>
<td></td>
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<tr>
<td>2.1</td>
<td>Map: schematic overview including</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1.1</td>
<td>Line sections</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2.1.2</td>
<td>Principal locations (stations, yards, junctions, freight terminals)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>Line diagram</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Information to be included on diagrams, supplemented as necessary by text. Where a separate station/yard/depot diagram is provided then information on line diagram may be simplified.*

| 2.2.1  | Indication of running lines, loops catch/trap points and access to sidings | X          | |
| 2.2.2  | Principal locations (stations, yards, junctions, freight terminals) and their position relative to the line | X          | |
| 2.2.3  | Location, type and name of all fixed signals relevant for trains           | X          | |
| 2.3    | Station/yard/depot diagrams                                                    |            | |

*Information to be identified on location specific diagrams, supplemented as necessary by text*

<p>| 2.3.1  | Name of location                                                               | X          | X          |</p>
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<thead>
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<th>Section</th>
<th>Description</th>
<th>X</th>
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<td>Type of location passenger terminal, freight terminal, yard, depot</td>
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<td>2.3.3</td>
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<td>2.3.5</td>
<td>Identification of platforms</td>
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<td>2.3.6</td>
<td>Length of platforms</td>
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<td>2.3.7</td>
<td>Height of platforms</td>
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<td>2.3.8</td>
<td>Identification of loops</td>
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<tr>
<td>2.3.9</td>
<td>Length of loops</td>
<td>X</td>
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<td>3</td>
<td><strong>Specific line segment information</strong></td>
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<td>3.1</td>
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<td>Maximum permissible speed(s)/Speeds according to allocated path timetable</td>
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<td>3.2.11</td>
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<td>3.2.12</td>
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<td>Section</td>
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<td>Restriction related to power consumption of specific electric traction unit(s)</td>
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<td>X</td>
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<td>3.3.5</td>
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<td>Need for more than one system active simultaneously</td>
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<td><strong>ERTMS/ETCS</strong></td>
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<td>3.4.2</td>
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<td>3.4.3</td>
<td>Optional functions required on board: infill</td>
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### Class B signalling systems

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### Class B radio systems

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### Speed restrictions related to braking performance

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<td>3.4.10</td>
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### Switch-overs

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<td>Special instructions (location) to switch over between different radio systems</td>
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### EMC Susceptibility of infrastructure-side control-command and signalling

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<td>3.4.14</td>
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<tr>
<td>3.4.15</td>
<td>Permissibility to use magnetic brake</td>
<td>X</td>
</tr>
</tbody>
</table>

### Operation and traffic management subsystem

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5.1</td>
<td>Operating language</td>
<td>X</td>
</tr>
<tr>
<td>3.5.2</td>
<td>Special climatic conditions and associated arrangements, if any</td>
<td>X</td>
</tr>
</tbody>
</table>
Appendix E

Language and communication level

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

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
</table>
| 5     | — can adapt the way he/she speaks to any interlocutor  
|       | — can put forward an opinion  
|       | — can negotiate  
|       | — can persuade  
|       | — can give advice  
| 4     | — can cope with totally unforeseen situations  
|       | — can make assumptions  
|       | — can express an argued opinion  
| 3     | — can cope with practical situations involving an unforeseen element  
|       | — can describe  
|       | — can keep a simple conversation going  
| 2     | — can cope with simple practical situations  
|       | — can ask questions  
|       | — can answer questions  
| 1     | — 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 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 NTSN, 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 must 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 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 NTSN, 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 Commission Decision 2007/756/EC\(^8\), 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 authorisation to place into service.

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 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:

<table>
<thead>
<tr>
<th>23. TEN</th>
<th>31. TEN</th>
<th>33. TEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 D-RFC</td>
<td>80 D-DB</td>
<td>84 NL-ACTS</td>
</tr>
<tr>
<td>7369</td>
<td>553-4</td>
<td>0691</td>
</tr>
<tr>
<td>235-2</td>
<td>4796</td>
<td>100-8</td>
</tr>
<tr>
<td>Zcs</td>
<td>Tanoos</td>
<td>Slpss</td>
</tr>
</tbody>
</table>

Where in the examples:

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

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>87</td>
<td>3320 644-7</td>
</tr>
<tr>
<td>TEN</td>
<td>F-SNCF</td>
<td>Ks-xy</td>
</tr>
</tbody>
</table>

4. COACHES AND HAULED PASSENGER STOCK

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F-SNCF</td>
<td>61 87 20 - 72 021 - 7</td>
</tr>
<tr>
<td></td>
<td>B10 tu</td>
</tr>
</tbody>
</table>

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 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.
Appendix I

List of open 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 NTSN OPE.*

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident</td>
<td>As defined in Article 3 of Directive 2004/49/EC.</td>
</tr>
<tr>
<td>Authorising train movements</td>
<td>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.</td>
</tr>
<tr>
<td>Competence</td>
<td>The qualification and experience necessary to safely and reliably undertake the task being performed. Experience can be gained as part of the training process.</td>
</tr>
<tr>
<td>Dangerous goods</td>
<td>As covered by Directive 2008/68/EC on the inland transport of dangerous goods</td>
</tr>
<tr>
<td>Degraded operation</td>
<td>Operation resulting from an unplanned event that prevents the normal delivery of train services.</td>
</tr>
<tr>
<td>Despatch (= dispatch)</td>
<td>See Train despatch</td>
</tr>
<tr>
<td>Driver</td>
<td>As defined in Article 3 of Directive 2007/59/EC.</td>
</tr>
<tr>
<td>Emergency call</td>
<td>Call set up in some dangerous situations to warn all trains/shunting movements in a defined area.</td>
</tr>
<tr>
<td>Exceptional loads</td>
<td>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.</td>
</tr>
<tr>
<td>Health and safety conditions</td>
<td>In the context of this NTSN, this refers only to the medical and psychological qualifications required to operate the relevant elements of the subsystem.</td>
</tr>
<tr>
<td>Hot axle box</td>
<td>An axle box and bearing that has exceeded its maximum designed operating temperature.</td>
</tr>
<tr>
<td>Incident</td>
<td>As defined in Article 3 of Directive 2004/49/EC.</td>
</tr>
<tr>
<td>Length of train</td>
<td>Total length of all vehicles over buffers including locomotive(s)</td>
</tr>
<tr>
<td><strong>Loop</strong></td>
<td>Track, connected to the main track, used for passing, crossing and stabling.</td>
</tr>
<tr>
<td>----------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Operating language</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Passenger</strong></td>
<td>Person (other than an employee with specific duties on the train) travelling by train or on railway property before or after a train journey.</td>
</tr>
<tr>
<td><strong>Performance monitoring</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Qualification</strong></td>
<td>The physical and psychological suitability for the task together with the required knowledge.</td>
</tr>
<tr>
<td><strong>Real time</strong></td>
<td>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 train’s journey as they occur.</td>
</tr>
<tr>
<td><strong>Reporting point</strong></td>
<td>A point on the train’s schedule where reporting of the arrival, departure or passing time is required.</td>
</tr>
<tr>
<td><strong>Route</strong></td>
<td>The particular section or sections of line</td>
</tr>
<tr>
<td><strong>Safety-critical task</strong></td>
<td>Task performed by staff when they control or affect the movement of a train, which could affect the health, and safety of persons.</td>
</tr>
<tr>
<td><strong>Scheduled stop</strong></td>
<td>Planned stop for commercial or operational reasons.</td>
</tr>
<tr>
<td><strong>Siding</strong></td>
<td>Any track(s) within an operational point which is used only for movement other than train movement.</td>
</tr>
<tr>
<td><strong>Signaller</strong></td>
<td>Performer in charge of the route setting of trains / shunting movements and of issuing instructions to drivers.</td>
</tr>
<tr>
<td><strong>Staff</strong></td>
<td>Employees working for a railway undertaking or an infrastructure manager, or their contractors, undertaking tasks as specified in this NTSN.</td>
</tr>
<tr>
<td><strong>Stop aspect</strong></td>
<td>Any signal aspect that does not allow the driver to pass the signal.</td>
</tr>
<tr>
<td><strong>Stopping point</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Timetable</strong></td>
<td>Document or system that gives details of a train(s) schedule over a particular route.</td>
</tr>
<tr>
<td><strong>Timing point</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Traction unit</strong></td>
<td>A powered vehicle able to move itself and other vehicles to which it may be coupled.</td>
</tr>
<tr>
<td><strong>Train</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Train despatch</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Train crew</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Train preparation</strong></td>
<td>Ensuring that a train is in a fit condition to enter service, that the train equipment is correctly deployed and that the formation of the train matches the train’s designated pathway. Train preparation also includes technical inspections carried out prior to the train entering service.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Abbreviation</strong></th>
<th><strong>Explanation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>Alternating current</td>
</tr>
<tr>
<td>CCS</td>
<td>Control-command and signalling</td>
</tr>
<tr>
<td>CEN</td>
<td>European Committee for Standardisation (Comité Européen de Normalisation)</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>COTIF</td>
<td>Convention Concerning International Carriage by Rail (Convention relative aux Transports Internationaux Ferroviaires)</td>
</tr>
<tr>
<td>dB</td>
<td>Decibels</td>
</tr>
<tr>
<td>DC</td>
<td>Direct current</td>
</tr>
<tr>
<td>DMI</td>
<td>Driver machine interface</td>
</tr>
<tr>
<td>ECG</td>
<td>Electrocardiogram</td>
</tr>
<tr>
<td>EIRENE</td>
<td>European Integrated Railway Radio Enhanced Network</td>
</tr>
<tr>
<td>EN</td>
<td>Euro-norm</td>
</tr>
<tr>
<td>ENE</td>
<td>Energy</td>
</tr>
<tr>
<td>ERA</td>
<td>European Railway Agency</td>
</tr>
<tr>
<td>ERTMS</td>
<td>European Rail Traffic Management System</td>
</tr>
<tr>
<td>ETCS</td>
<td>European Train Control System</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FRS</td>
<td>Functional Requirement Specification</td>
</tr>
<tr>
<td>GSM-R</td>
<td>Global System for Mobile Communications — Rail</td>
</tr>
<tr>
<td>HABD</td>
<td>Hot axle box detector</td>
</tr>
<tr>
<td>Hz</td>
<td>Hertz</td>
</tr>
<tr>
<td>IM</td>
<td>Infrastructure manager</td>
</tr>
<tr>
<td>INF</td>
<td>Infrastructure</td>
</tr>
<tr>
<td>OPE</td>
<td>Operation and traffic management</td>
</tr>
<tr>
<td>OSJD</td>
<td>Organisation for Co-operation of Railways</td>
</tr>
<tr>
<td>RST</td>
<td>Rolling stock</td>
</tr>
<tr>
<td>RU</td>
<td>Railway undertaking</td>
</tr>
<tr>
<td>SMS</td>
<td>Safety management system</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>SPAD</td>
<td>Signal passed at danger</td>
</tr>
<tr>
<td>SRS</td>
<td>System Requirement Specification</td>
</tr>
<tr>
<td>TAF</td>
<td>Telematic Applications for Freight</td>
</tr>
<tr>
<td>TEN</td>
<td>Trans-European Network</td>
</tr>
<tr>
<td>UIC</td>
<td>International Union of Railways (Union Internationale des Chemins de fer)</td>
</tr>
<tr>
<td>VKM</td>
<td>Vehicle keeper marking</td>
</tr>
</tbody>
</table>