



CR TSI Locomotives and Passenger RST

Scope



Scope of the CR LOC&PAS TSI

- Geographical scope
- Types of RST in the scope of TSI
- Aspects covered by the TSI
- Aspects not covered
- Aspects covered in other TSIs (PRM, SRT, Noise)
- Aspect covered by other EU directives



- The geographical scope of this TSI is the **CR TEN network**.
- The following points of the Directive adopted in 2008 are not covered (national rules will continue to apply):
 - CR rolling stock running on the HS network
 - Extension to the non-TEN network
- A HS RST (speed ≥ 190 km/h) running on both HS and CR network will have to comply to both TSIs (HS and CR).



According to the Directive Annex I, RST to be covered by this TSI is classified as follows:

- A) Self-propelling thermal and/or electric trains**
- B) Thermal or electric traction units**
- C) Passenger carriages**
- D) Mobile railway infrastructure construction & maintenance equipment**



A) Self-propelling thermal and/or electric trains:

A **trainset** is a fixed formation that can operate as a train; it is by definition not intended to be reconfigured, except within a workshop environment. It is composed of only motored or of motored and non-motored vehicles.

An **Electric and/or Diesel Multiple Unit** is a trainset in which all vehicles are capable of carrying passengers or luggage / mail.

A **Railcar** is a vehicle that can operate autonomously and is capable of carrying passengers or luggage/mail.

A **Light Rail rolling stock** is a rolling stock designed to operate mainly on urban tramway networks; it may operate on limited parts of the conventional rail system network. It is intended to carry passengers in urban and suburban areas (also known as Tramtrain). it is **not in the scope** of this TSI.



B) Thermal or electric traction units:

A **Locomotive** is a traction vehicle (or combination of several vehicles) that is not intended to carry a payload and has the ability to uncouple in normal operation from a train and to operate independently.

It is intended for freight or/and passenger transport.

Traction in a self-propelling train can be provided by a powered vehicle with or without driving cab, which is not intended to be uncoupled during normal operation. Such a vehicle is called a **Power Car** in general or a **Power Head** when located at one end of the trainset and fitted with a driving cab.

A **Shunter** (shunting locomotive) is a traction unit designed for use only on shunting yards, stations and depots; it is **not in the scope** of this TSI.



C) Passenger carriages and other related cars:

Passenger carriages: This type includes non-traction vehicles carrying passengers, and operated in a variable formation with vehicles from the category “thermal or electric traction units” defined above to provide the traction function.

It includes coached and fixed Rake of Coaches (non-traction formation of several coaches “semi-permanently” coupled together, or which can be reconfigured only when it is out of service).

Non-passenger carrying vehicles included in a passenger train:

Non traction vehicles included in passenger trains (e.g. luggage or postal vans, car carriers, vehicles for service...) are in the scope of this TSI.

Freight wagons are not in the scope of this TSI; they are covered by the “freight wagons” TSI even when they are included in a passenger train (the train composition is in this case an operational issue).

Vehicles intended to carry road motor vehicles with persons on-board these road motor vehicles are not in the scope of this TSI.



D) Mobile railway infrastructure construction & maintenance equipment (or on-track machines)

On track Machines (OTMs) are vehicles specially designed for construction and maintenance of the track and infrastructure. OTMs are used in different modes: working mode, transport mode (self-propelling vehicle or hauled vehicle).

Infrastructure inspection vehicles utilised to monitor the condition of the infrastructure are considered as OTMs as defined above.

This type of rolling stock is in the scope of the TSI only when:

- It is running on its own rail wheels,

- It is designed to have characteristics necessary for the operation of track based train detection systems and

- it is in **transport (running) configuration on its own rail wheels**, self-propelled or hauled.

Working configuration is outside the scope of this TSI.



- **For the purpose of the TSI, a “Unit” is the entity submitted to the assessment:**
 - Locomotive, trainset, carriage, rake of carriages, etc.
- **“Units” main categories for the application of the RST TSI:**
 - Unit designed to carry passengers or related loads
 - Unit fitted with driving cab
 - Unit equipped with traction or power equipment
- **A “train” is an operational configuration**
 - Some requirements are expressed at train level
 - When the assessed “unit” is not a “train”, interface with “Operation” to meet the requirement at train level.
- A “vehicle” is the smallest part of a “Unit”



Aspects covered by the TSI

INTEROPERABILITY under Directive 2008\57\EC

DEFINITION

“the ability of the trans-European rail system to allow the **safe** and **uninterrupted** movement of trains“

“this ability depends on all the regulatory, technical and operational conditions which must be met in order to satisfy the essential requirements”

OBJECTIVES

Facilitate – Improve – Develop
International rail transport service

Achieve interoperability on
The Trans-European Network

Contribute to the creation of an
Internal market in equipment and
services.



Aspects covered by the TSI

- Requirements to ensure **interoperability, as defined in the Directive**, including technical compatibility with other sub-systems (target system as defined by the relevant TSIs), and safety related items, expressed as functional requirements.
- These requirements are of mandatory application (TSI is a law) in the procedure of **EC declaration of verification** drawn up by the Applicant, necessary for Member States to grant the authorisation for placing in service of vehicles.
- Requirements expressed in the TSI correspond to the **optimal level of harmonisation at the level of the EU** (Directive, Article 1(2)).
- The examination of the existing regulations (national level) is the basis for defining technical requirements. The objective is not to “invent” a new railway system.



Aspects covered by the TSI

- The specification of technical solutions shall be avoided, except when strictly necessary (physical interface between subsystems, widely recognised design proven solution ensuring safety...).
- The economic impact of the requirements shall be analysed, in order to avoid negative effect on the competitiveness of the railway sector.
- The TSI is not a comprehensive technical specification of a RST. Other technical specifications (customer requirements) are necessary in order to design a RST.



Aspects not covered by the TSI

- **Technical compatibility with existing not TSI compliant subsystems** (Infrastructure, Energy, CCS), except when the existing subsystem is covered by a specific case.
- For **locomotives, coaches, vans or trainsets: coupling ability** and functional interfaces between vehicles, in order to facilitate the formation of trains with individual vehicles of different origins.
Requirements needed for this functionality include: Coupling and buffing gear, Brake interface, Train power supply line, Data communication bus, Gangway between vehicles.
Decision has been made not to cover this aspect, because it is not a condition for a vehicle to get an authorisation; it remains in the voluntary domain (exchange of vehicles between RUs; ref. RIC agreement).



Aspects covered in other TSIs

❖ PRM TSI

- ✓ 1st publication
- ✓ Entered into force 1 July 2008
- ✓ Applies to both High Speed and Conventional Rail systems
- ✓ Addresses access to people with reduced mobility.

❖ SRT TSI

- ✓ 1st publication
- ✓ Entered into force July 2008
- ✓ Applies to both High Speed and Conventional Rail systems.
- ✓ Refers to HS RST TSI for subjects related to fire safety, evacuation and rescue.

❖ NOISE TSI

- ✓ 1st publication
- ✓ Entered into force June 2006
- ✓ Applies to the Conventional Rail system (noise aspects are covered in the HS RST TSI)
- ✓ Covers stand-by, starting and pass-by noise of wagons, locomotives and pas. RST



Aspects covered in the PRM TSI

Commission Decision 2008/164/EC of December 21st, 2007

Requirements related to Passenger amenities in LOC&PAS
TSI §4.2.5

Additional requirements in PRM TSI:

- Accommodation
 - ✓ seats, including priority seats
 - ✓ wheelchair locations
 - ✓ wheelchair accessible sleeping accommodation
 - ✓ toilets
 - ✓ lighting
- Customer Information.



Aspects covered in the PRM TSI

Commission Decision 2008/164/EC of December 21st, 2007

Additional requirements in PRM TSI (2):

- Access and egress
 - ✓ exterior doors, (incl. dimensions, obstacle detectors and controls)
 - ✓ step and boarding aids (position, dimension etc.)
 - ✓ handrails
- Passenger circulation
 - ✓ interior doors, (incl. dimensions and controls)
 - ✓ floor height changes
 - ✓ clearways (also impacts 4.2.2.3 “gangways”)



Aspects covered in the SRT TSI

Commission Decision 2008/163/EC of December 20th, 2007

Categorisation of RST for Fire Safety and Evacuation defined in LOC&PAS TSI

- ✓ §4.1.4 Follows SRT TSI Categories (A, B, Freight and OTMs)
- ✓ §4.2.10.1.1 There is no additional category i.e. Cat A is the minimum category for Passenger RST
- ✓ §4.2.10.2 For freight locos and OTMs



Categorisation of RST in relation to tunnel length

❖ **Cat. B**

- ✓ Designed to operate on all infrastructure of the TEN
- ✓ 15 minutes running capability in order to drive out of the tunnel in case of fire
- ✓ Applicable from July 2008 for CR and HS RST

❖ **Cat. A**

- ✓ Designed to operate in all TEN tunnels of maximum 5km length
- ✓ 4 minutes running capability
- ✓ Applicable from July 2008 for CR and HS RS



Aspects covered in the SRT TSI

Commission Decision 2008/163/EC of December 20th, 2007

Additional requirements to RST stated in the SRT TSI:

- Fire Detection/protection/mitigation
 - ✓ On board fire detectors
 - ✓ Material properties for rolling stock
 - ✓ Fire extinguishers for passenger rolling stock
 - ✓ Fire barriers for passenger rolling stock (amended by L&P 4.2.10.5)
 - ✓ Fire protection for freight trains
 - ✓ Respirator in Freight locomotive cab (LOC&PAS 4.2.9.4)



Aspects covered in the SRT TSI

Commission Decision 2008/163/EC of December 20th, 2007

Additional requirements to RST stated in the SRT TSI (2):

- Additional measures for running capability of passenger rolling stock with a fire on board:

- ✓ Availability of traction (LOC&PAS 4.2.8.1.2)
- ✓ Communication means on trains
- ✓ Emergency brake override
- ✓ Emergency lighting system in the train
- ✓ Switching off of air conditioning in the train

- Passenger evacuation

- ✓ Door emergency opening (LOC&PAS 4.2.5.6)
- ✓ Escape design of passenger rolling stock
- ✓ Rescue service's information and access



Aspects covered in the NOI TSI

Commission Decision 2006/66/EC of December 23rd , 2005

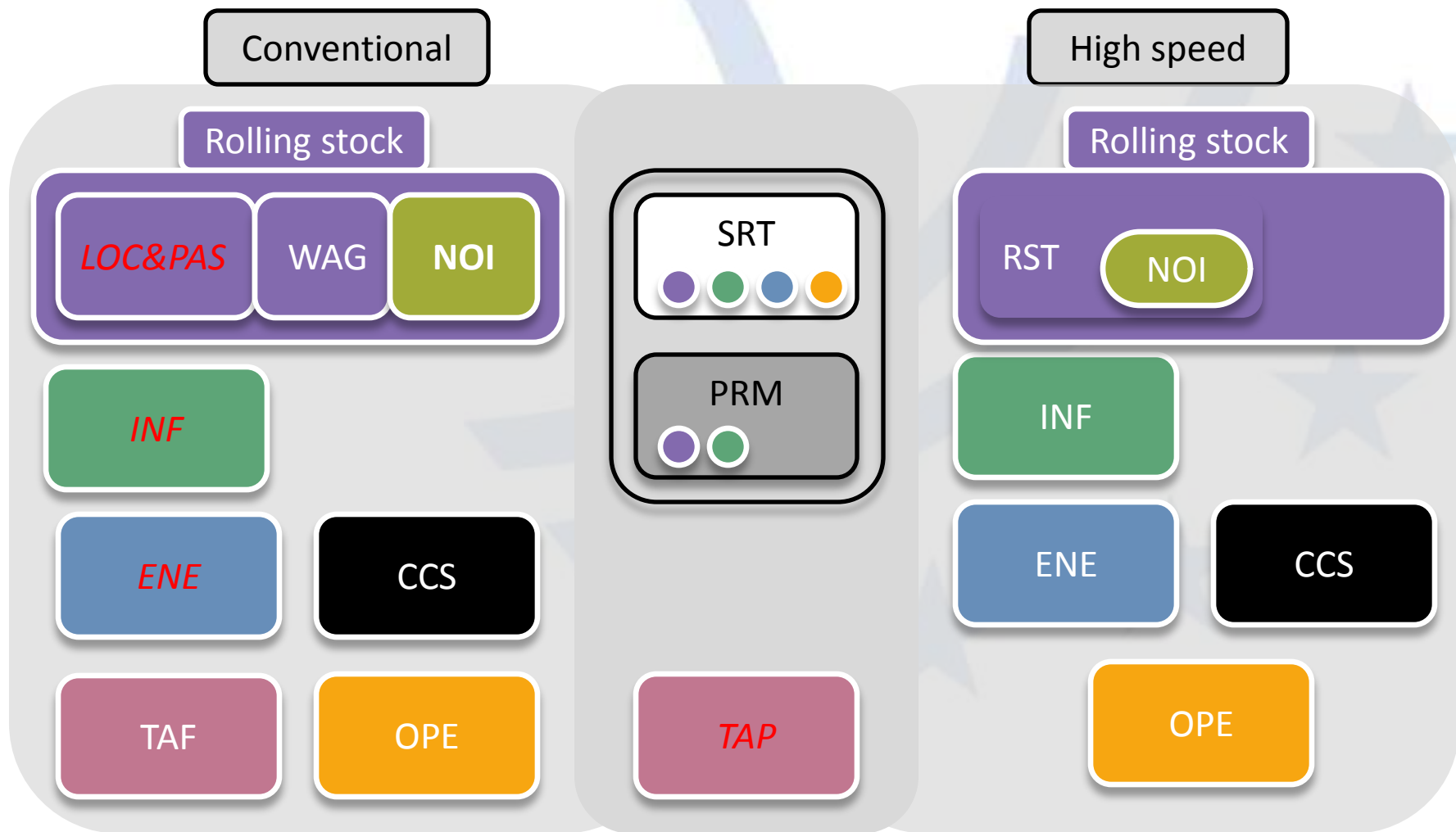
No requirements related to Exterior noise emission in PAS&LOC TSI

Requirements for noise emitted by locomotives, multiple units and coaches are stated in the NOI TSI:

- Limits for noise emission
 - ✓ limits for stationary noise
 - ✓ limits for starting noise
 - ✓ limits for pass-by noise
- Measuring conditions (EN/ISO 3095 amended by Annex A).



TSIs / Subsystems





TSIs applicable to RST

- **HS network :**
 - RST TSI (including noise), CCS TSI (on-board part), “Access to Persons with Reduced Mobility” and “Safety in Railway Tunnels” are in force
- **CR network:**
 - Freight Wagons TSI is in force
 - Noise TSI, CCS TSI (on-board part), “Access to Persons with Reduced Mobility” and “Safety in Railway Tunnels” are in force
 - CR LOC&PAS TSI to be published in 2010 (this TSI)



Aspects covered by other EU directives

- **Electromagnetic compatibility:**
Regulation for electromagnetic emission and immunity is laid down in Directive 89/336/EEC, and standards EN 50121; regulation for human exposure is laid down in Directive 2004/40/EC.
They apply for the compatibility of Railway systems with their external environment (telecommunications...).
- **Environmental protection:**
Several EU Directives are dealing with this subject. The Interoperability Directive includes also requirements on environmental protection, referring to the Community provisions in force.
- **Diesel engines exhaust emissions:**
Regulation for exhaust emissions is laid down in Directive 97/68/EC.
- **Sanitary systems:**
Regulation for domestic waste water discharge is laid down in Directive 2000/60/EC.



Thank you for your attention!

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