**Dan id-dokument ġie magħmul bil-ħsieb li jintuża bħala għodda ta' dokumentazzjoni u l-istituzzjonijiet ma jassumu l-ebda responsabbiltà għall-kontenut tiegħu**

►**B**

# DEĊIŻJONI TAL-KUMMISSJONI

**tal-14 ta' Novembru 2012**

**dwar l-ispeċifikazzjoni teknika għall-interoperabbiltà relatata mas-subsistema ta' "l-operat u l-immaniġġjar tat-traffiku" tas-sistema ferrovjarja fl-Unjoni Ewropea u li temenda d-Deċiżjoni 2007/756/KE**

*(notifikata bid-dokument numru C(2012) 8075)*

**(Test b'relevanza għaż-ŻEE)**

(2012/757/UE)

(ĠU L 345, 15.12.2012, p. 1)

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| ►**M2** | Regolament tal-Kummissjoni (UE) 2015/995 tat-8 ta' Ġunju 2015 | L 165 | 1 | 30.6.2015 |

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►**C1** Emendi, Ġ.U. L 101, 4.4.2014, p. 15 (2012/757/UE)

▼B

# DEĊIŻJONI TAL-KUMMISSJONI

**tal-14 ta' Novembru 2012**

**dwar l-ispeċifikazzjoni teknika għall-interoperabbiltà relatata mas-subsistema ta' "l-operat u l-immaniġġjar tat-traffiku" tas-sistema ferrovjarja fl-Unjoni Ewropea u li temenda d-Deċiżjoni 2007/756/KE**

*(notifikata bid-dokument numru C(2012) 8075)*

**(Test b'relevanza għaż-ŻEE)**

(2012/757/UE)

IL-KUMMISSJONI EWROPEA,

Wara li kkunsidrat it-Trattat dwar il-Funzjonament tal-Unjoni Ewropea,

Wara li l-kkunsidrat id-Direttiva 2008/57/KE tal-Parlament Ewropew u tal-Kunsill tas-17 ta' Ġunju 2008 dwar l-interoperabbiltà tas-sistema ferrovjarja fil-Komunità [1], u b'mod partikolari, l-Artikolu 6(1) tagħha,

Billi:

(1) L-Artikolu 12 tar-Regolament (KE) Nru 881/2004 tal-Parlament Ewropew u tal-Kunsill tad-29 ta' April 2004 li jistabbilixxi Aġenzija Ewropea tal-Ferroviji [Aġenzija Ferrovjarja Ewropea] (Ir-Regolament tal-Aġenzija) [2] jeħtieġ li l-Aġenzija Ferrovjarja Ewropea (minn hawn 'il quddiem, "l-Aġenzija") għandha tiżgura illi l-ispeċifikazzjonijiet tekniċi għall-interoperabbiltà (minn hawn 'il quddiem, "TSIs") jiġu addattati għall-progress tekniku, ix-xejriet tas-suq u għall-ħtiġijiet soċjali u illi tipproponi lill-Kummissjoni l-emendi għat-TSIs li tikkunsidra meħtieġa.

(2) Bid-Deċiżjoni C(2010) 2576 tad-29 ta' April 2010, il-Kummissjoni tat mandat lill-Aġenzija biex tiżviluppa u tirrevedi l-ispeċifikazzjonijiet tekniċi għall-interoperabbiltà bil-għan li testendi l-ambitu tagħhom għas-sistema ferrovjarja kollha fl-Unjoni. Bit-termini ta' dak il-mandat, l-Aġenzija ntalbet tamalga u testendi l-ambitu tat-TSI tal-ferroviji ta' veloċità għolja u tat-TSI tas-sistema ferrovjarja konvenzjonali fir-rigward tas-subsistema ta' 'l-operat u l-immaniġġjar tat-traffiku'. Dawn it-TSIs ġew adottati permezz tad-Deċiżjoni tal-Kummissjoni 2008/231/KE [3] u d-Deċiżjoni tal-Kummissjoni 2011/314/UE [4] rispettivament.

(3) Fil-5 ta' Settembru 2011, l-Aġenzija ħarġet rakkomandazzjoni dwar l-inkorporazzjoni tat-TSI relatata mas-subsistema ta' 'l-operat u l-immaniġġjar tat-traffiku' tas-sistema ferrovjarja konvenzjonali u tat-TSI relatata mas-subsistema ta' 'l-operat u l-immaniġġjar tat-traffiku' tal-ferroviji ta' veloċità għolja, l-estensjoni tal-ambitu ġeografiku ta' dawn it-TSIs u t-trasferiment ta' dettalji tan-numru Ewropew tal-vettura (European vehicle number — EVN) għad-Deċiżjoni tal-Kummissjoni 2007/756/KE [5].

[1] ĠU L 191, 18.7.2008, p. 1.
[2] ĠU L 164, 30.4.2004, p. 1.
[3] ĠU L 84, 26.3.2008, p. 1.
[4] ĠU L 144, 31.5.2011, p. 1.
[5] ĠU L 305, 23.11.2007, p. 30.

▼B

(4) L-implimentazzjoni tat-TSI stipulata fl-Annes I, u ż-żamma ta' konformità mal-punti rilevanti ta' dik it-TSI, għandhom jiġu ddeterminati skont pjan ta' implimentazzjoni li kull Stat Membru irid iżomm aġġornat fir-rigward tal-linji li jkun responsabbli għalihom.

(5) Attwalment, it-traffiku ferrovjarju jopera skont ftehimiet eżistenti ta' natura nazzjonali, bilaterali, multinazzjonali jew internazzjonali. Huwa importanti li dawk il-ftehimiet ma jtellfux il-progress attwali u futur lejn l-interoperabbiltà. Għalhekk, għandha tiġi stabbilita proċedura ta' notifika ta' dawn il-ftehimiet mill-Istati Membri.

(6) Il-vetturi ferrovjarji jiġu rreġistrati minn korpi li jżommu r-reġistri nazzjonali tal-vetturi skont id-Deċiżjoni 2007/756/KE, abbażi tal-Artikolu 33 tad-Direttiva 2008/57/KE.

(7) Il-format tan-numru Ewropew tal-vettura u r-rekwiżit li dan ikun jidher miżbugħ fuq il-vettura huma t-tnejn neċessarji biex il-vettura tiġi identifikata, u għaldaqstant, għandhom jibqgħu fit-TSI relatata mas-subsistema ta' 'l-operat u l-immaniġġjar tat-traffiku'

(8) Biex ikun aktar faċli li wieħed jifhem ir-reġistru nazzjonali tal-vetturi u l-proċess tar-reġistrazzjoni tal-vetturi, huwa xieraq li d-dettalji tal-kodiċijiet tekniċi li huma parti min-numru Ewropew tal-vettura jiġu trasferiti għad-Deċiżjoni 2007/756/KE. Għalhekk id-Deċiżjoni 2007/756/KE għandha tiġi emendata skont dan.

(9) Permezz tal-Kumitat stabbilit skont l-Artikolu 29 tad-Direttiva 2008/57/KE, il-Kummissjoni għandha tinforma lill-Istati Membri dwar it-tibdil li jsir fil-listi tal-kodiċijiet ippubblikati mill-Aġenzija.

(10) Id-Direttiva 2008/57/KE tiddefinixxi s-subsistema ta' 'l-operat u l-immaniġġjar tat-traffiku' bħala subsistema funzjonali. Konsegwentement, it-TSI relata mas-subsistema ta' 'l-operat u l-immaniġġjar tat-traffiku' ma tiġix evalwata waqt l-awtorizzazzjoni ta' vettura biex tintuża fis-servizz iżda waqt li jiġu evalwati s-sistemi tal-immaniġġjar tas-sikurezza tal-impriżi ferrovjarji u tal-amministraturi tal-infrastruttura.

(11) Għal raġunijiet ta' ċareżża u sempliċità, ikun xieraq li d-dispożizzjonijiet tranżizzjonali stabbiliti fl-Artikoli 3, 5 u 7 tad-Deċiżjoni 2011/314/UE ma jiġux emendati.

(12) Id-Deċiżjonijiet 2008/231/KE u 2011/314/UE għandhom jiġu revokati.

(13) Il-miżuri stipulati f'din id-Deċiżjoni huma konformi mal-opinjoni tal-Kumitat stabbilit skont l-Artikolu 29(1) tad-Direttiva 2008/57/KE,

▼B

ADOTTAT DIN ID-DEĊIŻJONI:

▼M2

*Artikolu 1*

**Suġġett**

L-ispeċifikazzjoni teknika ta' interoperabbiltà (TSI) relatata mas-subsistema tal-"operat u l-immaniġġjar tat-traffiku" tas-sistema ferrovjarja fl-Unjoni Ewropea kollha, kif stabbilit fl-Anness I, hija b'dan adottata.

*Artikolu 2*

**Kamp ta' applikazzjoni**

1. It-TSI stabbilita fl-Anness I għandha tapplika għas-subsistema tal-"operat u l-immaniġġjar tat-traffiku" tas-sistema ferrovjarja fl-Unjoni kif definit fil-punt 2.5 tal-Anness II tad-Direttiva 2008/57/KE.

2. It-TSI għandha tapplika għan-netwerks li ġejjin:

(a) in-netwerk tas-sistema ferrovjarja trans-Ewropea konvenzjonali, kif iddefinit fit-Taqsima 1.1 tal-Anness I tad-Direttiva 2008/57/KE;

(b) in-netwerk ferrovjarju trans-Ewropew ta' veloċità kbira (TEN), kif iddefinit fit-Taqsima 2.1 tal-Anness I tad-Direttiva 2008/57/KE; u

(c) partijiet oħra tan-netwerk tas-sistema ferrovjarja fl-Unjoni.

Ma għandux ikopri l-każijiet imsemmija fl-Artikolu 1(3) tad-Direttiva 2008/57/KE.

*Artikolu 3*

**Punti miftuħa**

1. Għall-kwistjonijiet ikklassifikati bħala "punti miftuħa" msemmija fl-Appendiċi I tal-Anness I, il-kundizzjonijiet li għandhom jiġu ssodisfati għall-verifika tal-interoperabbiltà skont l-Artikolu 17(3) tad-Direttiva 2008/57/KE għandhom ikunu kif stabbilit fir-regoli nazzjonali li japplikaw fl-Istat Membru fejn isseħħ l-operazzjoni.

2. Sa mhux aktar tard mill-1 ta' Jannar 2016, kull Stat Membru għandu jinforma lill-Istati Membri l-oħra u lill-Kummissjoni dwar ir-regoli nazzjonali rilevanti tiegħu.

*Artikolu 3 a*

**Każijiet speċifiċi**

1. Fir-rigward tal-każijiet speċifiċi msemmija fil-punt 7.3 tal-Anness I, il-kundizzjonijiet li għandhom jiġu ssodisfati għall-verifika tal-interoperabbiltà skont l-Artikolu 17(3) tad-Direttiva 2008/57/KE għandhom ikunu kif stabbilit fir-regoli nazzjonali li japplikaw fl-Istat Membru fejn isseħħ l-operazzjoni.

2. Sa mhux aktar tard mill-1 ta' Jannar 2016, kull Stat Membru għandu jinforma lill-Istati Membri l-oħra u lill-Kummissjoni dwar ir-regoli nazzjonali rilevanti tiegħu.

▼M2

*Artikolu 3b*

**Notifika ta' ftehimiet bilaterali**

L-Istati Membri għandhom jinnotifikaw lill-Kummissjoni dwar it-tipi ta' ftehim li ġejjin sa mhux aktar tard mill-1 ta' Jannar 2016, sakemm ma jkunux għamlu dan skont id-Deċiżjoni tal-Kummissjoni 2006/920/KE ([1]), id-Deċiżjoni 2008/231/KE, id-Deċiżjoni 2011/314/UE jew din id-Deċiżjoni:

(a) ftehimiet nazzjonali bejn l-Istati Membri u l-impriżi ferrovjarji jew il-maniġers tal-infrastruttura, maqbula fuq bażi permanenti jew temporanja u meħtieġa minħabba n-natura speċifika ħafna jew lokali tas-servizz tat-trasport maħsub;

(b) ftehimiet bilaterali jew multilaterali bejn l-impriżi ferrovjarji, il-maniġers tal-infrastruttura jew l-awtoritajiet tas-sikurezza li jrendu livelli sinifikanti ta' interoperabbiltà lokali jew reġjonali; u

(c) ftehimiet internazzjonali bejn wieħed jew aktar mill-Istati Membri u talanqas pajjiż terz wieħed, jew bejn impriżi ferrovjarji jew amministraturi tal-infrastruttura tal-Istati Membri u talanqas impriża ferrovjarja waħda jew amministratur tal-infrastruttura wieħed ta' pajjiż terz, li jrendu livelli sinifikanti ta' interoperabbiltà lokali jew reġjonali.

*Artikolu 3c*

**Notifika ta' regoli relatati mat-tip ta' sinjal ta' wara**

L-Istati Membri għandhom jinnotifikaw lill-Kummissjoni dwar ir-regoli li jiddefinixxu t-tip ta' sinjal ta' wara, kif deskritt fil-punti 4.2.2.1.3.2 u 4.2.2.1.3.3 tal-Anness I, sa mhux aktar tard mill1 ta' Jannar 2016, sakemm ma jkunux diġà ġew innotifikati skont id-Deċiżjonijiet 2006/920/KE, 2008/231/KE, 2011/314/UE jew din id-Deċiżjoni.

*Artikolu 3d*

**L-implimentazzjoni**

1. Il-passi li għandhom jittieħdu għall-implimentazzjoni ta' subsistema tal-operazzjoni u l-immaniġġjar tat-traffiku interoperabbli, huma stabbiliti fit-Taqsima 7 tal-Anness I.

2. L-Istati Membri għandhom iħejju pjan ta' implimentazzjoni nazzjonali, u jiddeskrivu l-azzjonijiet li beħsiebhom jieħdu biex jikkonformaw ma' din id-Deċiżjoni, skont it-Taqsima 7 tal-Anness I.

L-Istati Membri għandhom jinnotifikaw lill-Kummissjoni bil-pjanijiet ta' implimentazzjoni nazzjonali tagħhom sa mhux aktar tard mill-1 ta' Lulju 2017. L-Istati Membri għandhom jinnotifikaw ukoll l-aġġornament possibbli ta' dawn il-pjanijiet ta' implimentazzjoni nazzjonali.

3. Il-Kummissjoni għandha tippubblika l-pjanijiet ta' implimentazzjoni nazzjonali, u kull reviżjoni sussegwenti nnotifikata, fuq is-sit tal-internet tagħha u tinforma lill-Istati Membri dwarhom permezz tal-Kumitat imsemmi fid-Direttiva 2008/57/KE.

([1]) Id-Deċiżjoni tal-Kummissjoni 2006/920/KE tal-11 ta' Awwissu 2006 dwar l-ispeċifikazzjoni teknika għall-interoperabbiltà relatata mas-subsistema 'L-Operat u l-Maniġment tat-Traffiku' tas-sistema ferrovjarja konvenzjonali trans-Ewropea (ĠU L 359, 18.12.2006, p. 1).

▼M2

4. L-Istati Membri li diġà bagħtu l-pjan ta' implimentazzjoni aġġornat tagħhom ma għandhomx għalfejn jerġgħu jibagħtuh.

▼B

*Artikolu 4*

Id-Deċiżjonijiet 2008/231/KE u 2011/314/KE huma b'dan revokati b'effett mill-1 ta' Jannar 2014.

*Artikolu 5*

Id-Deċiżjoni 2007/756/KE hija b'dan emendata kif ġej:

(a) L-Artikolu li ġej huwa inserit wara l-Artikolu 1:

*"Artikolu 1a*

L-Appendiċi 6 tal-Anness għal din id-Deċiżjoni għandu japplika mill-1 ta' Jannar 2014."

(b) L-Anness huwa emendat skont l-Anness II għal din id-Deċiżjoni.

*Artikolu 6*

1. L-Aġenzija għandha tippubblika, fuq is-sit elettroniku tagħha, il-listi tal-kodiċijiet imsemmija fil-partijiet 9, 10, 11, 12 u 13 tal-Appendiċi 6 tal-Anness għad-Deċiżjoni 2007/756/KE.

2. L-Aġenzija għandha żżomm il-listi tal-kodiċijiet imsemmija fil-paragrafu 1 aġġornati u għandha tinforma lill-Kummissjoni dwar kwalunkwe tibdil li jsir f'dawk il-kodiċijiet. Il-Kummissjoni għandha tinforma lill-Istati Membri dwar l-iżvilupp ta' dawn il-listi permezz tal-Kumitat stabbilit skont l-Artikolu 29 tad-Direttiva 2008/57/KE.

*Artikolu 7*

Din id-Deċiżjoni għandha tapplika mill-1 ta' Jannar 2014.

*Artikolu 8*

Din id-Deċiżjoni hija indirizzata lill-Istati Membri.

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*ANNESS I*

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| Appendix I: | List of open points |
| Appendix J: | Glossary |

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1. INTRODUCTION

1.1. **Technical scope**

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

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

1.2. **Geographical scope**

The geographical scope of this TSI is the network of the whole rail system composed of:

— the trans-European conventional rail system network (TEN) as described in Section 1.1 "Network" to Annex I of Directive 2008/57/EC,

— the trans-European high-speed rail system network (TEN) as described in Section 2.1 "Network" to Annex I of Directive 2008/57/EC,

— other parts of the network of the whole rail system, following the extension of scope as described in Section 4 to Annex I of Directive 2008/57/EC,

and excludes the cases referred to in Article 1(3) of Directive 2008/57/EC.

1.3. **Content of this TSI**

In accordance with Article 5(3) of Directive 2008/57/EC, this TSI:

(a) indicates its intended scope for the "operation and traffic management" subsystem — Chapter 2;

(b) lays down essential requirements for the subsystem concerned and its interfaces vis-à-vis other subsystems — Chapter 3;

(c) establishes the functional and technical specifications to be met by the target subsystem and its interfaces vis-à-vis other subsystems. If necessary, these specifications may vary according to the use of the subsystem, for example according to the categories of line, hub and/or rolling stock provided for in Annex I to Directive 2008/57/EC — Chapter 4;

(d) determines the interoperability constituents and interfaces covered by European specifications, including European standards, which are necessary to achieve interoperability within the European rail system — Chapter 5;

(e) states, in each case under consideration, which procedures are to be used in order to assess the conformity or suitability for use of the interoperability constituents — Chapter 6;

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(f) indicates the strategy for implementing the TSI. In particular, it is necessary to specify the stages to be completed and the elements that can be applied in order to make a gradual transition from the existing situation to the final situation in which compliance with the TSI must be the norm — Chapter 7;

(g) indicates, for the staff concerned, the professional qualifications and health and safety conditions at work required for the operation and maintenance of the subsystem concerned, as well as for the implementation of the TSI — Chapter 4.

Moreover, in accordance with Article 5(5) of Directive 2008/57/EC, provision may be made for specific cases for each TSI. These are indicated in Chapter 7.

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

2. DESCRIPTION OF SUBSYSTEM/SCOPE

2.1. **Subsystem**

The "operation and traffic management" subsystem is described in point 2.5 of Annex II to Directive 2008/57/EC 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 TSI applies to the "operation and traffic management" subsystem of infrastructure managers (hereinafter referred to as "IM") and railway undertakings (hereinafter referred to as "RU") related to the operation of trains on the European rail system as defined in Chapter 1.2.

2.2.1. *Staff and trains*

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

Point 4.6.2 applies to train drivers as provided for in point 8 of Annex VI to Directive 2007/59/EC.

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

For those staff undertaking the safety-critical tasks associated with the last preparation of a train before it is scheduled to cross a border(s) and work beyond any location(s) designated as the "frontier" in the network statement of an infrastructure manager and included in his safety authorisation, point 4.6 shall apply while mutual recognition between Member States shall apply for point 4.7. A train will not be considered to be a cross-border service, if all the vehicles of the train crossing the state border cross it only to the "frontier" location(s).

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2.2.2. *Principles*

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

RU and IM must 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 ([1]). The SMS itself is assessed by the relevant national safety authority (hereinafter referred to as "NSA") before granting safety certificate/authorisation.

2.2.3. *Applicability to existing vehicles and infrastructure*

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

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

3. ESSENTIAL REQUIREMENTS

3.1. **Compliance with the essential requirements**

In accordance with Article 4(1) of Directive 2008/57/EC, the Union rail system, its subsystems and their interoperability constituents must meet the essential requirements set out in general terms in Annex III to that Directive.

3.2. **Essential requirements — overview**

The essential requirements cover:

— safety,

— reliability and availability,

— health,

— environmental protection,

— technical compatibility,

— accessibility.

According to Directive 2008/57/EC, the essential requirements may be generally applicable to the whole European rail system or be specific to each subsystem and its constituents.

The following table summarises the correspondence between the essential requirements set out in Annex III to Directive 2008/57/EC and this TSI.

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

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| Clause | Clause title | Safety | | | | | Reliability & Availability | Health | | Environmental protection | | | | | Technical compatibility | Essential requirements specific to operation and traffic management | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.1.1 | 1.1.2 | 1.1.3 | 1.1.4 | 1.1.5 | 1.2 | 1.3.1 | 1.3.2 | 1.4.1 | 1.4.2 | 1.4.3 | 1.4.4 | 1.4.5 | 1.5 | 2.6.1 | 2.6.2 | 2.6.3 |
| 4.2.1.2 | Documentation for drivers | | | | | | X | | | | | | | | | X | | X |
| 4.2.1.2.1 | Rule Book | | | | | | | | | | | | X | | | X | | X |
| 4.2.1.2.2 | Route Book | | | | | | | | | | | | | | | X | | X |
| 4.2.1.2.2.1 | Preparation of the Route Book | | | | | | | | | | | | | | | X | | |
| 4.2.1.2.2.2 | Modification to information contained within the Route Book | | | | | | | | | | | | | | | X | | X |
| 4.2.1.2.2.3 | Informing the driver in real time | | | | | | | | | | | | | | | X | X | X |
| 4.2.1.2.3 | 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 |
| 4.2.1.4 | Documentation for infrastructure manager's staff authorising train movements | | | | | | X | | | | | | | | | X | X | |
| 4.2.1.5 | Safety-related communications between train crew, other railway undertaking staff and staff authorising train movements | | | | | | X | | | | | | | | | X | X | X |
| 4.2.2.1 | Train visibility | X | | | | | | | | | | | | | | X | | X |
| 4.2.2.1.1 | General requirement | X | | | | | | | | | | | | | | X | | X |
| 4.2.2.1.2 | Front end | X | | | | | | | | | | | | | | X | | X |
| 4.2.2.1.3 | Rear end | X | | | | | | | | | | | | | | X | | X |

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| Clause | Clause title | Safety | | | | | Reliability & Availability | Health | | Environmental protection | | | | | Technical compatibility | Essential requirements specific to operation and traffic management | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.1.1 | 1.1.2 | 1.1.3 | 1.1.4 | 1.1.5 | 1.2 | 1.3.1 | 1.3.2 | 1.4.1 | 1.4.2 | 1.4.3 | 1.4.4 | 1.4.5 | 1.5 | 2.6.1 | 2.6.2 | 2.6.3 |
| 4.2.2.2 | Train audibility | X | | | | | | | | | | | X | | | X | | X |
| 4.2.2.2.1 | General requirement | X | | | | | | | | | | | | | | X | | X |
| 4.2.2.2.2 | Control | X | | | | | | | | | | | | | | | | X |
| 4.2.2.3 | Vehicle identification | | | | | | X | | | | | | | | | X | | X |
| 4.2.2.4 | Safety of passengers and load | | | | | | | | | | | | | | | X | | |
| 4.2.2.5 | Train composition | | | | | | | | | | | | | | | X | | |
| 4.2.2.6 | Train braking | | X | | | | | | | | | | | | | X | | X |
| 4.2.2.6.1 | Minimum requirements of the braking system | | X | | | | | | | | | | | | | X | | X |
| 4.2.2.6.2 | Braking performance | | X | | | | | | | | | | | | | X | | X |
| 4.2.2.7 | Ensuring that the train is in running order | | X | | | | | | | | | | | | | X | | X |
| 4.2.2.7.1 | General requirement | | | | | | | | | | | | | | | X | | X |
| 4.2.2.7.2 | Data required | | | | | | | | | | | | | | | X | | X |
| 4.2.2.8 | Requirements for signal and line-side marker sighting | | | | | | | | | | | | | | X | X | | |
| 4.2.2.9 | Driver vigilance | | | | | | | | | | | | | | | X | | |

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| Clause | Clause title | Safety | | | | | Reliability & Availability | Health | | Environmental protection | | | | | Technical compatibility | Essential requirements specific to operation and traffic management | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.1.1 | 1.1.2 | 1.1.3 | 1.1.4 | 1.1.5 | 1.2 | 1.3.1 | 1.3.2 | 1.4.1 | 1.4.2 | 1.4.3 | 1.4.4 | 1.4.5 | 1.5 | 2.6.1 | 2.6.2 | 2.6.3 |
| 4.2.3.1 | Train planning | | X | | | | | | | | | | | | | | X | X |
| 4.2.3.2 | Identification of trains | | | | | | | | | | | | | | | X | X | X |
| 4.2.3.3 | Train departure | | | | | | | | | | | | | | | X | | X |
| 4.2.3.3.1 | Checks and tests before departure | | X | | | | X | | | | | | | | | X | | X |
| 4.2.3.3.2 | Informing the infrastructure manager of the train's operational status | | X | | | | X | | | | | | | | | | X | X |
| 4.2.3.4 | Traffic management | | | | | | | | | | | | | | | X | X | X |
| 4.2.3.4.1 | General requirements | | | | | | | | | | | | | | | X | X | X |
| 4.2.3.4.2 | Train reporting | | | | | | | | | | | | | | | X | X | X |
| 4.2.3.4.2.1 | Data required for train position reporting | | | | | | | | | | | | | | | X | | X |
| 4.2.3.4.2.2 | Predicted handover time | | | | | | | | | | | | | | | X | | X |
| 4.2.3.4.3 | Dangerous goods | | | | | | | | | | | | | | | X | X | |
| 4.2.3.4.4 | Operational quality | | | | | | | | | | | | | | | | X | X |
| 4.2.3.5 | Data recording | | | | | | X | | | | | | | | | | X | |

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| Clause | Clause title | Safety | | | | | Reliability & Availability | Health | | Environmental protection | | | | | Technical compatibility | Essential requirements specific to operation and traffic management | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.1.1 | 1.1.2 | 1.1.3 | 1.1.4 | 1.1.5 | 1.2 | 1.3.1 | 1.3.2 | 1.4.1 | 1.4.2 | 1.4.3 | 1.4.4 | 1.4.5 | 1.5 | 2.6.1 | 2.6.2 | 2.6.3 |
| 4.2.3.5.1 | Recording of supervision data outside the train | | | | | | X | | | | | | | | | | X | |
| 4.2.3.5.2 | Recording of supervision data on board the train | | | | | | X | | | | | | | | | | X | |
| 4.2.3.6 | Degraded operation | | | | | | | | | | | | | | | X | X | X |
| 4.2.3.6.1 | Advice to other users | | | | | | | | | | | | | | | X | | X |
| 4.2.3.6.2 | Advice to train drivers | | | | | | | | | | | | | | | X | | |
| 4.2.3.6.3 | Contingency arrangements | | | | | | | | | | | | | | | X | X | X |
| 4.2.3.7 | Managing an emergency situation | | | | | | | | | | | | | | | X | X | X |
| 4.2.3.8 | Aid to train crew in the event of an incident or of a major rolling stock malfunction | | | | | | | | | | | | | | | | | X |
| 4.4 | ERTMS operating rules | | | | | | | | | | | | | | | X | X | |
| 4.6 | Professional qualifications | | | | | | | | | | | | | | | X | X | X |
| 4.7 | Health and safety conditions | | | | | | | | | | | | | | | X | | |

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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 ([1]), 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 TSI sets out requirements on:

— qualifications (see point 4.6 and Appendix G),

— health and safety conditions (see point 4.7).

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

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4.2.1.2. 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:

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— 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:

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— names of stations on the line and key locations and their location,

— tunnels, including location, name, length, specific information such as the existence of walkways and points of safe egress as well as the location of safe areas where evacuation of passengers can take place,

— essential locations such as neutral sections,

— permissible speed limits for each track, including, if necessary, differential speeds relating to certain types of train,

— the responsible infrastructure manager,

— means of communication with the traffic management/control centre in normal and degraded mode.

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

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

4.2.1.2.2.2 Modifications to information contained within the Route Book

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

These changes 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.

4.2.1.2.2.3 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 4.2.1.2.2.2.

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,

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— 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.

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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

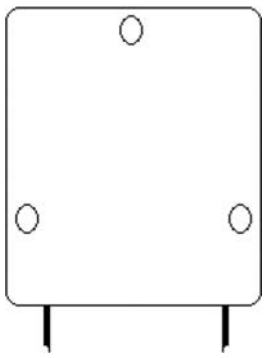
4.2.2.1.1 General requirement

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.

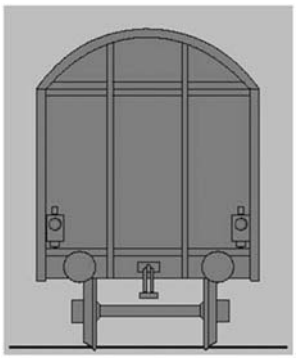
The spacing, the height above rails, the diameter, the intensity of the lights, the dimensions and shape of the emitted beam in both day and night time operation are defined in Commission Regulation (EU) No 1302/2014 (the "rolling stock — locomotives and passenger rolling stock" TSI (LOC&PAS TSI)) [1].

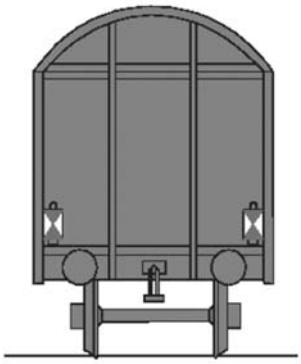
4.2.2.1.3 Rear end

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.

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

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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.

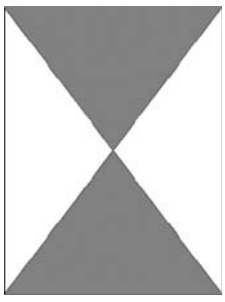
4.2.2.1.3.2 Freight trains in international traffic

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

either

— two steady red lights, or

— two reflective plates of the following shape with white side triangles and red top and bottom triangle:



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

Member States that require two reflective plates must also accept two steady red lights as train rear-end indication.

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

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

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

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4.2.2.1.3.3 Freight trains not crossing a border between Member States

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

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

4.2.2.2. Train audibility

4.2.2.2.1 General requirement

The railway undertaking 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

— 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;

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(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 TSI.

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.

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(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 date of entry into force of the present regulation shall also be made available.

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

— the relevant line characteristics as expressed in point (1) above 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.

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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 TSIs.

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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 Commission Decision 2012/88/EU [1], as amended (the control-command and signalling TSI (hereinafter referred to as "CCS TSI").

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.

[1] Commission Decision 2012/88/EU of 25 January 2012 on the technical specification for interoperability relating to the control-command and signalling subsystems of the trans-European rail system (OJ L 51, 23.2.2012, p. 1).

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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 [1],

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

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— 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.

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

The data must be securely sealed and stored and accessible to authorised bodies including National Investigation Bodies 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 TSI Loc & Pas.

4.2.3.6. Degraded operation

4.2.3.6.1 Advice to other users

The infrastructure manager in conjunction with the railway undertaking(s) 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.

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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,

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— 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 TSI*

| Reference operation TSI | | Reference infrastructure TSI | |
|---|---|---|---|
| Parameter | Point | Parameter | Point |
| Braking performance and maximum speed allowed | 4.2.2.6.2 | Longitudinal track resistance | 4.2.6.2 |
| Modifications to information contained in the Route Book | 4.2.1.2.2.2 | Operating rules | 4.4 |
| Degraded operation | 4.2.3.6 | | |

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

| Reference operation TSI | | Reference control-command and signalling TSI | |
|---|---|---|---|
| Parameter | Point | Parameter | Point |
| Rule Book | 4.2.1.2.1 | Operating rules | 4.4 |
| Operating rules | 4.4 | | |
| Requirements for line-side signal and marker sighting | 4.2.2.8 | Visibility of track-side control-command objects | 4.2.15 |
| Train braking | 4.2.2.6 | Train braking performance and characteristics | 4.3.2.3 |
| Rule Book | 4.2.1.2.1 | Use of sanding equipment | 4.2.10 |

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| Reference operation TSI | | Reference control-command and signalling TSI | |
|---|---|---|---|
| Parameter | Point | Parameter | Point |
| Train running number | 4.2.3.2.1 | ETCS DMI | 4.2.12 |
| | | GSM-R DMI | 4.2.13 |
| Data recording on board | 4.2.3.5 | Interface to data recording for regulatory purposes | 4.2.14 |

4.3.3. *Interfaces with the rolling stock TSIs*

4.3.3.1. Interfaces with TSI on locomotives and passenger rolling stock

| Reference operation TSI | | Reference LOC&PAS TSI | |
|---|---|---|---|
| Parameter | Point | Parameter | Point |
| Contingency arrangements | 4.2.3.6.3 | Rescue coupling | 4.2.2.2.4 |
| | | End coupling | 4.2.2.2.3 |
| Train composition | 4.2.2.5 | Axle load parameter | 4.2.3.2 |
| Train braking | 4.2.2.6 | Braking performance | 4.2.4.5 |
| Train visibility | 4.2.2.1 | External front and rear lights | 4.2.7.1 |
| Train audibility | 4.2.2.2 | Horn | 4.2.7.2 |
| Requirements for line-side signal and marker sighting | 4.2.2.8 | External visibility | 4.2.9.1.3 |
| | | Optical characteristics of the windscreen | 4.2.9.2.2 |
| | | Internal lighting | 4.2.9.1.8 |
| Driver vigilance | 4.2.2.9 | Driver's activity control function | 4.2.9.3.1 |
| Recording of supervision data on board the train | 4.2.3.5.2 | Recording device | 4.2.9.6 |
| Managing an emergency situation | 4.2.3.7 | Lifting diagram and instructions | 4.2.12.5 |
| | | Rescue-related descriptions | 4.2.12.6 |
| Train composition | 4.2.2.5 | Operating documentation | 4.2.12.4 |
| Minimum elements relevant to professional qualification for the tasks associated with "accompanying trains" | Appendix F | | |

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| Reference operation TSI | | Reference LOC&PAS TSI | |
|---|---|---|---|
| Parameter | Point | Parameter | Point |
| Sanding | Appendix B | Isolating emissions | 4.2.3.3.1.1 |

4.3.3.2. Interfaces with TSI on freight wagons

| Reference operation TSI | | Reference freight wagon TSI | |
|---|---|---|---|
| Parameter | Point | Parameter | Point |
| Rear end | 4.2.2.1.3.2 | Attachment devices for rear-end signal | 4.2.6.3 |
| | | Rear-end signal | Appendix E |
| Train composition | 4.2.2.5 | Gauging | 4.2.3.1 |
| Train composition | 4.2.2.5 | Compatibility with load-carrying capacity of lines | 4.2.3.2 |
| Contingency arrangements | 4.2.3.6.3 | Strength of unit — Lifting and jacking | 4.2.2.2 |
| Train braking | 4.2.2.6 | Brake | 4.2.4 |

4.3.4. *Interfaces with the Energy TSI*

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

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4.3.5. *Interfaces with TSI on Safety in Railway Tunnels*

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

4.4. **Operating rules**

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

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

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

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.

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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 ([1]) and (EU) 1169/2010 ([2]).

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.

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

([2]) Commission Regulation (EU) No 1169/2010 of 10 December 2010 on a common safety method for assessing conformity with the requirements for obtaining a railway safety authorisation (OJ L 327, 11.12.2010, p. 13).

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

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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 Member State — a psychologist or a medical doctor.

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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:

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

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

4.8.1. *Infrastructure*

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

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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 Article 2(f) of Directive 2008/57/EC, "interoperability constituents" means "any elementary component, group of components, subassembly or complete assembly of equipment incorporated or intended to be incorporated into a subsystem, upon which the interoperability of the rail system depends directly or indirectly. 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 TSI does not yet specify any interoperability constituents, no assessment arrangements are discussed.

6.2. **Operation and traffic management subsystem**

6.2.1. *Principles*

The operation and traffic management subsystem is a functional subsystem according to Annex II to Directive 2008/57/EC.

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 TSI within their safety management system when applying for any new or amended safety certificate or safety authorisation.

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

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

7. IMPLEMENTATION

7.1. **Principles**

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

This plan must take into account:

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(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.

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

7.2. **Implementation guidelines**

There are three distinct elements to implementation:

(a) confirmation that any existing systems and processes comply with the requirements of this TSI;

(b) adaptation of any existing systems and processes to comply with the requirements of this TSI;

(c) new systems and processes arising from implementation of other subsystems

— new/upgraded conventional lines (infrastructure/energy),

— new or upgraded ETCS signalling installations, GSM-R radio installations, hot axle box detectors, etc. (control-command and signalling),

— new rolling stock (rolling stock)

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7.3. **Specific cases**

7.3.1. *Introduction*

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

These specific cases belong to two categories:

(a) the provisions apply either permanently (case “P”), or temporarily (case “T”);

(b) in temporary cases Member States shall conform with the relevant subsystem either by **2030** (case “T1”, by 2024 (case “T2”) or by 2018 (case “T3”).

7.3.2. *List of specific cases*

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

For the implementation of point 4.2.2.1.3.2 and 4.2.2.1.3.3, trains which are operated solely on the 1 520 mm gauge network of Estonia, Latvia and Lithuania may use another specified train rear-end signal.

7.3.2.2. Temporary specific case (T2) Ireland and United Kingdom

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

7.3.2.3. Temporary specific case (T3) Finland

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

7.3.2.4. Permanent specific case (P1) Finland

For the implementation of point 4.2.2.1.3.3 and the implementation of common operational rule 5 of Appendix B, Finland is not using any rear-end signal device for freight trains. The means to indicate the train rear-end signal for freight trains as stated in point 4.2.2.1.3.2 are also accepted in Finland.

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*Appendix A*

**ERTMS/ETCS operating rules**

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

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*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.

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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.

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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.

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(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.

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*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 ….....<br>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:

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4.2 The International Phonetic Alphabet shall be used:

— to identify letters of the alphabet,

— to spell words and location names that are difficult to say, or may be misunderstood,

— in case of interference on the radio or phone,

— when quoting the identity of signals or points.

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

4.3 The numbers shall be spoken digit by digit:

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

5. TERMS (GENERAL)

Standard terminology to be used in the communication procedure

5.1 Speech transmission procedure

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

| |
|---|
| over |

5.2 Message receiving procedure

5.2.1 Upon receiving a direct message

Term confirming that the sent message has been received:

| |
|---|
| received |

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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.

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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:

| |
|---|
| cancel procedure ….... |

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

Error during transmission

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

| |
|---|
| error (+ prepare new form …) ..... |

or:

| |
|---|
| error + I say again |

and then send the initial message again.

Error during read-back

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

| |
|---|
| error + I say again |

and send the initial message again.

Misunderstanding

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

| |
|---|
| say again (+ speak slowly) |

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.

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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.

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*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**

| Number | Title | Route Book | Train compatibility over route intended for operation |
|---|---|---|---|
| 1 | **Generic information regarding the IM** | | |
| 1.1 | IM's Name | **X** | **X** |
| 1.2 | Member State | | **X** |
| 2 | **Maps and diagrams** | | |
| 2.1 | **Map: schematic overview including** | | |
| 2.1.1 | Line sections | **X** | |
| 2.1.2 | Principal locations (stations, yards, junctions, freight terminals) | **X** | |
| 2.2 | **Line diagram** | | |
| *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* | | | |
| 2.3.1 | Name of location | **X** | **X** |
| 2.3.2 | Type of location passenger terminal, freight terminal, yard, depot | **X** | |
| 2.3.3 | Location, type and identification of fixed signals that protect danger points | **X** | |
| 2.3.4 | Identification and plan of tracks, including switches | **X** | |
| 2.3.5 | Identification of platforms | **X** | **X** |
| 2.3.6 | Length of platforms | **X** | **X** |
| 2.3.7 | Height of platforms | **X** | **X** |
| 2.3.8 | Identification of loops | **X** | **X** |
| 2.3.9 | Length of loops | | **X** |

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| Number | Title | Route Book | Train compatibility over route intended for operation |
|---|---|---|---|
| 3 | **Specific line segment information** | | |
| 3.1 | **General characteristics** | | |
| 3.1.1 | Line segment extremity 1 | **X** | **X** |
| 3.1.2 | Line segment extremity 2 | **X** | **X** |
| 3.1.3 | Line-side indications of distance (frequency, appearance and positioning) | **X** | |
| 3.1.4 | Maximum permissible speed(s)/Speeds according to allocated path timetable | **X** | **X** |
| 3.1.5 | Any other information the driver shall be aware of | **X** | |
| 3.1.6 | Specific geographical information required on the local infrastructure | **X** | |
| 3.1.7 | Special restrictions for dangerous goods | | **X** |
| 3.1.8 | Special loading restrictions | | **X** |
| 3.1.9 | Means of communication with the traffic management/control centre in normal, degraded and emergency situation | **X** | |
| 3.2 | **Specific technical characteristics** | | |
| 3.2.1 | Track gauge | | **X** |
| 3.2.2 | Structure gauge | | **X** |
| 3.2.3 | Maximum axle load | | **X** |
| 3.2.4 | Maximum load per linear meter | | **X** |
| 3.2.5 | Maximum cant deficiency | | **X** |
| 3.2.6 | Minimum radius of curvature | | **X** |
| 3.2.7 | Gradient percentage | **X** | **X** |
| 3.2.8 | Gradient location | **X** | **X** |
| 3.2.9 | Braking performance related information | | **X** |
| 3.2.10 | For brake system that does not use wheel-rail adhesion, accepted braking effort | | **X** |
| 3.2.11 | Tunnels: fire safety categorisation and tunnel-related data in clause 4.2.1.2.2.1c | **X** | **X** |
| 3.2.12 | Non-stopping areas: identification, location, type | **X** | |
| 3.2.13 | Industrial risks — locations where it is dangerous for the driver to step out | **X** | |

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| Number | Title | Route Book | Train compatibility over route intended for operation |
|---|---|---|---|
| 3.2.14 | Locations of areas designated for testing the sanding device (if existing) | **X** | |
| 3.3 | **Energy subsystem** | | |
| 3.3.1 | Energy supply system (voltage and frequency) | **X** | **X** |
| 3.3.2 | Maximum train current | **X** | **X** |
| 3.3.3 | Restriction related to power consumption of specific electric traction unit(s) | **X** | |
| 3.3.4 | Restriction related to the position of Multiple Traction unit(s) to comply with contact line separation (position of pantograph) | **X** | |
| 3.3.5 | Location of neutral sections | **X** | |
| 3.3.6 | Location of areas that must be passed with lowered pantographs. | **X** | |
| 3.3.7 | Conditions applying with regard to regenerative braking | **X** | **X** |
| 3.3.8 | Maximum current at standstill per pantograph | **X** | **X** |
| 3.3.9 | Requirements for number of raised pantographs and spacing between them | | **X** |
| 3.3.10 | Contact wire height | | **X** |
| 3.3.11 | Characteristics of pantograph accepted | | **X** |
| 3.3.12 | Mean contact force permitted | | **X** |
| 3.4 | **Control-command and signalling subsystem** | | |
| 3.4.1 | Need for more than one system active simultaneously | **X** | |
| *ERTMS/ETCS* | | | |
| 3.4.2 | Level of application | | **X** |
| 3.4.3 | Optional functions required on board: infill | | **X** |
| 3.4.4 | Software version number | | **X** |
| *ERTMS/GSM-R radio* | | | |
| 3.4.5 | Version number | | **X** |
| *Class B signalling systems* | | | |
| 3.4.6 | System name | | **X** |
| 3.4.7 | Software version number | | **X** |

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| Number | Title | Route Book | Train compatibility over route intended for operation |
|---|---|---|---|
| *Class B radio systems* | | | |
| 3.4.8 | System name | | **X** |
| 3.4.9 | Software version number | | **X** |
| *Speed restrictions related to braking performance* | | | |
| 3.4.10 | Class B train protection, control and warning systems | | **X** |
| *Switch-overs* | | | |
| 3.4.11 | Special conditions to switch over between different class B train protection, control and warning systems | **X** | |
| 3.4.12 | Special technical conditions required to switch over between ERTMS/ETCS and Class B systems | **X** | |
| 3.4.13 | Special instructions (location) to switch over between different radio systems | **X** | |
| *EMC Susceptibility of infrastructure-side control-command and signalling* | | | |
| 3.4.14 | Permissibility to use eddy-current brake | **X** | **X** |
| 3.4.15 | Permissibility to use magnetic brake | **X** | **X** |
| 3.5 | **Operation and traffic management subsystem** | | |
| 3.5.1 | Operating language | **X** | |
| 3.5.2 | Special climatic conditions and associated arrangements, if any | | **X** |

▼M2

*Appendix E*

**Language and communication level**

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

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

▼M2

*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 TSI, refers to those elements that are important to ensure that operational staff are trained and able to understand and discharge the tasks.

(c) Rules and procedures apply to the tasks being performed and to the person carrying out the tasks. These tasks may be carried out by any authorised qualified person irrespective of any name, job title or grade used in rules or procedures or by the individual company.

2. PROFESSIONAL KNOWLEDGE

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

2.1. **General professional knowledge**

(a) Principles of organisation's safety management system, relevant to the tasks.

(b) Roles and responsibilities of the key players involved in operations.

(c) General conditions relevant to the safety of passengers or cargo and persons on or about the railway track.

(d) Conditions of health and safety at work.

(e) General principles of security of the railway system.

(f) Personal safety including when leaving the train on the running line.

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

(a) Operational procedures and safety rules.

(b) Relevant aspects of control command and signalling system.

(c) Formalised messaging procedure including use of communication equipment.

2.3. **Knowledge of rolling stock**

(a) Passenger vehicle interior equipment.

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

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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.

▼M2

(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.

▼M2

*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 TSI, refers to those elements that are important to ensure that operational staff are trained and able to understand and discharge the elements of the task.

(c) Rules and procedures apply to the task being performed and to the person carrying out the task. These tasks may be carried out by any authorised qualified person irrespective of any name, job title or grade used in rules or procedures or by the individual company.

2. PROFESSIONAL KNOWLEDGE

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

2.1. **General professional knowledge**

(a) Principles of organisation's safety management system, relevant to the task.

(b) Roles and responsibilities of the key players involved in operations.

(c) General conditions relevant to the safety of passengers and/or cargo including the carriage of dangerous goods and exceptional loads.

(d) Appreciation of hazards, especially in relation to the risks involving railway operation and electric traction supply.

(e) Conditions of health and safety at work.

(f) General principles of security of the railway system.

(g) Personal safety when on or in the vicinity of rail lines.

(h) Communications principles and formalised messaging procedure including use of communication equipment.

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

(a) Working of trains in normal, degraded and emergency situations.

(b) Operational procedures at individual locations (signalling, station/depot/yard equipment) and safety rules.

(c) Local operating arrangements.

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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).

▼M2

*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 ([1]), Appendix 6.

The European Vehicle Number shall be changed when it does not reflect the interoperability capability or technical characteristics according to this Appendix due to technical modifications of the vehicle. Such technical modifications may require a new placing in service according to Articles 20 to 25 of Directive 2008/57/EC.

2. GENERAL ARRANGEMENTS FOR EXTERNAL MARKINGS

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

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

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

3. WAGONS

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

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

Where in the examples:

D and NL stand for the registering Member State as set out in NVR-decision 2007/756/EC, Appendix 6, part 4.

RFC, DB and ACTS stand for the keeper marking as set out in NVR-decision 2007/756/EC, Appendix 6, part 1.

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

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

([1]) Commission Decision 2007/756/EC of 9 November 2007 adopting a common specification of the national vehicle register provided for under Articles 14(4) and (5) of Directives 96/48/EC and 2001/16/EC (OJ L 305, 23.11.2007, p. 30).

▼M2

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:

01 87 3320 644-7

TEN F-SNCF Ks-xy

4. COACHES AND HAULED PASSENGER STOCK

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

| | |
|---|---|
| F-SNCF | 61 87 20 - 72 021 - 7<br>$B^{10}$ tu |

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

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

5. LOCOMOTIVES, POWER CARS AND SPECIAL VEHICLES

The European Vehicle Number 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.

6. ALPHABETICAL MARKING OF THE INTEROPERABILITY CAPABILITY

"TEN": Vehicle which:

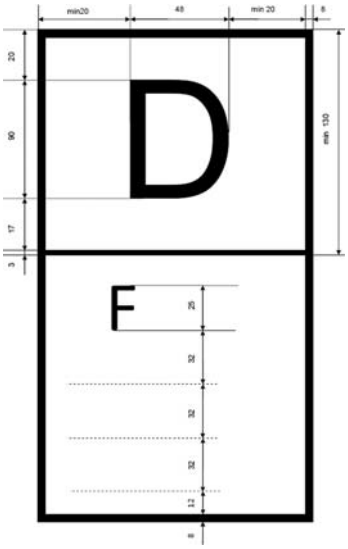
(a) complies with all relevant TSIs which are in force at the moment of placing in service and has been authorised to be placed in service in accordance with Article 22(1) of Directive 2008/57/EC; and

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

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

Vehicles which are not authorised to be placed in service in all Member States in accordance with Article 23(1) of Directive 2008/57/EC need a marking indicating the Member States where the vehicle is authorised to be placed in service. This marking shall be according to one of the following drawings, where D stands for the Member State who has granted the first authorisation (in the given example, Germany) and F stands for the second authorising MS (in the given example, France). The MS are codified in accordance with Decision 2007/756/EC, Appendix 6, part 4.

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*Appendix I*

**List of open points**

**Appendix B (see point 4.4)**

Common operational principles and rules

▼M2

*Appendix J*

**Glossary**

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

| Term | Definition |
|---|---|
| Accident | As defined in Article 3 of Directive 2004/49/EC. |
| Authorising train movements | The operation of equipment in signalling centres, electric traction current supply control rooms and traffic control centres that permits train movement. This does not include those staff employed by a railway undertaking who are responsible for management of resources such as train crew or rolling stock. |
| Competence | The qualification and experience necessary to safely and reliably undertake the task being performed. Experience can be gained as part of the training process. |
| Dangerous goods | As covered by Directive 2008/68/EC on the inland transport of dangerous goods |
| Degraded operation | Operation resulting from an unplanned event that prevents the normal delivery of train services. |
| Despatch (= dispatch) | See Train despatch |
| Driver | As defined in Article 3 of Directive 2007/59/EC. |
| Emergency call | Call set up in some dangerous situations to warn all trains/shunting movements in a defined area. |
| Exceptional loads | A load carried on a rail vehicle, for example a container, swap body or other traffic where the rail vehicle size and/or axle loading requires special authority for the movement and/or the application of special conditions of travel for all or part of the journey. |
| Health and safety conditions | In the context of this TSI, this refers only to the medical and psychological qualifications required to operate the relevant elements of the subsystem. |
| Hot axle box | An axle box and bearing that has exceeded its maximum designed operating temperature. |
| Incident | As defined in Article 3 of Directive 2004/49/EC. |
| Length of train | Total length of all vehicles over buffers including locomotive(s) |
| Loop | Track, connected to the main track, used for passing, crossing and stabling. |
| Operating language | The language or languages used in daily operation an infrastructure manager and published in his Network Statement, for the communication of operational or safety- related messages between the staff of the infrastructure manager and the railway undertaking. |
| Passenger | Person (other than an employee with specific duties on the train) travelling by train or on railway property before or after a train journey. |
| Performance monitoring | The systematic observation and recording of the performance of the train service and the infrastructure for the purpose of bringing about improvements in the performance of both. |

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| Term | Definition |
|---|---|
| Qualification | The physical and psychological suitability for the task together with the required knowledge. |
| Real time | The ability to exchange or process information on specified events (such as arrival at a station, passing a station or departure from a station) on the train's journey as they occur. |
| Reporting point | A point on the train's schedule where reporting of the arrival, departure or passing time is required. |
| Route | The particular section or sections of line |
| Safety-critical task | Task performed by staff when they control or affect the movement of a train, which could affect the health, and safety of persons. |
| Scheduled stop | Planned stop for commercial or operational reasons. |
| Siding | Any track(s) within an operational point which is used only for movement other than train movement. |
| Signaller | Performer in charge of the route setting of trains / shunting movements and of issuing instructions to drivers. |
| Staff | Employees working for a railway undertaking or an infrastructure manager, or their contractors, undertaking tasks as specified in this TSI. |
| Stop aspect | Any signal aspect that does not allow the driver to pass the signal. |
| Stopping point | A location identified in the schedule of a train where the train is planned to stop, usually to carry out a specific activity such as allowing passengers to join and leave the train. |
| Timetable | Document or system that gives details of a train(s) schedule over a particular route. |
| Timing point | A location identified in the schedule of a train where a specific time is identified. This time may be an arrival time, departure time or in the case of a train not scheduled to stop at that location the passing time. |
| Traction unit | A powered vehicle able to move itself and other vehicles to which it may be coupled. |
| Train | A train is defined as (a) traction unit(s) with or without coupled railway vehicles with train data available operating between two or more defined points. |
| Train despatch | The indication to the person driving the train that all station or depot activities are completed and that, as far as the staff responsible are concerned, movement authority has been granted for the train. |
| Train crew | Members of the on-board staff of a train, who are certified as competent and appointed by a railway undertaking to carry out specific, designated safety-related tasks on the train, for example the driver or the guard. |
| Train preparation | Ensuring that a train is in a fit condition to enter service, that the train equipment is correctly deployed and 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. |

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| Abbreviation | Explanation |
|---|---|
| AC | Alternating current |
| CCS | Control-command and signalling |
| CEN | European Committee for Standardisation (Comité Européen de Normalisation) |
| COTIF | Convention Concerning International Carriage by Rail (Convention relative aux Transports Internationaux Ferroviaires) |
| dB | Decibels |
| DC | Direct current |
| DMI | Driver machine interface |
| EC | European Community |
| ECG | Electrocardiogram |
| EIRENE | European Integrated Railway Radio Enhanced Network |
| EN | Euro-norm |
| ENE | Energy |
| ERA | European Railway Agency |
| ERTMS | European Rail Traffic Management System |
| ETCS | European Train Control System |
| EU | European Union |
| FRS | Functional Requirement Specification |
| GSM-R | Global System for Mobile Communications — Rail |
| HABD | Hot axle box detector |
| Hz | Hertz |
| IM | Infrastructure manager |
| INF | Infrastructure |
| OPE | Operation and traffic management |
| OSJD | Organisation for Co-operation of Railways |
| PPV / PPW | Russian abbreviation for Prawila Polzowaniia Wagonami w mejdunarodnom soobqenii = Rules for use of railway vehicles in international traffic |
| RST | Rolling stock |
| RU | Railway undertaking |
| SMS | Safety management system |

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| Abbreviation | Explanation |
|---|---|
| SPAD | Signal passed at danger |
| SRS | System Requirement Specification |
| TAF | Telematic Applications for Freight |
| TEN | Trans-European Network |
| TSI | Technical Specification for Interoperability |
| UIC | International Union of Railways (Union Internationale des Chemins de fer) |
| VKM | Vehicle keeper marking |

▼B

*ANNEX II*

The Annex to Decision 2007/756/EC is amended as follows:

(1) Chapter 1 is amended as follows:

(a) The description of the data field 1. 'European Vehicle Number' is replaced by the following:

'numeric identification code as defined in Appendix 6';

(b) Footnote (1) is replaced by the following:

'([1]) not used'.

(c) The description of the data field 2.1 is replaced by the following:

'Member State numeric code as defined in Appendix 6, part 4'.

(d) The description of the data field 11 is replaced by the following:

'Member State numeric code as defined in Appendix 6, part 4'.

(2) In Chapter 2.1, Links with other registers, the explanation regarding VKMR is replaced by the following:

'VKMR: this register is managed by ERA and OTIF in cooperation (ERA for the EU and OTIF for all non-EU OTIF Member States). The keeper is recorded in the NVR. Appendix 6 specifies other global central registers (such as vehicle type codes, interoperability codes, country codes, etc.) to be managed by a "central body" resulting from cooperation between ERA and OTIF'.

(3) The following Appendix is added:

'*Appendix 6*

**PART '0' — VEHICLE IDENTIFICATION**

**General remarks**

This appendix describes the European Vehicle Number and linked marking applied in a visible manner on the vehicle to identify it uniquely and in a permanent manner during operation. It does not describe other numbers or markings eventually engraved or fixed in a permanent manner on the chassis or the main components of the vehicle during its construction.

**European Vehicle number and linked abbreviations**

Each railway vehicle receives a number consisting of 12 figures (called European Vehicle Number (EVN)) with the following structure:

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| Rolling stock group | Interoperability capability and vehicle type [2 figures] | Country in which the vehicle is registered [2 figures] | Technical characteristics [4 figures] | Serial number [3 figures] | Check digit [1 figure] |
|---|---|---|---|---|---|
| Wagons | 00 to 09<br>10 to 19<br>20 to 29<br>30 to 39<br>40 to 49<br>80 to 89<br>*[details in part 6]* | 01 to 99<br>*[details in part 4]* | 0000 to 9999<br>*[details in part 9]* | 000 to 999 | 0 to 9<br>*[details in part 3]* |
| Hauled passenger vehicles | 50 to 59<br>60 to 69<br>70 to 79<br>*[details in part 7]* | | 0000 to 9999<br>*[details in part 10]* | 000 to 999 | |
| Tractive rolling stock and units in a train set in fixed or pre-defined formation | 90 to 99<br>*[details in part 8]* | | 0000000 to 8999999<br>*[the meaning of these figures is defined by the Member States, eventually by bilateral or multilateral agreement]* | | |
| Special vehicles | | | 9000 to 9999<br>*[details in part 11]* | 000 to 999 | |

In a given country, the 7 digits of technical characteristics and serial number are sufficient to identify uniquely a vehicle inside the groups of hauled passenger vehicles and special vehicles ([1]).

Alphabetical markings complete the number:

(a) abbreviation of the country in which the vehicle is registered *(details in part 4)*;

(b) Vehicle Keeper Marking *(details in part 1)*;

(c) abbreviations of the technical characteristics (details in part 12 for the wagons, part 13 for the hauled passenger vehicles).

The European Vehicle Number shall be changed when it does not reflect the interoperability capability or technical characteristics according to this Appendix due to technical modifications of the vehicle. Such technical modifications may require a new placing in service according to Articles 20 to 25 of Directive 2008/57/EC.

## PART 1 — VEHICLE KEEPER MARKING

### 1. **Definition of the Vehicle Keeper Marking (VKM)**

A Vehicle Keeper Marking (VKM) is an alphabetic code, consisting of 2 to 5 letters ([2]). A VKM is inscribed on each rail vehicle, near the European Vehicle Number. The VKM identifies the Vehicle Keeper as registered in a National Vehicle Register.

A VKM is unique and valid in all countries covered by this TSI and all countries that enter into an agreement that involves the application of the system of vehicle numbering and VKM as described in this TSI.

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2. **Format of the Vehicle Keeper Marking**

The VKM is representation of the full name or abbreviation of the vehicle keeper, if possible in a recognisable manner. All 26 letters of the Latina alphabet may be used. The letters in the VKM are written in capitals. Letters that do not stand for first letters of words in the keeper's name may be written in lower case. For checking uniqueness, the letters written in lower case will be taken as written in capitals.

Letters may contain diacritical signs ([3]). Diacritical signs used by these letters are ignored for checking uniqueness.

For vehicles of keepers that reside in a country that does not use the Latin alphabet, a translation of the VKM in its own alphabet may be applied behind the VKM separated from it by a slash-sign ('/'). This translated VKM is disregarded for data-processing purposes.

3. **Provisions about allocation of Vehicle Keeper Markings**

A vehicle keeper can be issued more than one VKM, in case:

— the vehicle keeper has a formal name in more than one language;

— a vehicle keeper has good cause to distinguish between separate vehicle fleets within his organisation.

A single VKM can be issued for a group of companies:

— that belong to single corporate structure (e.g. holding structure);

— that belong to a single corporate structure that has appointed and mandated one organisation within this structure to handle all issues on behalf of all others;

— that has mandated a separate, single legal entity for handling all issues on their behalf, in which event the legal entity is the keeper.

4. **Register of Vehicle Keeper Markings and procedure for allocation**

The register of VKM is public and updated on a real time basis.

An application for a VKM is filed with the applicant's competent national authority and forwarded to the ERA. A VKM can be used only after publication by the ERA.

The holder of a VKM must inform the competent national authority when he ends the use of a VKM, and the competent national authority will forward the information to the ERA. A VKM will then be revoked once the keeper has proved that the marking has been changed on all vehicles concerned. It will not be reissued for 10 years, unless it is reissued to the original holder or at his request to another holder.

A VKM can be transferred to another holder, which is the legal successor to the original holder. A VKM stays valid when the VKM's holder changes his name to a name that does not bear resemblance to the VKM.

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In case of a change of keeper which entails a change of VKM, the vehicles concerned must be marked with the new VKM within three months from the date of registration of the change of keeper in the National Vehicle Register. In case of inconsistency between the VKM marked on the vehicle and the data registered in the NVR, the NVR-registration supersedes.

PART 2

Not used

PART 3 — RULES FOR THE DETERMINATION OF THE CHECK-DIGIT (DIGIT 12)

The check-digit is determined in the following manner:

— the digits in the even positions of the basic number (counting from the right) are taken at their own decimal value;

— the digits in the odd positions of the basic number (counting from the right) are multiplied by 2;

— the sum formed by the digits in even position and by all the digits which constitute the partial products obtained from the odd positions is then established;

— the unit's digit of this sum is retained;

— the complement required to bring the unit's digit to 10 forms the check-digit; should this units digit be nought, then the check-digit will also be nought.

**Examples:**

1 —

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Let the basic number be | 3 | 3 | 8 | 4 | 4 | 7 | 9 | 6 | 1 | 0 | 0 |
| Multiplication factor | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| | 6 | 3 | 16 | 4 | 8 | 7 | 18 | 6 | 2 | 0 | 0 |

Sum: 6 + 3 + 1 + 6 + 4 + 8 + 7 + 1 + 8 + 6 + 2 + 0 + 0 = 52
The unit's digit of this sum is 2.

The check-digit number will therefore be 8 and the basic number thus becomes the registration number 33 84 4796 100 – 8.

2 —

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Let the basic number be | 3 | 1 | 5 | 1 | 3 | 3 | 2 | 0 | 1 | 9 | 8 |
| Multiplication factor | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| | 6 | 1 | 10 | 1 | 6 | 3 | 4 | 0 | 2 | 9 | 16 |

Sum: 6 + 1 + 1 + 0 + 1 + 6 + 3 + 4 + 0 + 2 + 9 + 1 + 6 = 40
The unit's digit of this sum is 0.

The check-digit number will therefore be 0 and the basic number thus becomes the registration number 31 51 3320 198 – 0.

▼B

PART 4 — CODING OF THE COUNTRIES IN WHICH THE VEHICLES ARE REGISTERED (DIGITS 3-4 AND ABBREVIATION)

*The Information relating to third countries is given for information purposes only.*

| Countries | Alphabetical country code (1) | Numerical country code |
|---|---|---|
| Albania | AL | 41 |
| Algeria | DZ | 92 |
| Armenia | AM | 58 |
| Austria | A | 81 |
| Azerbaijan | AZ | 57 |
| Belarus | BY | 21 |
| Belgium | B | 88 |
| Bosnia-Herzegovina | BIH | 49 |
| Bulgaria | BG | 52 |
| China | RC | 33 |
| Croatia | HR | 78 |
| Cuba | CU (1) | 40 |
| Cyprus | CY | |
| Czech Republic | CZ | 54 |
| Denmark | DK | 86 |
| Egypt | ET | 90 |
| Estonia | EST | 26 |
| Finland | FIN | 10 |
| France | F | 87 |
| Georgia | GE | 28 |
| Germany | D | 80 |
| Greece | GR | 73 |
| Hungary | H | 55 |
| Iran | IR | 96 |
| Iraq | IRQ (1) | 99 |
| Ireland | IRL | 60 |
| Israel | IL | 95 |
| Italy | I | 83 |
| Japan | J | 42 |
| Kazakhstan | KZ | 27 |
| Kyrgyzstan | KS | 59 |
| Latvia | LV | 25 |
| Lebanon | RL | 98 |
| Liechtenstein | FL | |
| Lithuania | LT | 24 |
| Luxembourg | L | 82 |
| Macedonia | MK | 65 |
| Malta | M | |
| Moldova | MD (1) | 23 |
| Monaco | MC | |
| Mongolia | MGL | 31 |
| Montenegro | MNE | 62 |
| Morocco | MA | 93 |
| Netherlands | NL | 84 |
| North Korea | PRK (1) | 30 |
| Norway | N | 76 |
| Poland | PL | 51 |
| Portugal | P | 94 |
| Romania | RO | 53 |
| Russia | RUS | 20 |
| Serbia | SRB | 72 |
| Slovakia | SK | 56 |
| Slovenia | SLO | 79 |
| South Korea | ROK | 61 |
| Spain | E | 71 |
| ►C1 Sweden | S | 74 ◄ |
| Switzerland | CH | 85 |
| Syria | SYR | 97 |
| Tajikistan | TJ | 66 |
| Tunisia | TN | 91 |
| Turkey | TR | 75 |
| Turkmenistan | TM | 67 |
| Ukraine | UA | 22 |
| United Kingdom | GB | 70 |
| Uzbekistan | UZ | 29 |
| Vietnam | VN (1) | 32 |

(1) According to the alphabetical coding system described in Appendix 4 to the 1949 convention and Article 45(4) of the 1968 convention on road traffic.

PART 5

Not used

▼B

PART 6 — INTEROPERABILITY CODES USED FOR WAGONS (DIGITS 1-2)

<table>
<tr><td></td><td colspan="2">1st digit 2nd digit</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td colspan="2">2nd digit 1st digit</td></tr>
<tr><td></td><td></td><td>Track Gauge</td><td>fixed or variable</td><td>fixed</td><td>variable</td><td>fixed</td><td>variable</td><td>fixed</td><td>variable</td><td>fixed</td><td>variable</td><td>fixed or variable</td><td>Track Gauge</td><td></td></tr>
<tr><td rowspan="4">Wagons conform to TSI WAG (a) including section 7.1.2 and all conditions set out in Appendix C</td><td>0</td><td>with axles</td><td rowspan="4">Not to be used</td><td colspan="2" rowspan="2">wagons</td><td colspan="5" rowspan="2">not to be used (c)</td><td rowspan="2">PPV/PPW wagons (variable gauge)</td><td>with axles</td><td>0</td></tr>
<tr><td>1</td><td>with bogies</td><td>with bogies</td><td>1</td></tr>
<tr><td>2</td><td>with axles</td><td colspan="7" rowspan="2">wagons</td><td rowspan="2">PPV/PPW wagons (fixed gauge)</td><td>with axles</td><td>2</td></tr>
<tr><td>3</td><td>with bogies</td><td>with bogies</td><td>3</td></tr>
<tr><td rowspan="2">Other wagons</td><td>4</td><td>with axles (b)</td><td rowspan="2">maintenance related wagons</td><td colspan="7" rowspan="2">Other wagons</td><td rowspan="2">Wagons with special numbering for technical characteristics not placed in service inside EU</td><td>with axles (b)</td><td>4</td></tr>
<tr><td>8</td><td>with bogies (b)</td><td>with bogies (b)</td><td>8</td></tr>
<tr><td></td><td></td><td></td><td colspan="11"></td><td></td><td></td></tr>
<tr><td></td><td colspan="2">1st digit 2nd digit</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td colspan="2">1st digit 2nd digit</td></tr>
</table>

(a) Commission Regulation [TSI WAG as adopted after the revision].
(b) Fixed or variable gauge.
(c) Except for wagons in category I (temperature-controlled wagons), not to be used for new vehicles authorised placed in service.

▼B

PART 7 — INTERNATIONAL TRAFFIC ABILITY CODES USED FOR HAULED PASSENGER VEHICLES (DIGITS 1-2)

| | Domestic traffic | TEN ([a]) and/or COTIF ([b]) and/or PPV/PPW | | | | Domestic traffic or international traffic by special agreement | TEN ([a]) and/or COTIF ([b]) | PPV/PPW | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2nd digit<br>1st digit | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 5 | Vehicles for domestic traffic | Fixed-gauge non-air-conditioned vehicles (including car-carrying wagons) | Gauge-adjustable (1435/1520) non-air-conditioned vehicles | Not to be used | Gauge-adjustable (1435/1668) non-air-conditioned vehicles | Historical vehicles | Not to be used ([c]) | Fixed-gauge vehicles | Gauge-adjustable (1435/1520) vehicles with change of bogies | Gauge-adjustable (1435/1520) vehicles with gauge-adjustable axles |
| 6 | Service vehicles | Fixed-gauge air-conditioned vehicles | Gauge-adjustable (1435/1520) air-conditioned vehicles | Service vehicles | Gauge-adjustable (1435/1668) air-conditioned vehicles | Car-carrying wagons | Not to be used ([c]) | | | |
| 7 | Air-conditioned and pressure-tight vehicles | Not to be used | Not to be used | Pressure-tight fixed-gauge air-conditioned vehicles | Not to be used | Other vehicles | Not to be used | Not to be used | Not to be used | Not to be used |

([a]) Compliance with the applicable TSIs, see appendix P, part 5.
([b]) Including vehicles, which according to existing regulations carry the digits defined in the present table. COTIF: vehicle compliant with COTIF regulation in force at the moment of placing in service
([c]) Excepted for coaches with fixed gauge (56) and adjustable gauge (66) already in service, not to be used for new vehicles

▼B

PART 8 — TYPES OF TRACTIVE ROLLING STOCK AND UNITS IN A TRAIN SET IN FIXED OR PRE-DEFINED FORMATION (DIGITS 1-2)

The first digit is ‘9’.

If the second digit describes the type of tractive stock, following coding is mandatory:

| Code | General vehicle type |
|---|---|
| 0 | Miscellaneous |
| 1 | Electric locomotive |
| 2 | Diesel locomotive |
| 3 | Electric multiple-unit set (high speed) [power car or trailer] |
| 4 | Electric multiple-unit set (except high speed) [power car or trailer] |
| 5 | Diesel multiple-unit set [power car or trailer] |
| 6 | Specialised trailer, |
| 7 | Electric shunting engine |
| 8 | Diesel shunting engine |
| 9 | Special vehicle |

PART 9 — STANDARD NUMERICAL MARKING OF WAGONS (DIGITS 5 TO 8)

Part 9 indicates the numerical marking associated to the main technical characteristics of the wagon and it is published on the ERA website (www.e-ra.europa.eu).

An application for a new code is filed with the registering entity (as referred to in Decision 2007/756/EC) and sent to the ERA. A new code can be used only after publication by the ERA.

PART 10 — CODES FOR THE TECHNICAL CHARACTERISTICS OF THE HAULED PASSENGER STOCK (DIGITS 5-6)

Part 10 is published on the ERA website (www.era.europa.eu).

An application for a new code is filed with the registering entity (as referred to in Decision 2007/756/EC) and sent to the ERA. A new code can be used only after publication by the ERA.

PART 11 — CODES FOR THE TECHNICAL CHARACTERISTICS OF THE SPECIAL VEHICLES (DIGIT 6 TO 8)

Part 11 is published on the ERA website (www.era.europa.eu).

An application for a new code is filed with the registering entity (as referred to in Decision 2007/756/EC) and sent to the ERA. A new code can be used only after publication by the ERA.

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PART 12 — LETTER MARKING FOR WAGONS EXCLUDING ARTICULATED AND MULTIPLE WAGONS

Part 12 is published on the ERA website (www.era.europa.eu).

An application for a new code is filed with the registering entity (as referred to in Decision 2007/756/EC) and sent to the ERA. A new code can be used only after publication by the ERA.

PART 13 — LETTER MARKING FOR HAULED PASSENGER STOCK

Part 13 is published on the ERA website (www.era.europa.eu).

An application for a new code is filed with the registering entity (as referred to in Decision 2007/756/EC) and sent to the ERA. A new code can be used only after publication by the ERA.

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([1]) For special vehicles, the number has to be unique in a given country with the first digit and the 5 last digits of the technical characteristics and serial number.

([2]) For NMBS/SNCB, the use of an encircled single letter B can be continued.

([3]) Diacritical marks are ‘accent-signs’, such as in À, Ç, Ö, Č, Ž, Å etc. Special letters such as Ø and Æ will be represented by a single letter; in tests for uniqueness Ø is treated as O and Æ as A.’