

TSI Open Days

Day 1

20 and 21 January 2025 | Warsaw, Poland



EUROPEAN
UNION
AGENCY
FOR RAILWAYS

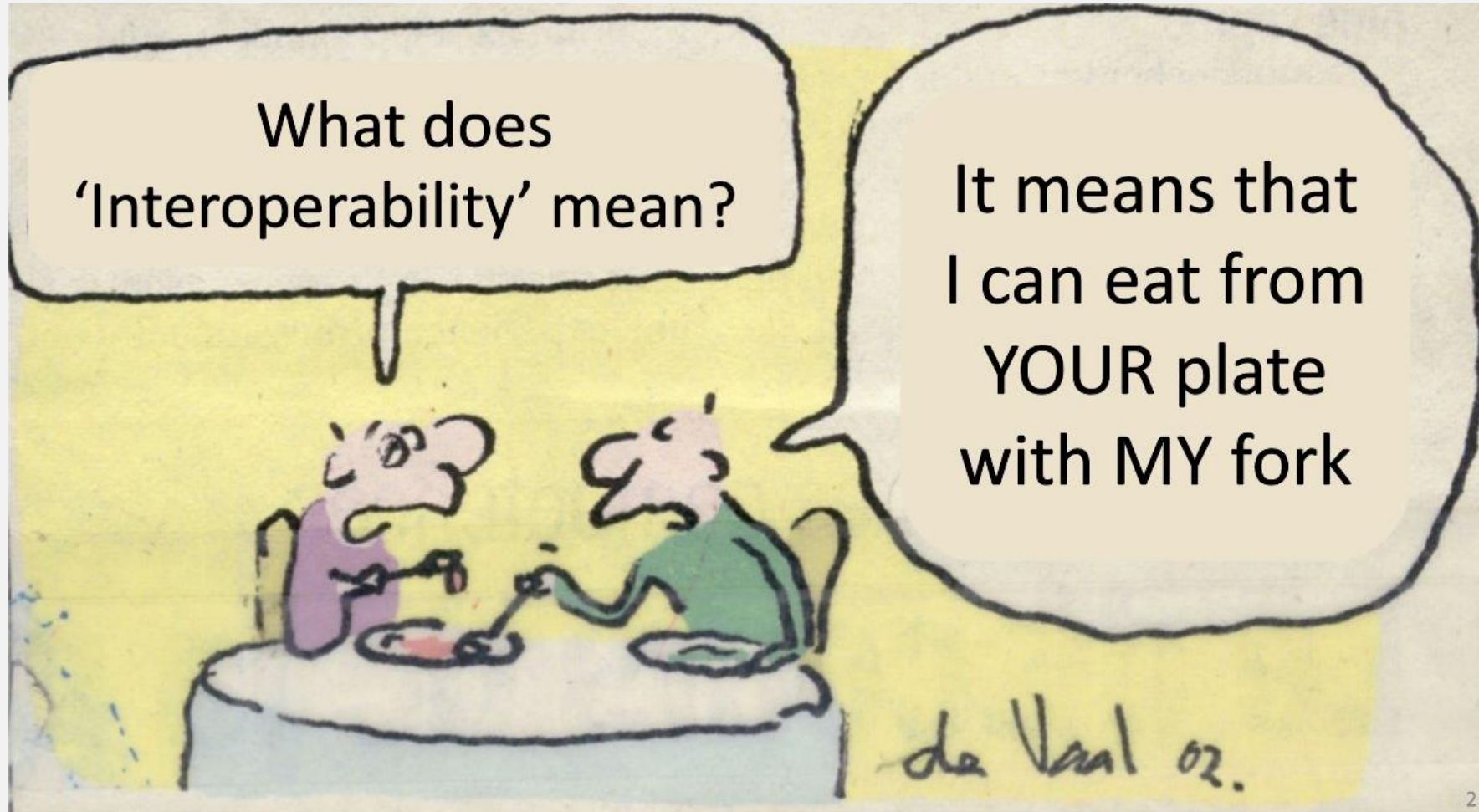


Interoperability – 4th Railway Package

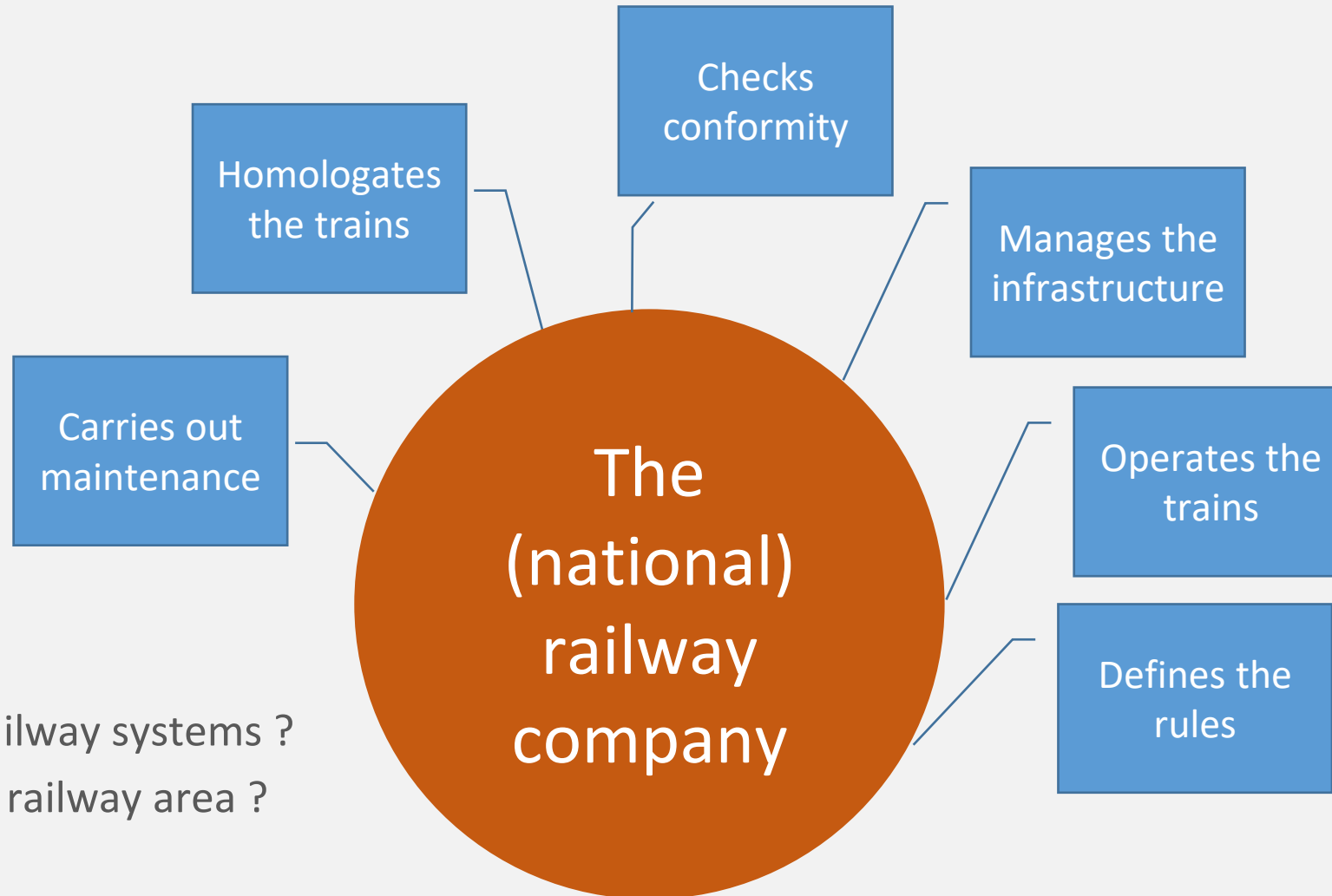


- Chronology of the Railway packages.
- Focus on the Interoperability Directive (EU) 2016/797

How to understand this drawing?



25 years ago – 1 actor per country



- open market ?
- Interoperable railway systems ?
- single European railway area ?

25 years of Commission efforts

Objectives

- Restructure the European rail transport market
- Strengthen the position of railways

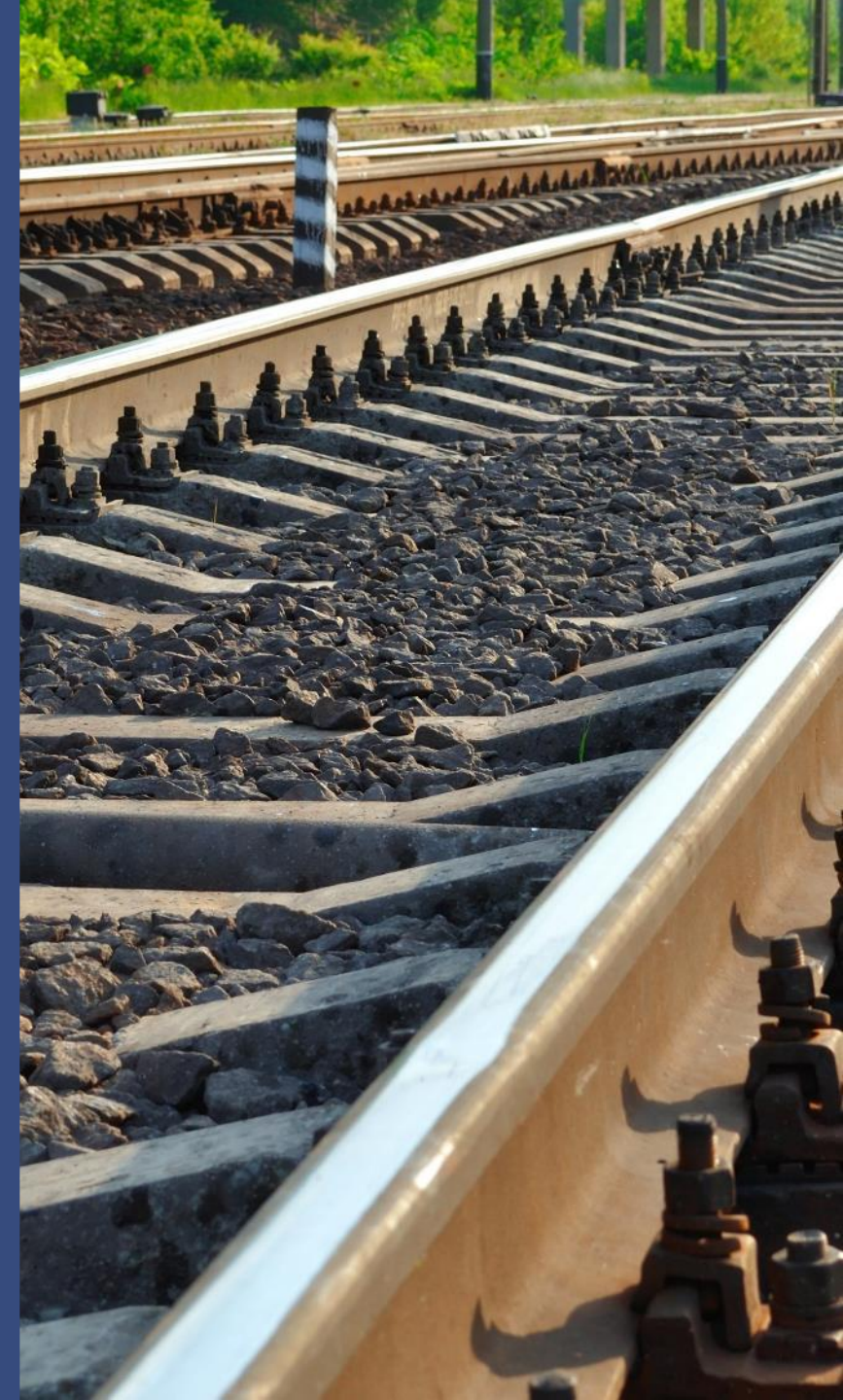
Areas of action

- rail transport market,
- national networks
- rail transport infrastructure.

Four legislative packages to

- open up rail transport service markets for competition,
- make national railway systems interoperable
- define appropriate framework conditions for the development of a single European railway area

Railway Packages



First railway package of 2001

February 2001, the Council adopted three Directives known as the "**rail infrastructure package**".

- rail operators have access to the trans-European network on a non-discriminatory basis,
 - levying of charges for the use of railway infrastructure
 - licensing of railway undertakings
-
- [Directive 2001/12/EC of 26 February 2001 amending Council Directive 91/440/EEC on the development of the Community's railways](#)
 - [Directive 2001/13/EC of 26 February 2001 amending Council Directive 95/18/CE on the licensing of railway undertakings](#)
 - [Directive 2001/14/EC of 26 February 2001 on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification](#)



2001 - High Speed 1, Britain's first high-speed rail line opens, allowing trains to run from London to Paris on dedicated high-speed track.

Second railway package of 2004

April 2004, the “**second railway package**”.

- Interoperability and Safety Directives
- Establishment of the **European Railway Agency**
 - A driving force in the policy for modernising the European railway sector.
 - Work to align technical regulations and establish common safety objectives for all Europe's railways.
- [Directive 2004/49/EC of 29 April 2004 on safety on the Community's railways and amending Council Directive 95/18/CE on the licensing of railway undertakings and Directive 2001/14/CE on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification](#)
- [Directive 2004/50/EC of 29 April 2004 amending Council Directive 96/48/EC on the interoperability of the trans-European high-speed rail system and Directive 2001/16/EC of the European Parliament and of the Council on the interoperability of the trans-European conventional rail system](#)
- [Directive 2004/51/EC of 29 April 2004 amending Council Directive 91/440/EEC on the development of the Community's railways](#)
- [Regulation \(EC\) No 881/2004 of the European Parliament and of the Council of 29 April 2004 establishing a European Railway Agency](#)



ERA headquarter
in Valenciennes inauguration on 16 June 2009,

Third railway package of 2007

October 2007 the "third railway package"

- Introduction of the European driver licence allowing train drivers to circulate on the entire European network.
- Strengthened the rail passengers' rights.
- Access rights rail freight service from 2007
- Opening of the international passenger transport service market from 2010
- Directive 2007/58/EC of the European Parliament and of the Council of 23 October 2007 amending Council Directive 91/440/EEC on the development of the Community's railways and Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure
- Directive 2007/59/EC of the European Parliament and of the Council of 23 October 2007 on the certification of train drivers operating locomotives and trains on the railway system in the Community
- Regulation (EC) No 1370/2007 of 23 October 2007 on public passenger transport services by rail and by road and repealing Council Regulations (EEC) Nos 1191/69 and 1107/70
- Regulation (EC) No 1371/2007 of 23 October 2007 on rail passengers' rights and obligations
- Regulation (EC) No 1372/2007 of 23 October 2007 amending Council Regulation (EC) No 577/98 on the organisation of a labour force sample survey in the Community



2007 - TGV beats its world record at 574.8km/h



2007 - High speed trains able of 350 km/h are introduced in Spain between Madrid and Barcelona

2008 - the Interoperability Directive not part of a package

Sets out the conditions to be met to achieve interoperability within the Union rail system:

- design, construction, placing in service, upgrading, renewal, operation and maintenance of the subsystems of this system
- professional qualifications, health and safety conditions of the staff who contribute to its operation and maintenance.

Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community (Recast)



2008 – Entry into force of the PRM TSI, first European specific sectoral regulation on accessibility

Fourth Railway Package of 2016

A set of 6 legislative texts designed to complete the single market for Rail services (Single European Railway Area).

It comprises two 'pillars' which have been negotiated largely in parallel:

- The 'technical pillar', adopted by the European Parliament and the Council in April 2016
- The 'market pillar', adopted in December 2016



2016 – Opening of the Gotthard Base Tunnel, the world's longest and deepest rail tunnel.

Technical pillar

- [Regulation \(EU\) 2016/796 on the European Union Agency for Railways and repealing Regulation \(EC\) n° 881/2004 \(AR\)](#)
- [Directive \(EU\) 2016/797 on the interoperability of the rail system within the European Union \(Recast of Directive 2008/57/EC\) \(IOD\)](#)
- [Directive \(EU\) 2016/798 on railway safety \(Recast of Directive 2004/49/EC\) \(RSD\)](#)

A set of 6 legislative texts

Market pillar

- [Regulation \(EU\) 2016/2338 amending Regulation \(EU\) 1370/2007, which deals with the award of public service contracts for domestic passenger transport services by rail \('PSO Regulation'\)](#)
- [Directive 2016/2370/EU amending Directive 2012/34/EU, which deals with the opening of the market of domestic passenger transport services by rail and the governance of the railway infrastructure \('Governance Directive'\)](#)
- [Regulation \(EU\) 2016/2337 repealing Regulation \(EEC\) 1192/69 on the normalisation of the accounts of railway undertakings](#)

The market pillar objectives

To complete the process of gradual market opening started with the 1st railway package:

- General right for railway undertakings established in one Member State to operate all types of passenger services everywhere in the EU,
- Rules aimed at improving impartiality in the governance of railway infrastructure and preventing discrimination
- Principle of mandatory tendering for public service contracts in rail

The market pillar is expected to deliver more choice and better quality of rail services for European citizens, these being the overriding objectives.

The technical pillar objectives

- To boost the competitiveness of the railway sector with:
 - Authorizations for placing vehicles on the market and safety certificates for railway undertakings valid throughout the EU.
 - A "One stop shop" which is a single entry point for all such applications, using easy, transparent and consistent procedures.
 - Interoperable European Rail Traffic Management System (ERTMS) equipment.
 - A reduction of the number of national rules, which create a risk of insufficient transparency and disguised discrimination of new operators.
- The **European Union Agency for Railways** replaced and succeeded the European Railway Agency

Technical pillar, more than just the IOD



Directives & Regulations

- Directive (EU) 2016/797 Interoperability
- Directive (EU) 2016/798 Safety
- Regulation (EU) 2016/796 The Agency regulation

Commission Implementing Regulations

- (EU) 2018/545 Practical arrangements for VA
- (EU) 2019/250 EC documents template
- (EU) 2021/1903 on the fees and charges
- (EU) 2018/867 on the Board(s) of Appeal

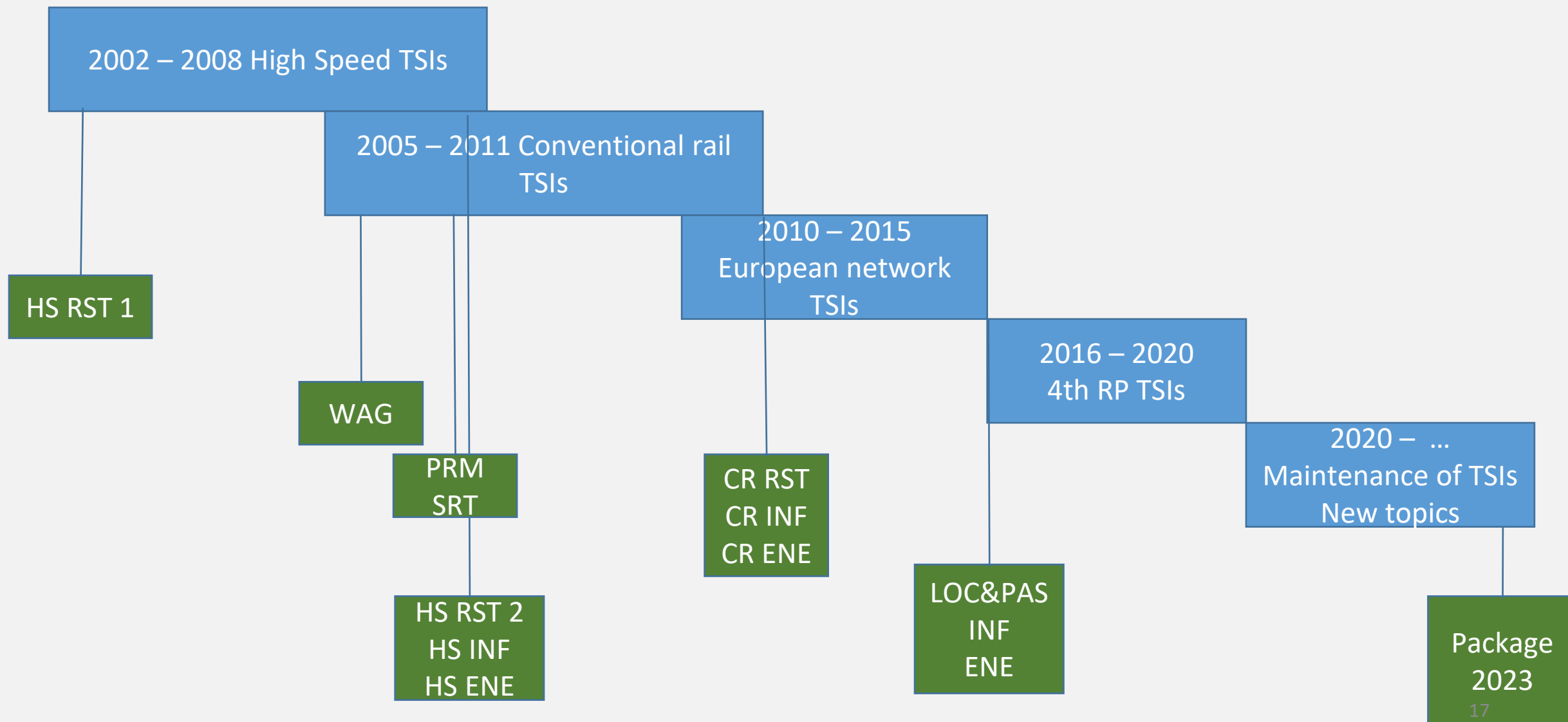
Guidance

- Guidelines for the practical arrangements for the vehicle authorisation process & flowcharts
- Catalogue of examples
- Clarification notes

Agreements

- Cooperation agreements between Agency and NSAs
- Multilateral agreements

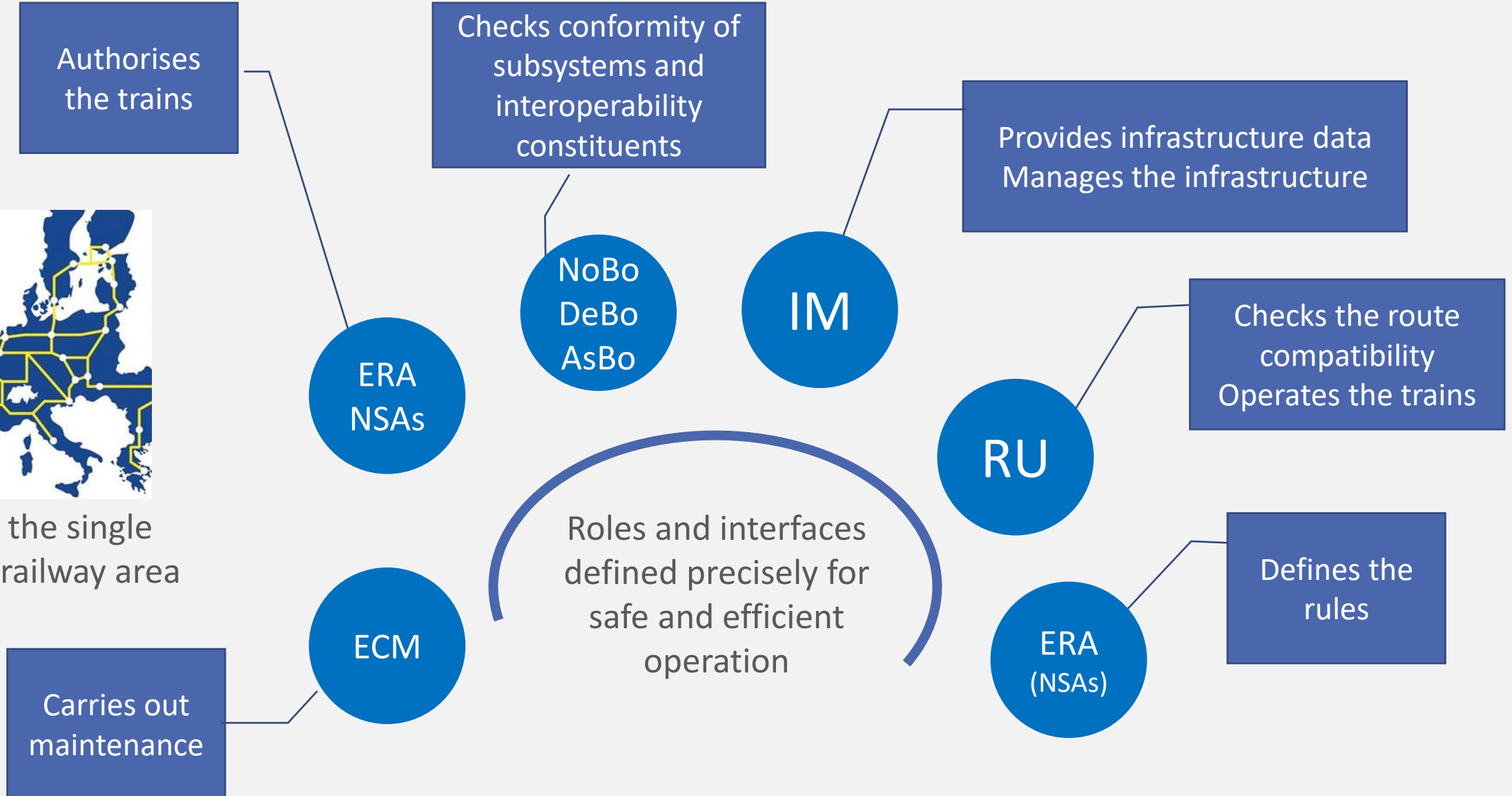
In parallel, chronology of TSIs (not exhaustive)



Today, many actors with defined roles



Towards the single
European railway area



So, what does
'Interoperability' mean
for railway?

...

de Vreal 02.

Interoperability refers to the uninterrupted movement of trains.

It requires...

- An **optimal level of technical harmonization** (*infra & rolling stock*)
- Knowledge of the **technical characteristics** of the **network** (*RINF*)
- Clear rules of **certification and vehicle authorization**

Questions?



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The Technical Specifications for Interoperability



- Why TSIs?
- General description of the structure
- Content of the TSIs
- The TSI package 2023

Flashback: the EU ‘new approach’

“New Approach”: a legislative framework established in the EU in the **80’s** to facilitate technical harmonization, based on four principles:

- 1) Legislative Harmonization:** adoption of essential safety requirements (or other in the general interest) that products must conform to. These products can enjoy free movement throughout the EU.
- 2) Technical Specifications:** drawing up technical specifications needed for the production and placing on the market of products compliant to the essential requirements by standardization organizations.
- 3) Voluntary Standards:** these technical specifications are not mandatory but voluntary standards (Harmonised Standards).
- 4) Presumption of Conformity:** products manufactured in conformity with Harmonised Standards are presumed to conform to the Essential Requirements established by the Directive.

If the railway system was a toy...



Toy Safety standards

- EN 71-1 Mechanical and physical properties
- EN 71-2 Flammability
- EN 71-3 Migration of certain elements
- EN 71-4 Experimental sets for chemistry and related activities
- EN 71-5 Chemical toys (sets) other than experimental sets
- EN 71-7 Finger paints
- EN 71-8 Activity toys for domestic use
- EN 71-9 Organic chemical compounds – Requirements
- EN 71-10 Organic chemical compounds – Sample preparation
- EN 71-11 Organic chemical compounds - Methods of analysis
- EN 71-12 N-Nitrosamines and N-nitrosatable substances (2016-version)
- EN 71-13 Olfactory board games, cosmetic kits and gustative games
- EN 71-14 Trampolines for domestic use

Directive 2009/48/EC of the European Parliament and of the Council of 18 June 2009 on the safety of toys:

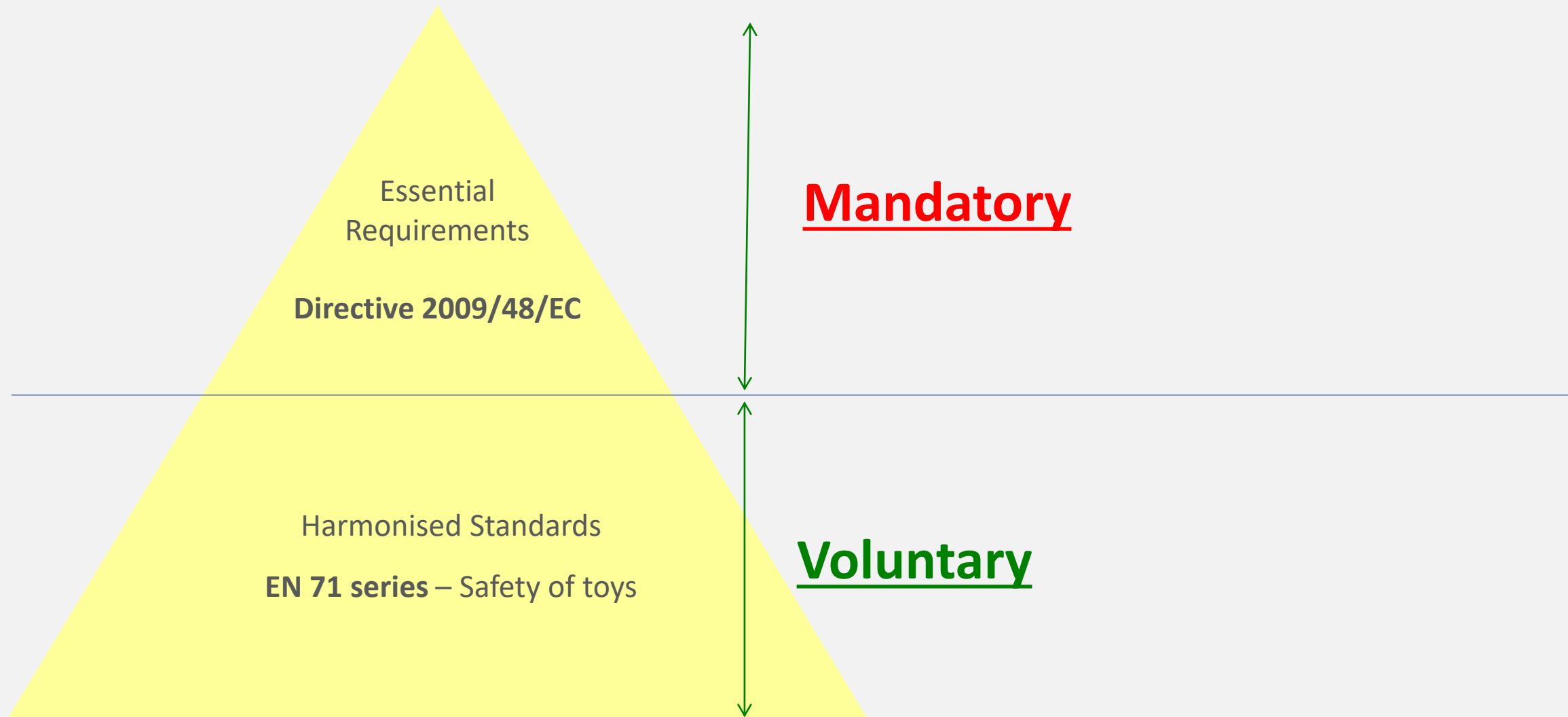
“Toys may not be placed on the market unless they comply with the **essential safety requirements**”

“Toys which are in conformity with **harmonised standards** (...) shall be presumed to be in **conformity with the requirements**”

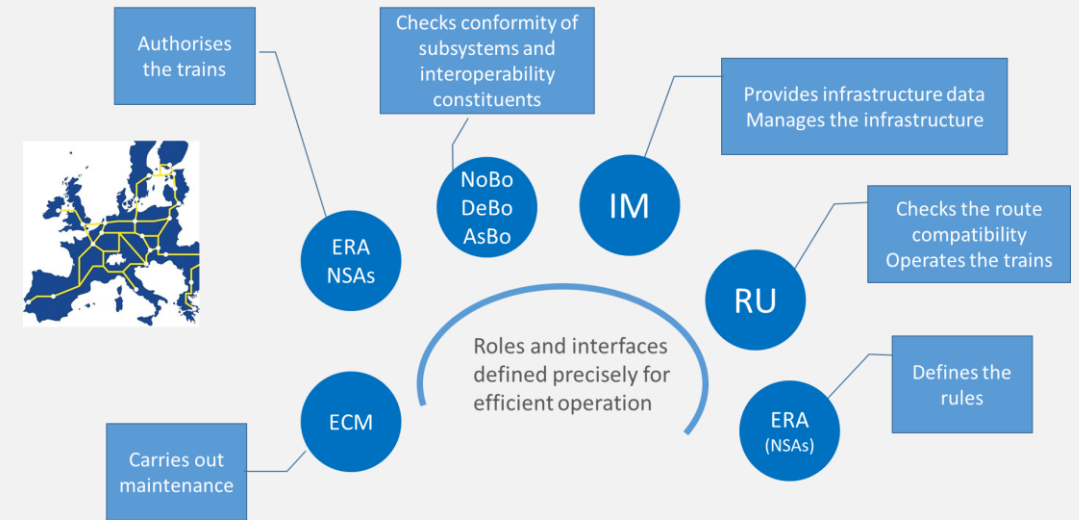
When a **conformity assessment body** notified under Art 22 (‘notified body’) carries out the EC-type examination, it shall evaluate...

EN 71 series – Safety of toys

If the railway system was a toy...



... but the railway system isn't a toy



Interoperability

+

A shared system with many
actors

=

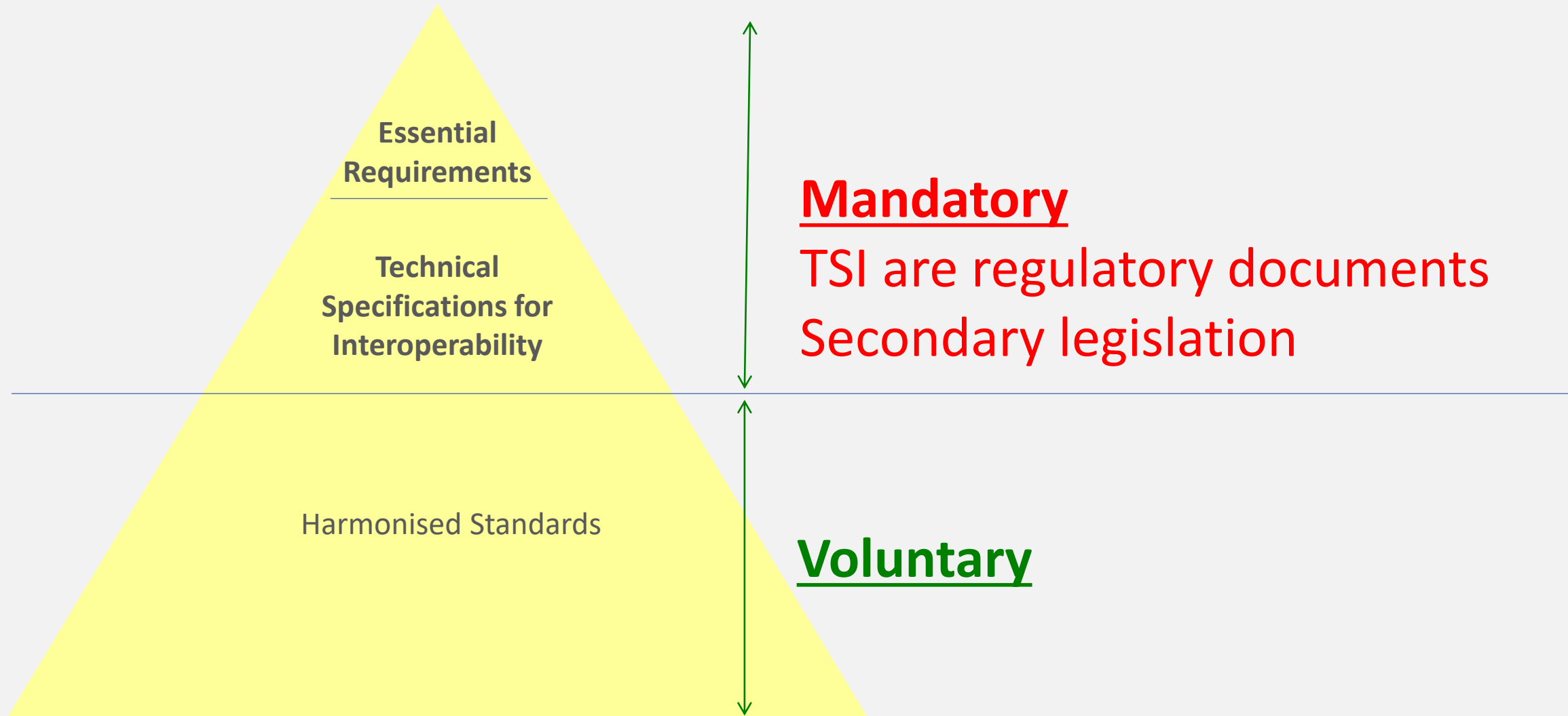
Need for an intermediate layer, the **Technical
Specifications for Interoperability**

Technical Specifications for Interoperability

Remove structural and functional barriers

- Railways have greater or lesser interoperability depending on their conformity to standards on **track gauge, couplings, brakes, signalling, communications, loading gauge, operating rules, etc.**
- The EU **Technical Specifications for Interoperability** (TSIs) aim at removing these obstacles

Where is the TSI intermediate layer?



What is a TSI?

(IOD* Art. 2)

‘technical specification for interoperability’ (TSI)

- a **specification adopted in accordance with this Directive** by which each **subsystem** or part of a subsystem is covered in order to **meet the essential requirements and ensure the interoperability** of the rail system;

‘essential requirements’

- means all the conditions set out in Annex III which must be met by the rail system, the **subsystems**, and the **interoperability constituents**, including interfaces;

**IOD = Interoperability Directive 2016/797*

What are the subsystems covered by TSIs?

(IOD Annex II)

Structural subsystems

- Infrastructure
- Energy
- Trackside control-command and signaling
- On-board control-command and signaling
- Rolling stock

Functional subsystems

- Traffic operation and management
- Maintenance
- Telematics applications for passenger and freight services

How many TSIs? Where to find them?



Structural TSIs

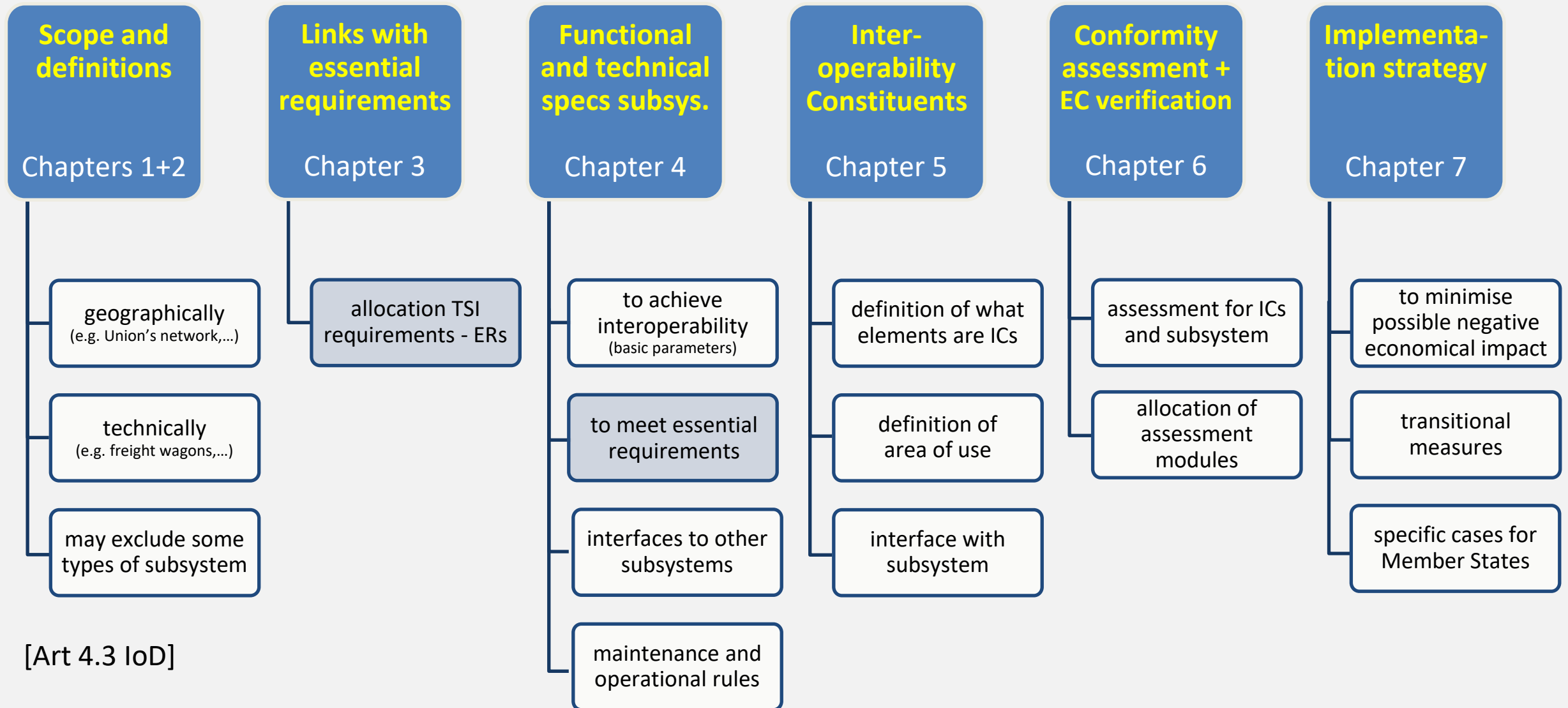
Functional TSIs

[Technical Specifications for Interoperability | European Union Agency for Railways \(europa.eu\)](https://european-union.europa.eu/technical-specifications-for-interoperability)

Subsystems and applicable TSIs

Structural	Infrastructure	INF TSI	SRT TSI	PRM TSI	
	Energy	ENE TSI	SRT TSI		
	Trackside control-command signalling	CCS TSI	SRT TSI		
	On-board control-command signalling	CCS TSI			
	Rolling stock	Loc&Pas TSI or WAG TSI	SRT TSI	PRM TSI	NOI TSI
Functional	Operation and traffic management	OPE TSI	SRT TSI	PRM TSI	
	Maintenance	All TSIs in their respective chapter 4.5			
	Telematic applications passengers and freight	TAP TSI or TAF TSI			

Structure and Content of TSIs



The essential requirements...

(IOD Annex III)

1. Safety

2. Reliability and availability

3. Health

4. Environmental protection

5. Technical compatibility

6. Accessibility

1.1.2. The parameters involved in the wheel/rail contact must meet the stability requirements needed in order to guarantee safe movement at the maximum authorised speed. The parameters of brake equipment must guarantee that it is possible to stop within a given brake distance at the maximum authorised speed.

The monitoring and maintenance of fixed or movable components that are involved in train movements must be organised, carried out and quantified in such a manner as to maintain their operation under the intended conditions.

1.3.1. Materials likely, by virtue of the way they are used, to constitute a health hazard to those having access to them must not be used in trains and railway infrastructures.

1.4.2. The materials used in the trains and infrastructures must prevent the emission of fumes or gases which are harmful and dangerous to the environment, particularly in the event of fire.

The technical characteristics of the infrastructure and fixed installations must be compatible with each other and with those of the trains to be used on the rail system.

1.6.1. The ‘infrastructure’ and ‘rolling stock’ subsystems must be accessible to persons with disabilities and persons with reduced mobility in order to ensure access on an equal basis with others by way of the prevention or removal of barriers, and by way of other appropriate measures.

...are related to TSI parameters in chapters 4 and 5

TSI point	Title of TSI point	Safety	R&A	Health	Environmental protection	Tech. Compatibility	Accessibility
4.2.3	Voltage and frequency	—	—	—	—	1.5 2.2.3	—
4.2.4	Parameters relating to supply system performance	—	—	—	—	1.5 2.2.3	—
4.2.5	Current capacity, DC systems, trains at standstill	—	—	—	—	1.5 2.2.3	—
4.2.6	Regenerative braking	—	—	—	1.4.1 1.4.3	1.5 2.2.3	—

The technical characteristics of the infrastructure and fixed installations must be compatible with each other and with those of the trains to be used on the rail system. This requirement includes the safe integration of the vehicle's subsystem with the infrastructure.

The electricity/thermal energy-supply systems used must:

- enable trains to achieve the specified performance levels,
- in the case of electricity energy-supply systems, be compatible with the collection devices fitted to the trains.

The rolling stock and energy-supply systems must be designed and manufactured in such a way as to be electromagnetically compatible with the installations, equipment and public or private networks with which they might interfere.

What are Interoperability Constituents?

IOD Art. 2

‘Interoperability constituents’ means

- any elementary component, group of components, subassembly or complete assembly of equipment
- incorporated or intended to be incorporated into a subsystem,
- upon which the interoperability of the rail system depends directly or indirectly,
- including both tangible objects and intangible objects;

They are defined in each TSI

Good example of IC: the wheel

Clause 5.3.3 of WAG TSI

A wheel shall be **designed and assessed for an area of use** defined by:

- nominal tread diameter,
- maximum vertical static force,
- maximum speed,
- in-service limits, and
- maximum braking energy.



A wheel shall comply with the **requirements on geometrical, mechanical and thermo mechanical parameters** defined in point 4.2.3.6.3. These requirements shall be assessed at IC level.

Requirements really
assessable at IC level

Not much customization to
the subsystem

Bad example of IC: the display

Former point 5.3.2.7 of PRM TSI

- (1) Each station name (which may be abbreviated), or words of messages, shall be displayed for a minimum of 2 seconds.
- (2) If a scrolling display is used (either horizontal or vertical), each complete word shall be displayed for a minimum of 2 seconds and the horizontal scrolling speed shall not exceed an average of 6 characters per second.
- (3) The typeface used for texts shall be easily readable.
- (4) Upper Case Letters and numbers used in external displays shall have a minimum height of 70 mm on front displays and 35 mm on side displays.
- (5) Internal displays shall be designed and assessed for an area of use defined by the maximum viewing distance according to the following formula:

Requirements not
assessable at IC level

Table 13

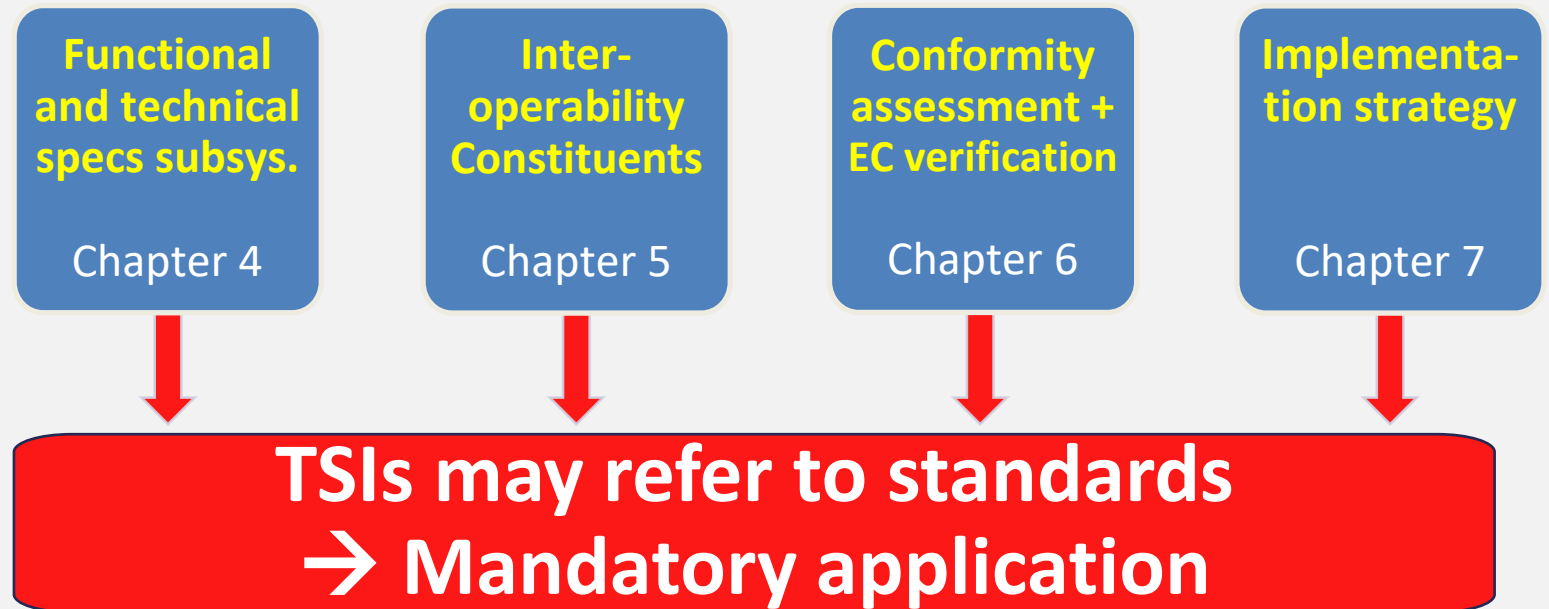
Area of use of the internal displays for rolling stock

Reading distance	Height of upper case letters and numbers
< 8 750 mm	(reading distance/250) mm
8 750 to 10 000 mm	35 mm
> 10 000 mm	(reading distance/285) mm

Need customization
to the subsystem

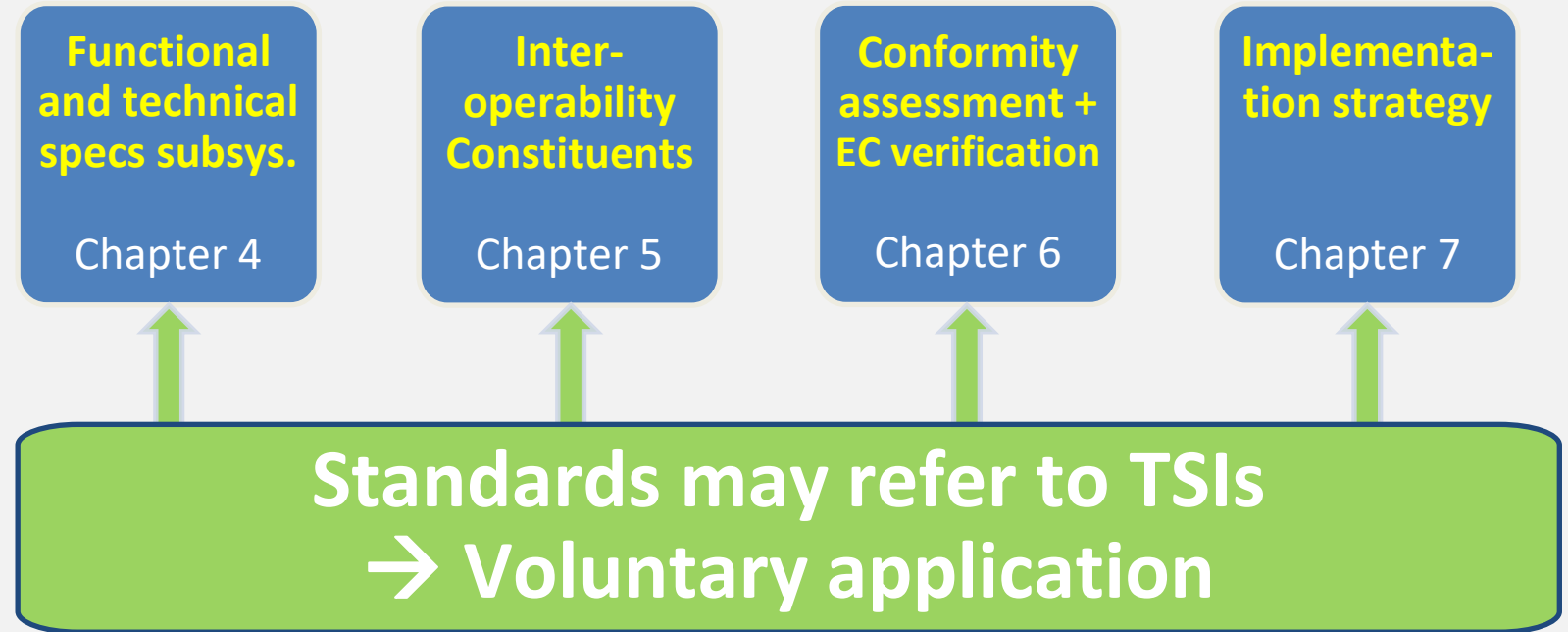
Reference to (harmonised) standards

*“TSIs may make an explicit, clearly identified reference to **European or international standards** or specifications or technical documents published by the Agency where this is strictly necessary in order to achieve the objectives of this Directive [...] “*
[Art. 4.8 IOD]



- Mandatory clauses of referenced standards are summarised in an Appendix of the TSI
(e.g. Appendix J in LOC PAS TSI and Appendix D in WAG TSI)

Reference from harmonised standards

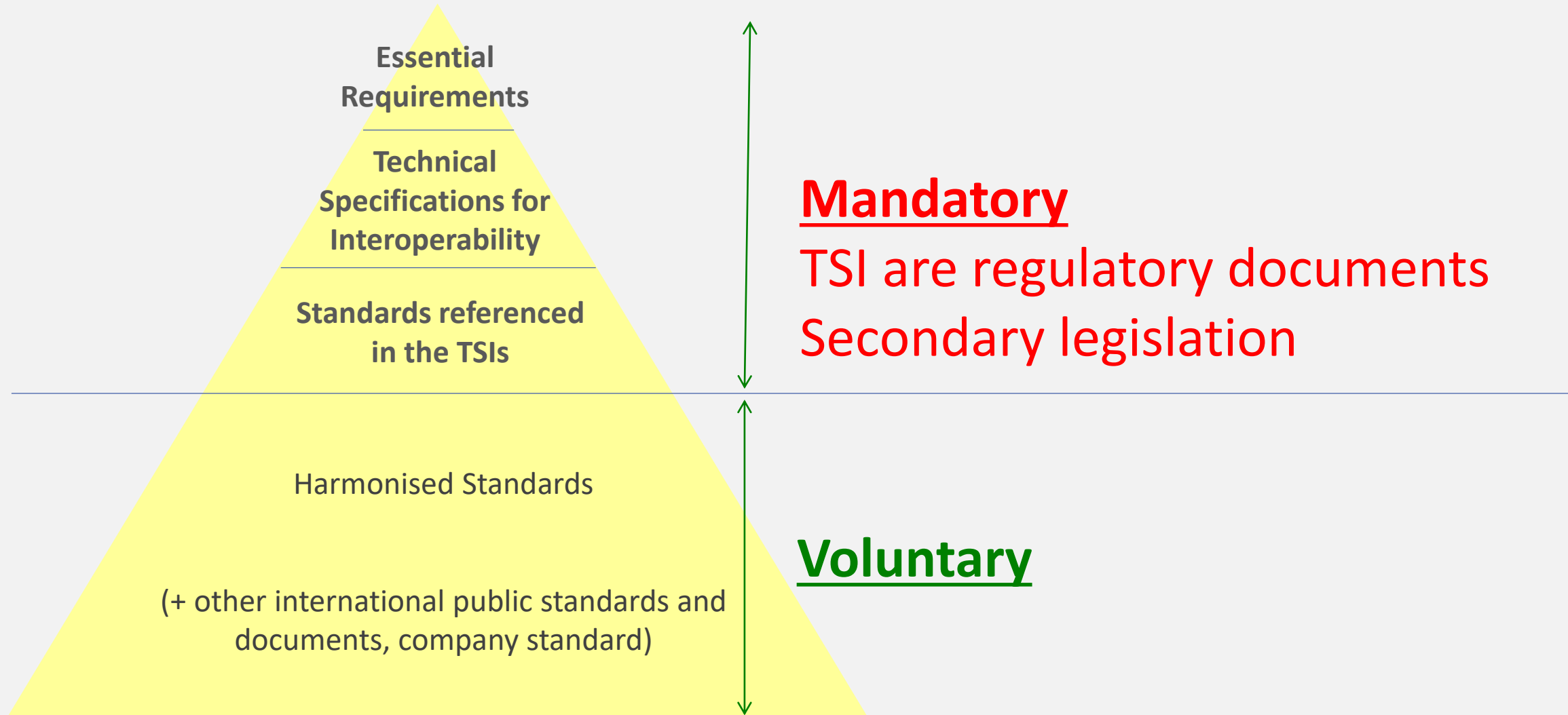


Note

TSI Application guides explain how TSIs may be applied and list voluntary standards giving presumption of conformity to TSI requirements.

- Voluntary harmonised standards may refer to TSI chapters when they give presumption of conformity to them (in addition to the mandatory clauses referred to in the TSIs). In this case their Annex ZA/ZZ shall reflect this.
- All harmonised standards are listed in the OJEU.

Case of standards



- TSIs aren't design guidelines but EU Regulations
- They cover both structural and functional subsystems of the railway system
- They prescribe the technical requirements applicable to subsystems and interoperability constituents necessary to:
 - meet essential requirements to the extent that the parameter is not addressed elsewhere,
 - deliver interoperability, and
 - deliver an optimum level of harmonisation
- TSIs are as concise as possible, as extensive as necessary
 - only technical aspects critical for interoperability
 - only functional requirements, no specific technical solutions
- TSIs may refer to (part of) EU standards, making them compulsory

Case of national rules

National rules

Essential
Requirements

Technical
Specifications for
Interoperability

Standards referenced
in the TSIs

Harmonised Standards

(+ other international public standards and
documents, company standard)

Mandatory

TSI are regulatory documents
Secondary legislation

Voluntary

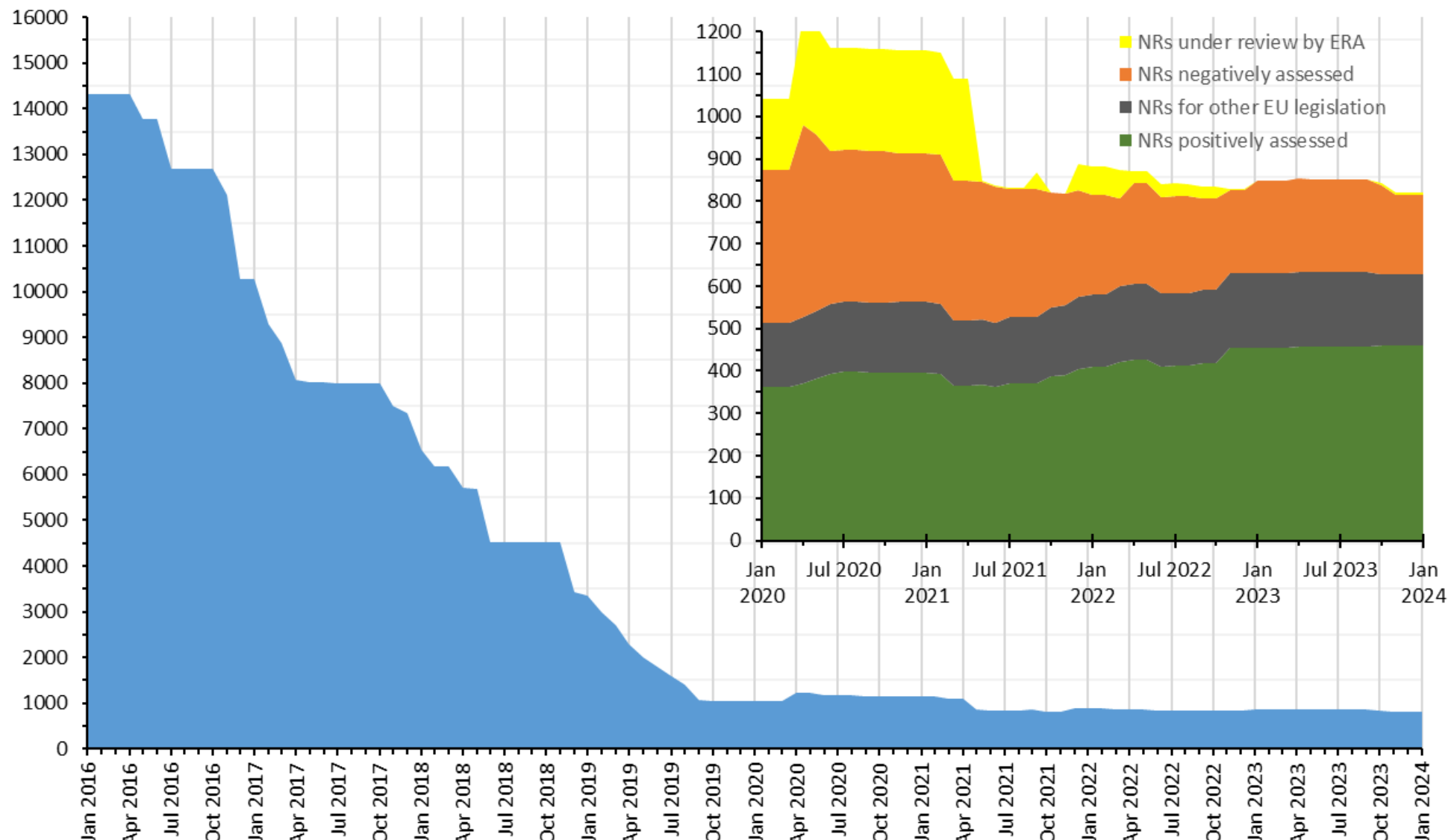
National rules for vehicle authorisation

- Existing national rules (art 13(2)) are limited to :
 - Where the TSIs do not cover(..) aspects corresponding to the essential requirements, including **open points**,
 - Specific cases listed but not described in TSIs,
 - Ensure technical compatibility with existing network,
 - Case where non-application of one or more TSIs or parts of them,
 - Vehicles not covered by TSIs,
 - Urgent temporary preventive measure (..) following an accident.
- New national rules may only be adopted article 14(4)) :
 - when a TSI does not fully meet the essential requirements;
 - as an urgent preventive measure, in particular following an accident.

National rules status

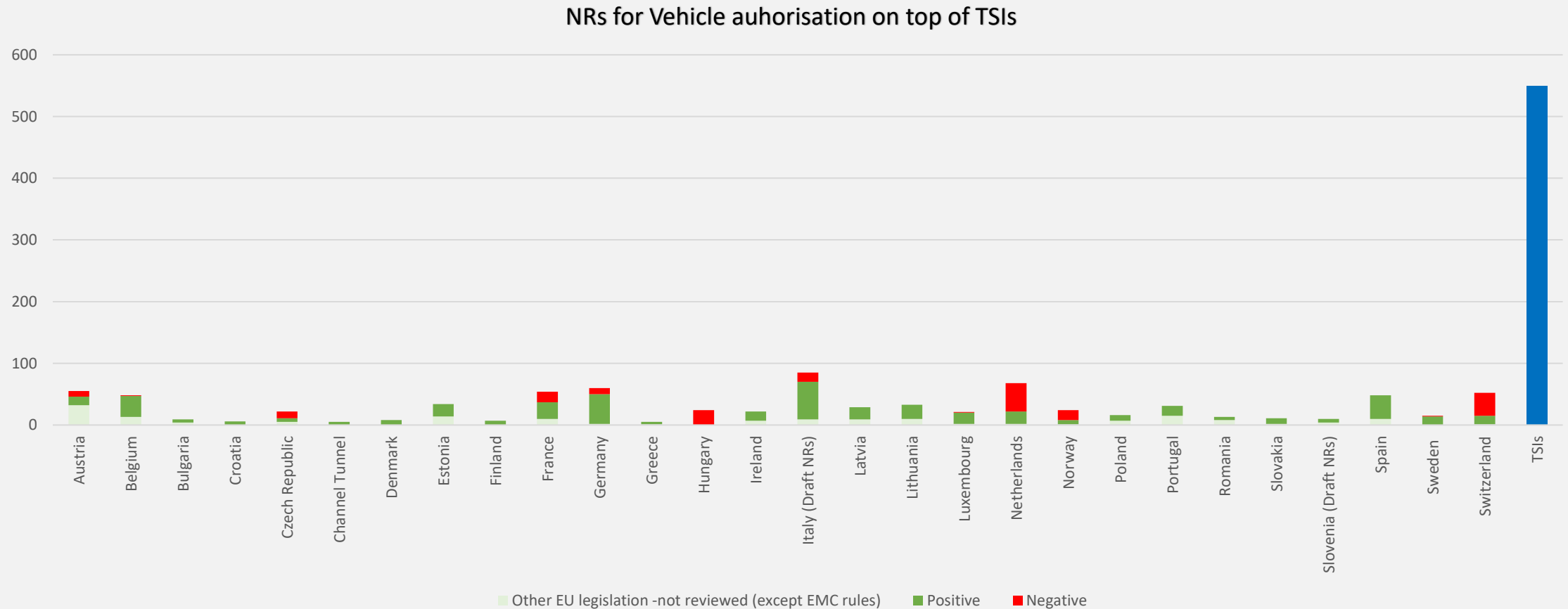
- From **16 June 2019** and pending the SRD, **RDD is the reference** for applicants, NSAs and the Agency in terms of applicable NRs for VA.
- When the evaluation of NRs leads to a negative assessment, the Agency addressed to the relevant MSs, a technical opinion.

NRs for VA on top of TSIs



National rules status

- Starting point : **13 459** (January 2016)
- Now : **821**(January 2024)





The TSI package 2023

A bundle of different documents

1. Commission Implementing Regulation (EU) 2023/1694 **amending** Commission Regulations (EU):
 - No 321/2013 (**WAG TSI**),
 - No 1299/2014 (**INF TSI**),
 - No 1300/2014 (**PRM TSI**),
 - No 1301/2014 (**ENE TSI**),
 - No 1302/2014 (**LOC&PAS TSI**),
 - No 1304/2014 (**NOI TSI**)
 - and Commission Implementing Regulation (EU) 2019/777 (**RINF**)
2. Commission Implementing Regulation (EU) 2023/1693 **amending** Implementing Regulation (EU) 2019/773 (**OPE TSI**)
3. Commission Implementing Regulation (EU) 2023/1695 **repealing** Regulation (EU) 2016/919 (**CCS TSI**)
4. Commission Implementing Decision (EU) 2023/1696 **amending** Implementing Decision 2011/665/EU (**ERATV**)

1. Adoption on 10 August 2023
2. Publication on 8 September 2023
3. Entry into force on **28 September 2023**

Documents available on ERA website

Consolidated versions available

Some key changes

1. Rolling Stock

- Unique authorisation of passenger coaches
- Derailment detection of freight wagons
- Noise assessment of composite brake blocks at IC level
- Codification of freight wagons used for combined transport
- Transition between TSIs and validity of types

2. Fixed installations

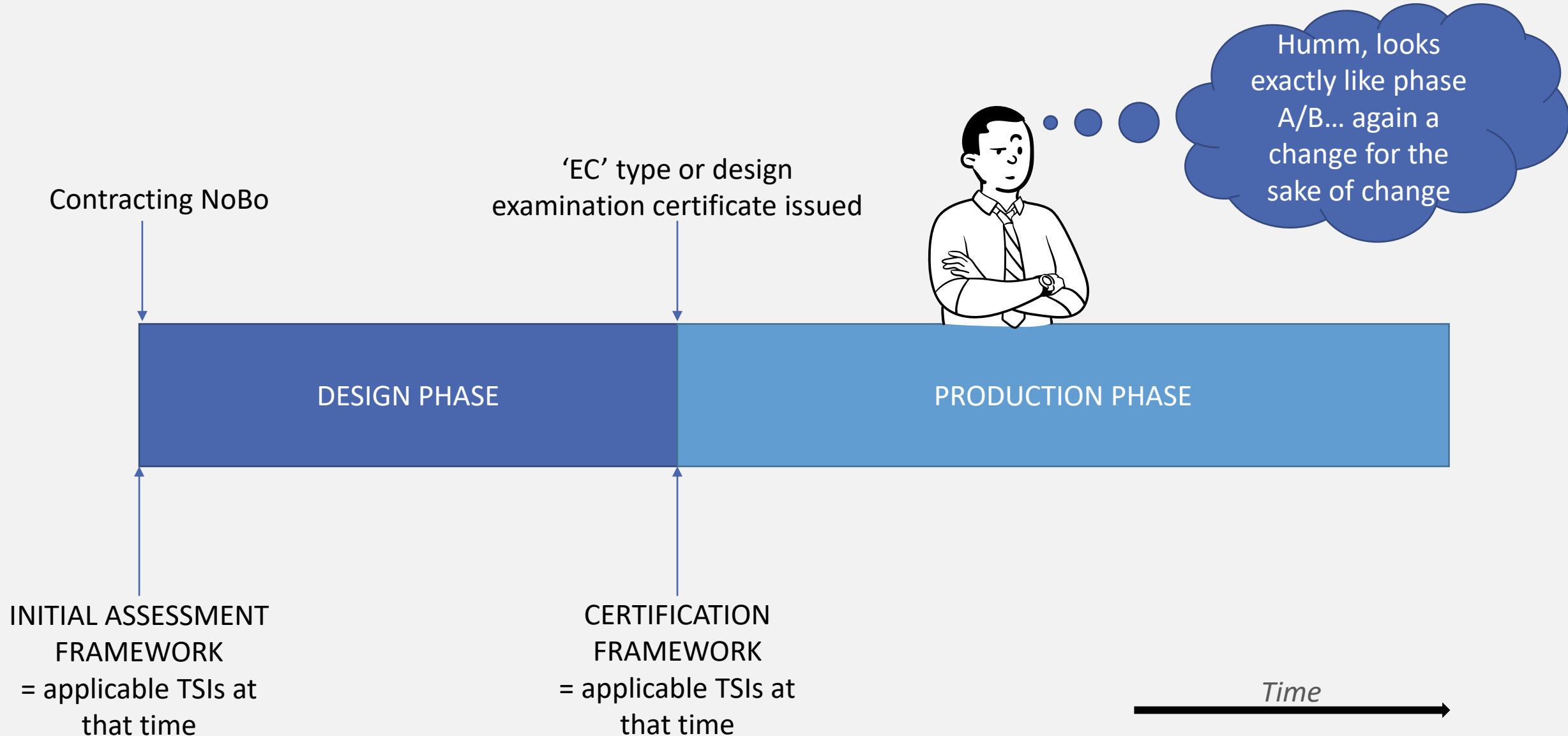
- TSI categories of lines
- Applicability of TSIs in case of upgrade/renewal
- Facilitation of the charging of traction batteries

3. Operation

- Communication between Railway Undertaking and Infrastructure Manager
- Operation of combined transport trains

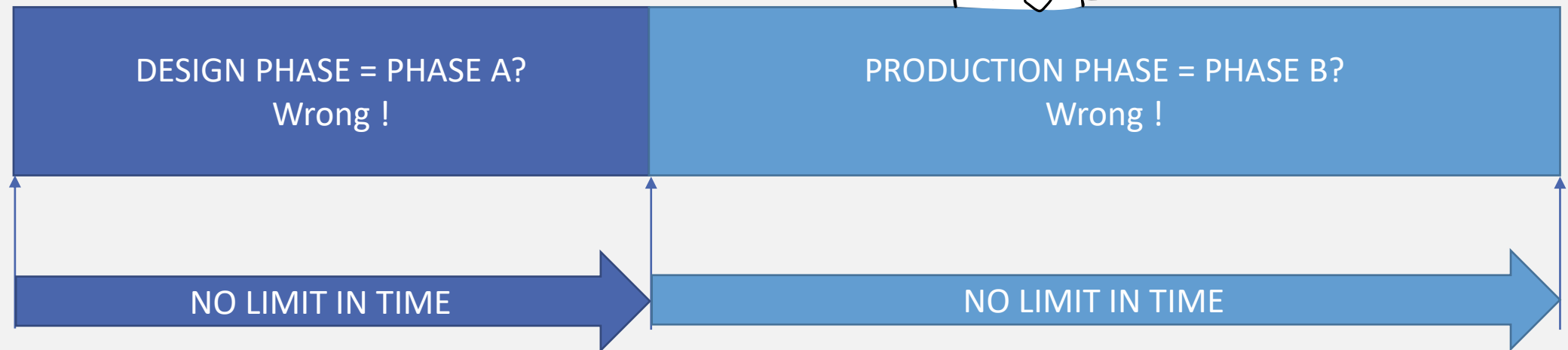
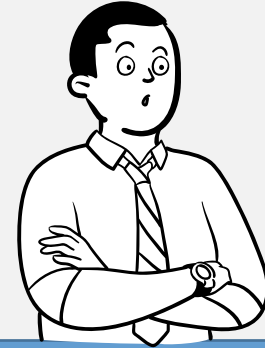
[WEBINARS AVAILABLE DETAILING THOSE CHANGES](#)

Focus on transition for rolling stock: Phases of a project

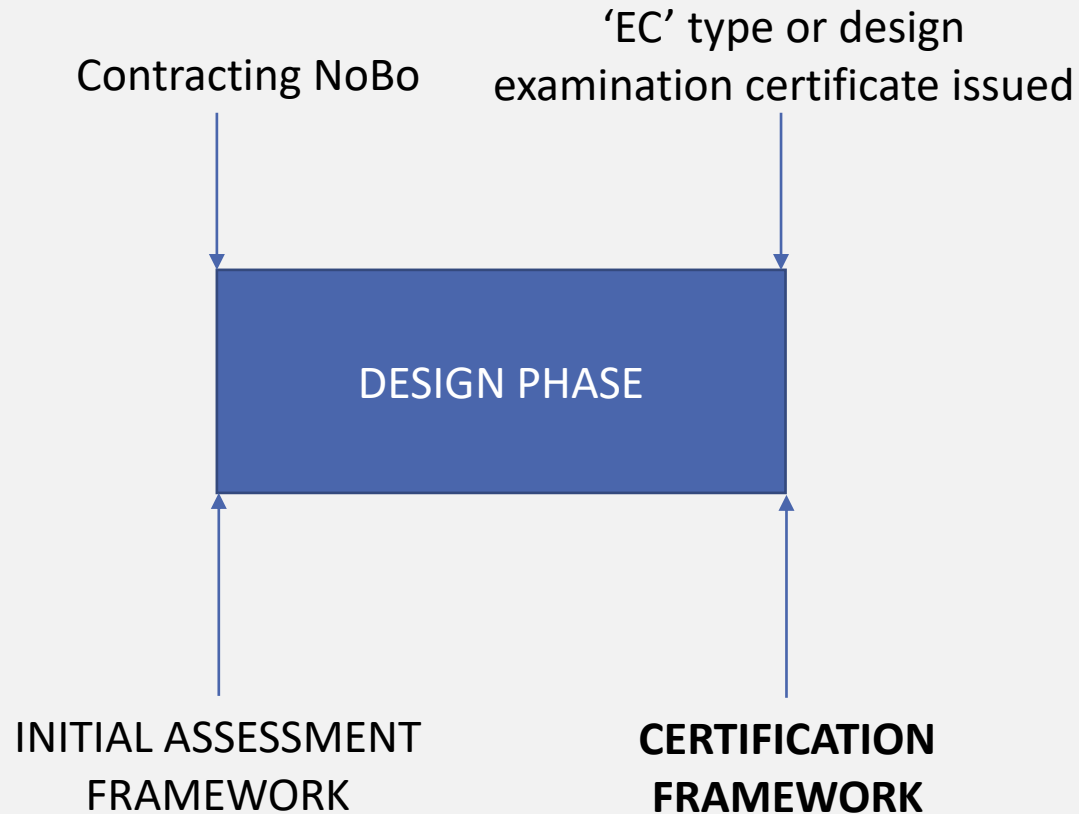


Why introducing new terms ?

1st change compared to phase A / phase B



Issuing the 'EC' type or design examination certificate 2nd change compared to phase A / phase B



The notified body shall issue the **EC type or design examination certificate** referring to the **certification framework**

Assessment according to the certification framework requires categorisation of TSIs changes

Essential statement in the TSIs:

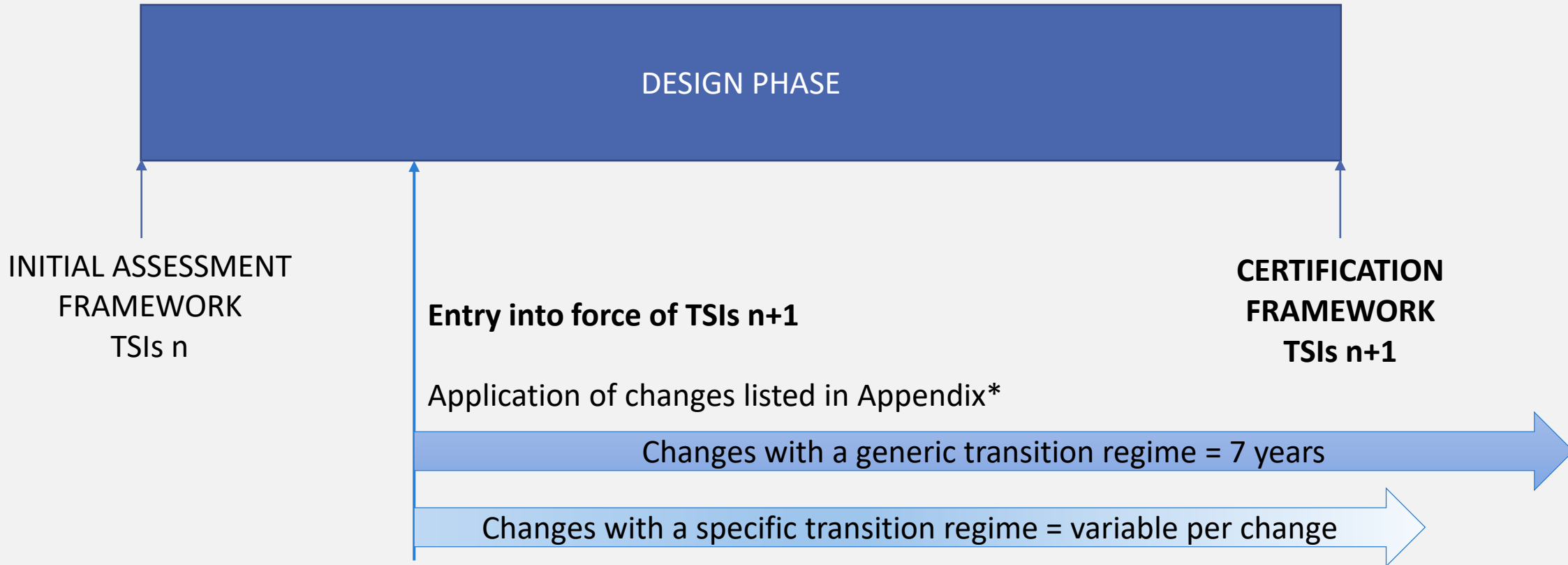
Compliance with the “previous TSI” is deemed equivalent to compliance with this TSI, except for changes listed in Appendix*.

Appendix* lists the changes made to the TSI and assigns a transition regime to each change:

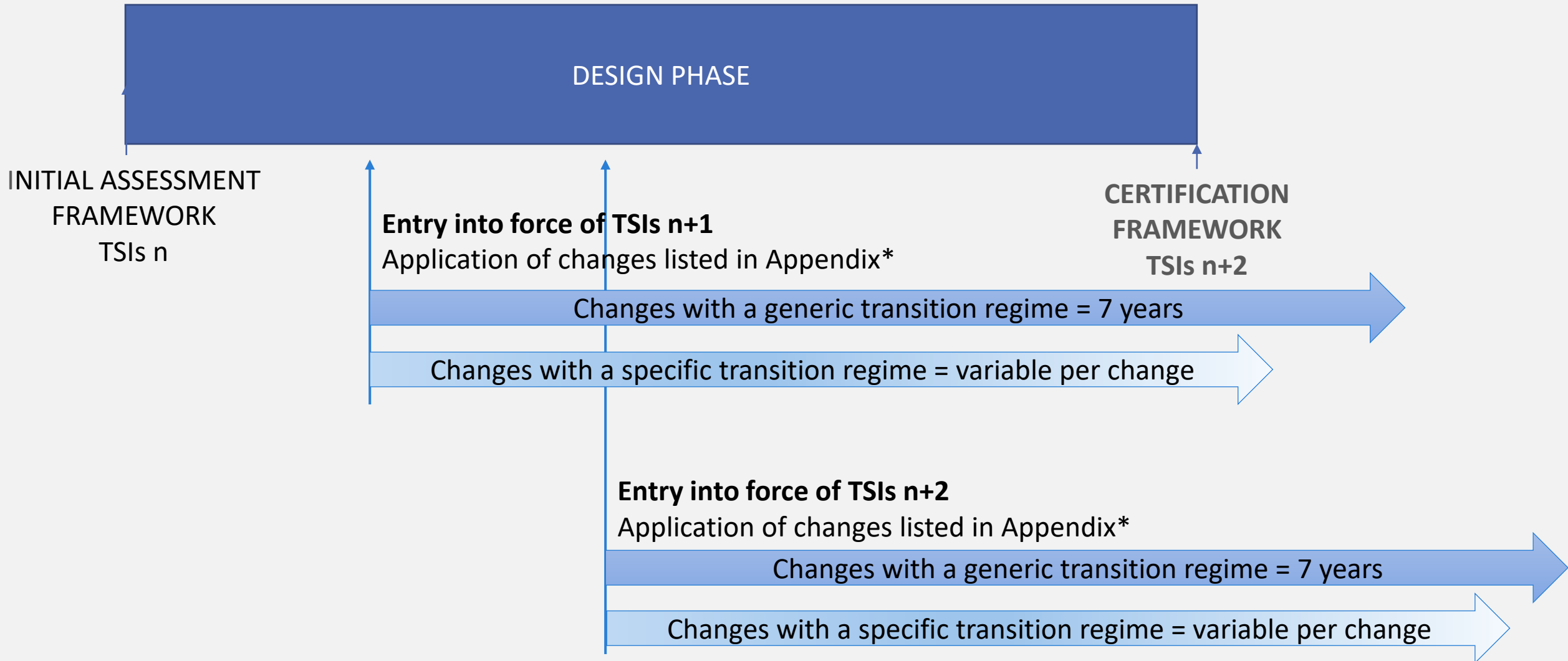
- Changes with a **generic transition regime** of 7 years
- Changes with a **specific transition regime**

** Appendix A in WAG TSI, B in CCS, L in LOC&PAS, P in PRM, H in NOI*

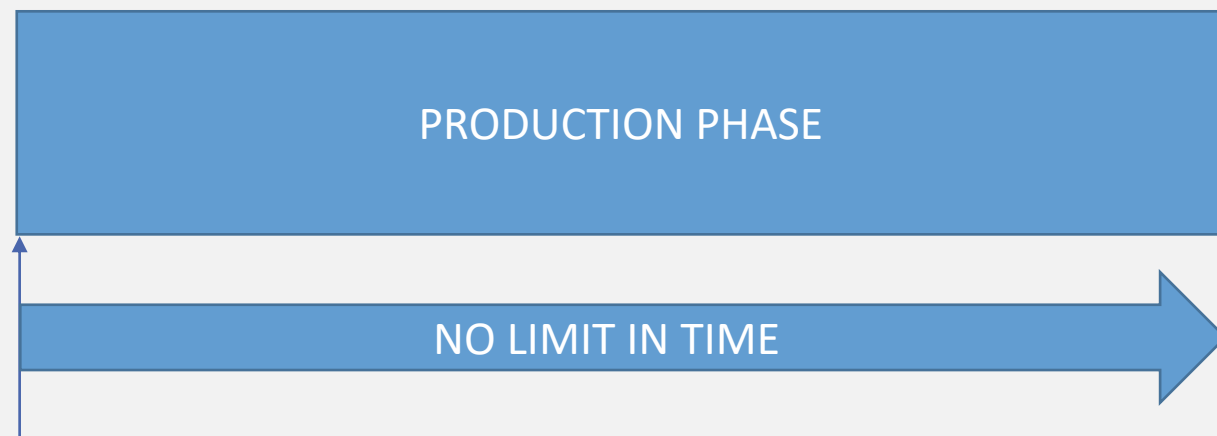
What happens when new TSIs enter into force during the design phase?



What happens when several new TSIs enter into force during the design phase?



Validity of the EC type or design examination certificate



Only the changes to the TSIs with a specific transition regime can apply to Rolling Stock in production phase or to Rolling Stock in operation and make a type invalid

Case of variants and versions

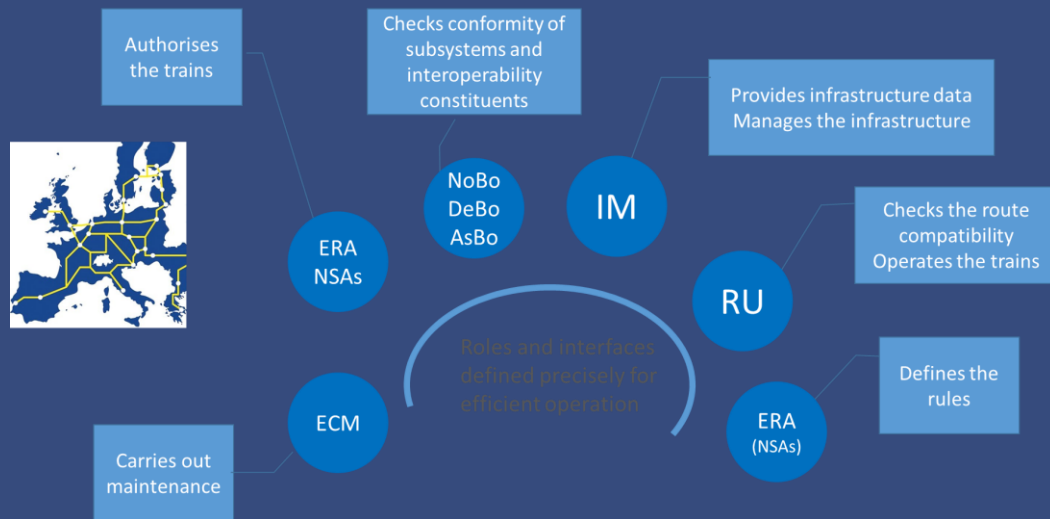
- A design phase can cover a type and one or several type variant(s) and type version(s).
- **For all type variant(s) and type version(s), the design phase is considered as starting at the same time as for the main type.**
 - This means that the Initial Assessment Framework of the variant/version is the same as for the main type

Questions?



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Role of different actors in the Railway System



- Actors (Applicants, ERA, NSA, CABs (Conformity Assessment Bodies) and other actors.
- Relation/interaction with different concerned parties in the railway sector

Some general philosophy (1)

The **manufacturer** is responsible for the conformity of product to applicable legislation.

The **user** is responsible to use the product in conformity with the applicable legislation.

The **authorities** have a duty of control on the conformity of products and their use to the applicable legislation. Two types of control:

- Control before the product is placed on the market = 'A priori'
- Control after the product is placed on the market = 'A posteriori'

Some general philosophy (2)

Control a priori by conformity assessment bodies and authorities

Control a posteriori by authorities

- Conformity assessment bodies
 - Notified Bodies (NoBo)
 - Designated Bodies (DeBo)
 - Assessment Bodies (AsBo)
- Authorities
 - National Safety Authorities
 - European Union Agency for Railways (ERA)
 - National Investigation Bodies (only control a posteriori)

Conformity assessment bodies

■ Notified Body - NoBo:

- Designated by a Member State and is recognised throughout Europe.
- Assess compliance with the TSIs
- Issues verification certificates and Technical file.

■ Designated Body - DeBo:

- Designated by a MS , national recognition
- Assess compliance with national rules.
- Issues verification certificate and Technical file.

■ Risk Assessment Body - AsBo:

- Assesses the risk assessment procedures implemented by the applicant.
- Issues Safety assessment report

Applicant of vehicle (type) authorisation

- Select Assessment Bodies and assessment modules : design, manufacturing including testing.
- Ensure that product meets all the essential requirements (TSIs, National rules, other EU law).
- Prepare application files:
 - pre-engagement (optional),
 - authorisation: mandatory documents accompanying the application for authorisation
- Select the authorizing entity
- Introduce its VA application in **One Stop Shop**
- Sign risk declaration and EC declaration of verification of the subsystems
- Become the holder of the issued vehicle type authorisation

NSA / ERA in Vehicle authorisation

- Checks the documents accompanying the application for authorisation and provides proof of the adequacy of the verification procedure.
- This verification consists of checking the completeness, relevance and consistency of the file submitted. It is not :
 - a systematic in-depth verification of the work carried out by the applicants and the assessment bodies
 - a duplication of what has already been checked by the assessment bodies.
 - The NSA or ERA may only question the verifications carried out by the assessment bodies in the event of justified doubts...
- Issues the Authorisation of placing the Vehicle on the Market

NSA / ERA in Vehicle authorisation

- In case the area of use covers more than one Member State, ERA issues the authorisation after :
 - ERA : Manage the project, assess application against the TSIs and deliver the APM,
 - NSA : assess the **part related to national rules**.
- Authorisation issued mentions:
 - Area of use
 - Values of TSIs and NRs parameters related to Technical compatibility between the vehicle and the networks of the Area of use
 - Compliance with the TSIs and National rules,
 - Conditions for uses and other restrictions

Infrastructure Manager in Vehicle authorisation

- **The IM plays no role in the authorisation of placing on the market**
- The IM is involved in providing access to the network whenever tests are necessary to provide evidence of compliance

Questions?



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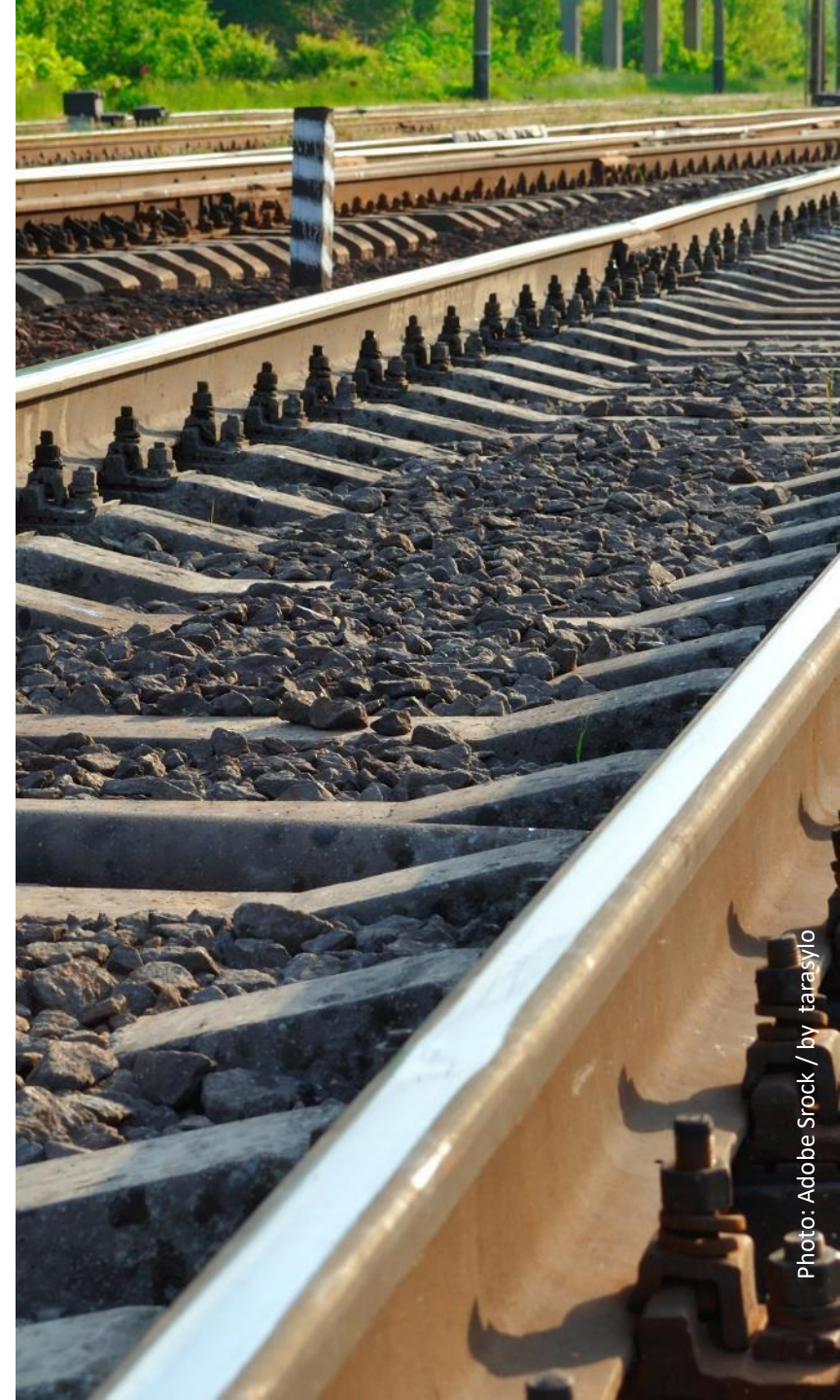
Interoperability – certification (IC and Subsystems, OTM)



- Focus on the process of certification for interoperability constituents and subsystems including OTMs.



EC verification procedure



EC verification procedure

- EC verification covers the compliance of the subsystem(s) to all essential requirements:
 - TSIs, National rules, Safety assessment report;
 - Other requirements needed.
- Applicant :
 - Performs the EC verification procedure for the subsystem(s);
 - Responsible for ensuring the subsystem(s) compliance with other applicable legal acts of the Union and any verifications by the assessment bodies required by the other rules;
 - Establish the EC Declaration of Verification;
 - EC Declarations of Verification including accompanying technical files are part of the application (Annex I 18.5 of 2018/545 – IA VA);
 - No need for national declaration.

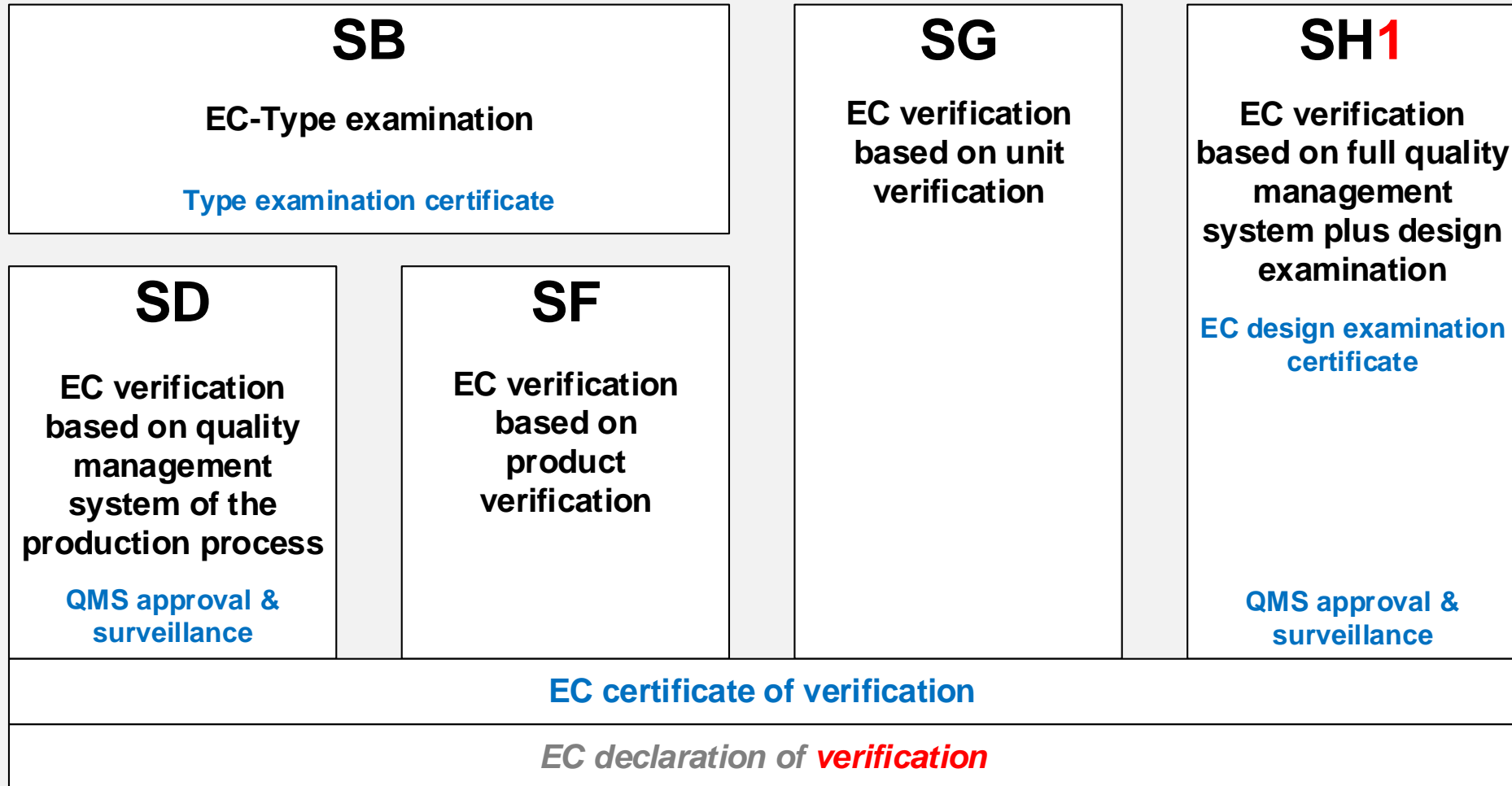
EC verification procedure

Assessment modules

- EC Verification procedure is based on application of assessment Modules.
- Modules :
 - Are described in decision 2010/713/EC;
 - Cover procedures for conformity assessment (ICs) and EC verification (subsystems);
 - Define responsibilities of participants in the procedures: Manufacturer, applicant, notified body etc.
 - Specify documents necessary to attest conformity.

EC verification procedure

Modules for subsystem



Documents issued by notified bodies

Documents issued by **applicant**

(contracting entity or **manufacturer**)

EC verification procedure

Assessment modules

- TSIs specify the application of modules in **chapter 6**;
- Some modules can be used only in combination with others, they may involve third party assessment (NoBo) or self-assessment (modules CA, CC).

Example:

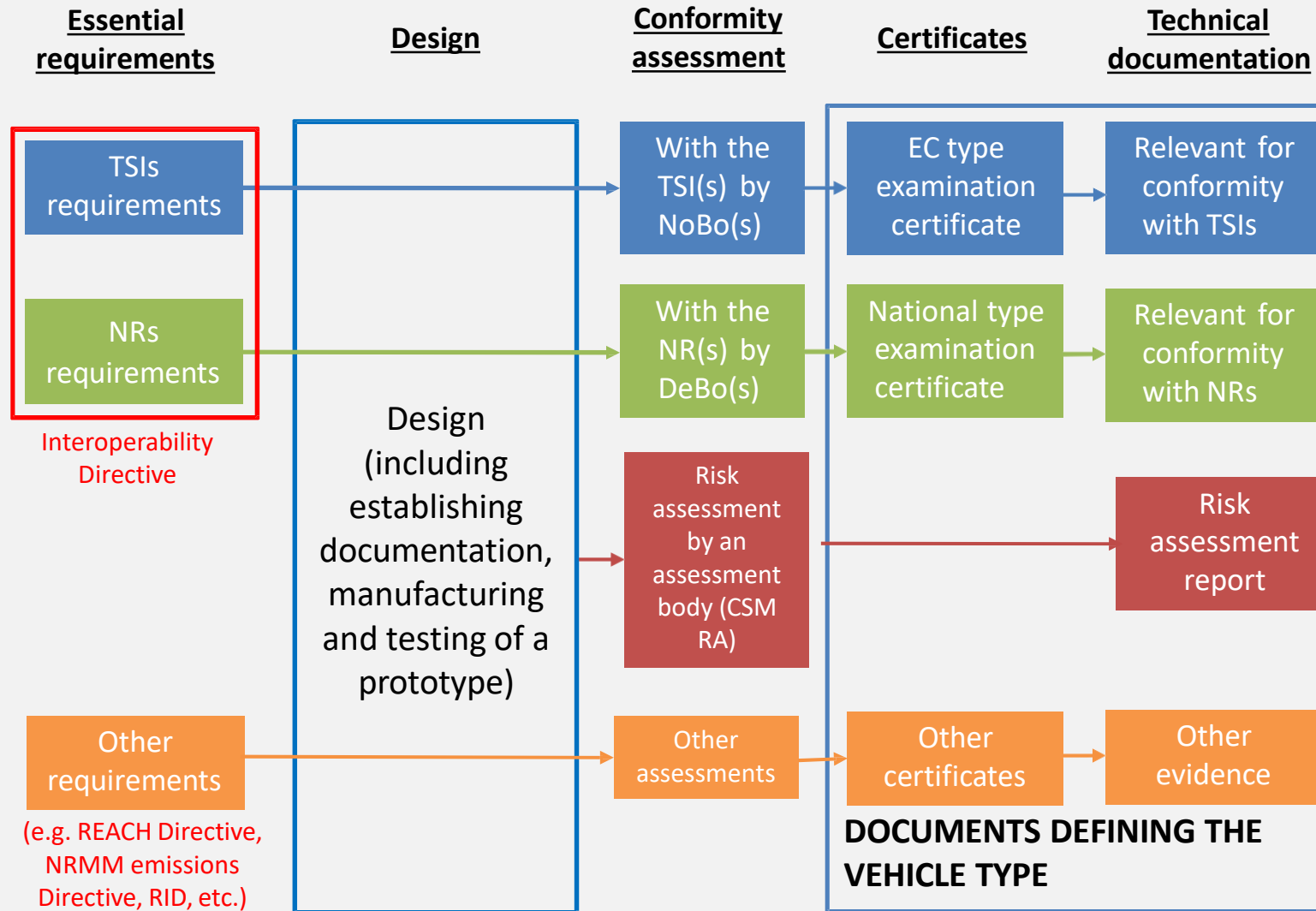
- TSI Loc&Pas 1302/2014 for ICs (Eg. For coupler):

Point	Constituents to be assessed	Module CA	Module CA1 or CA2	Module CB + CC	Module CB + CD	Module CB + CF	Module CH	Module CH1
5.3.1	Automatic centre buffer coupler		X (*)		X	X	X (*)	X
5.3.2	Manual end coupling		X (*)		X	X	X (*)	X

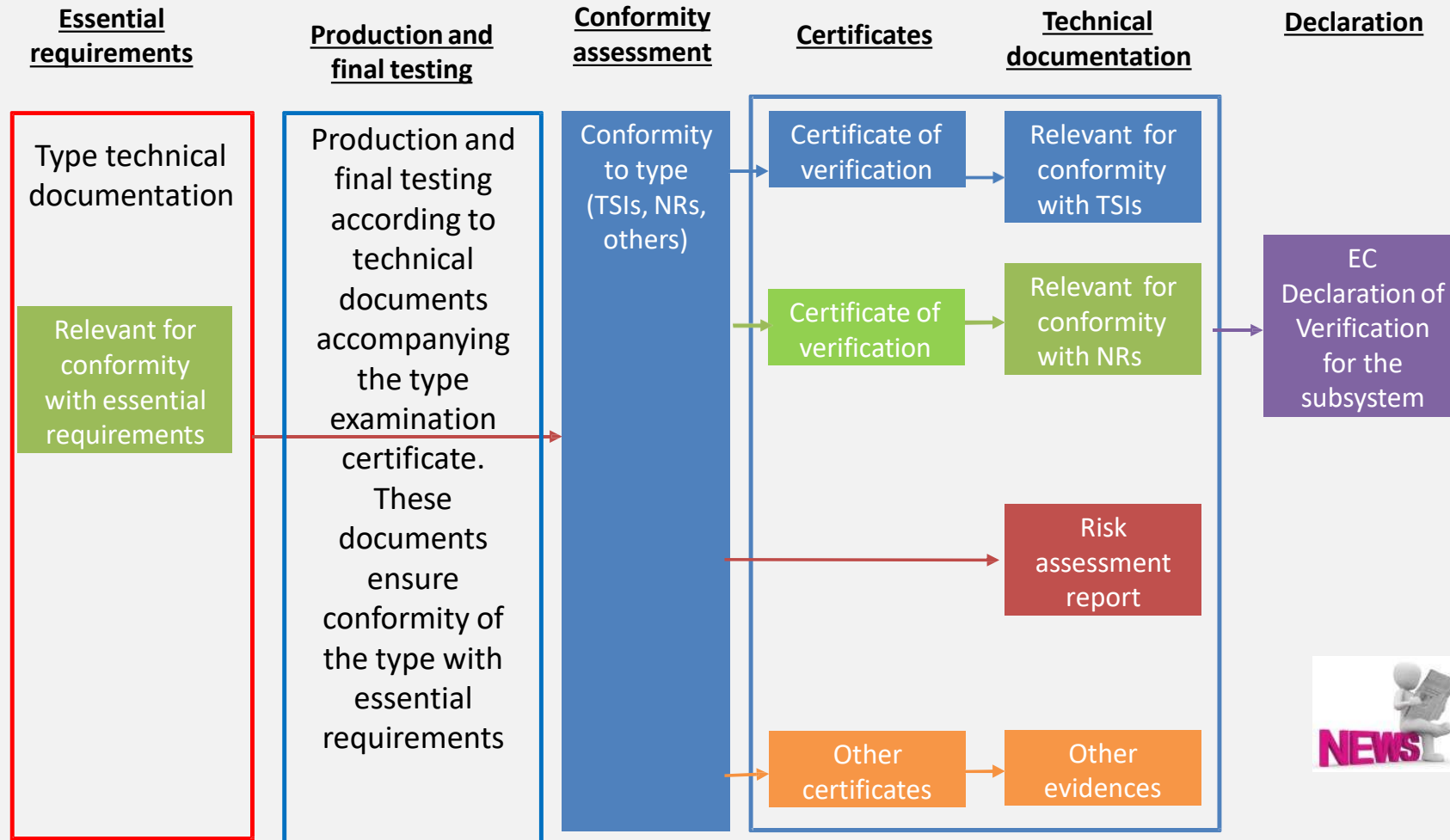
- TSI Loc&Pas 1302/2014 for subsystem (RST):

Applicant chooses one combination of modules : (SB+SD) or (SB+SF) or (SH1). The assessment is done according to the combination of modules chosen.

EC verification procedure for subsystem



EC verification procedure

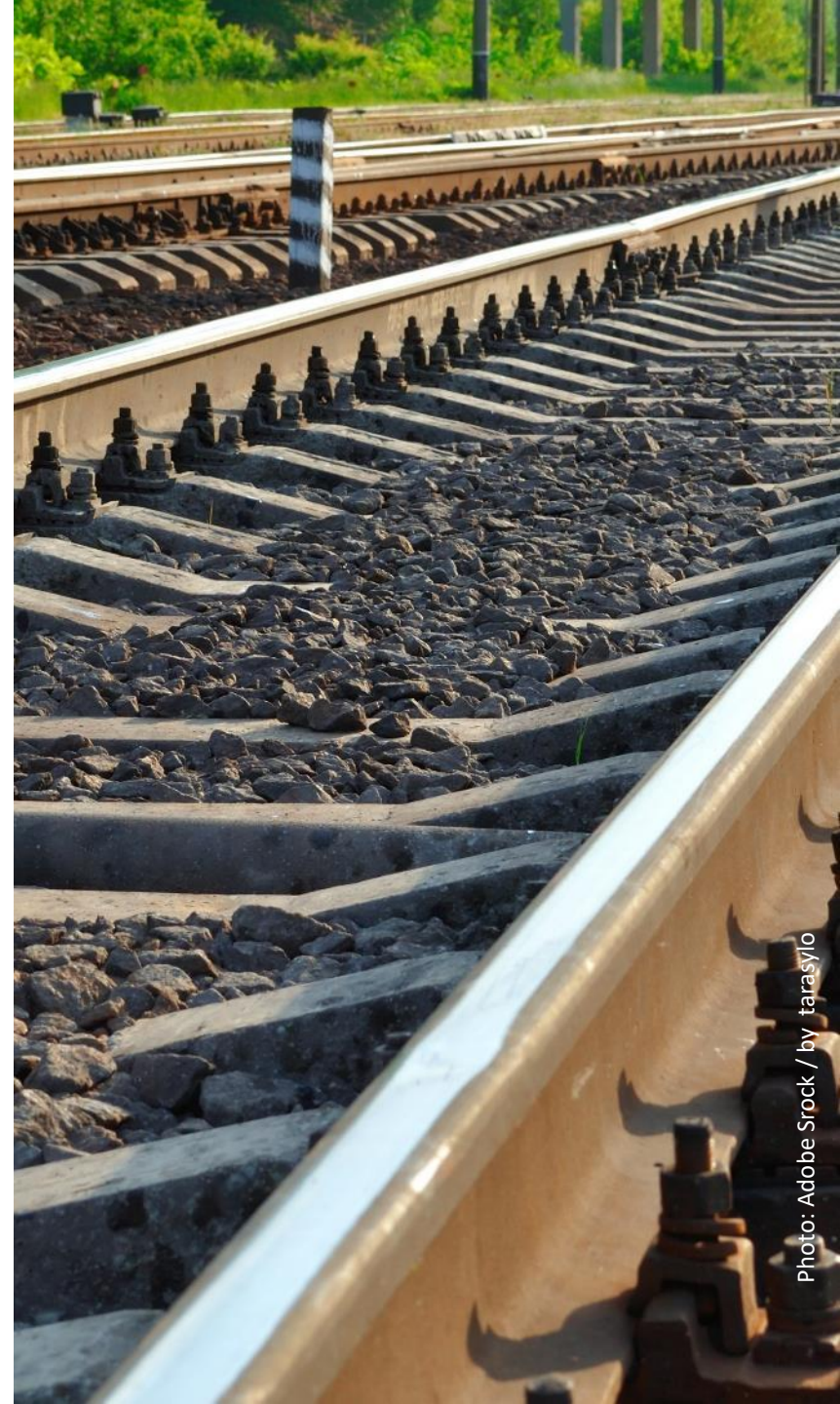
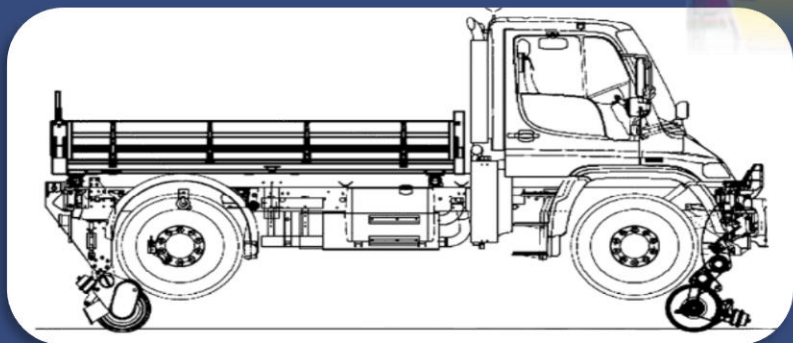


Questions?



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Special Vehicle such as OTM



Special vehicles such as OTMs

LOC&PAS 2.2.2(C)

TSI amendment 2023 introduce definitions of special vehicles:



- **On Track Machines:** designed for construction and maintenance of the track and infrastructure.



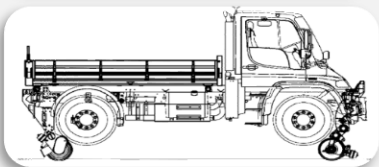
- **Infrastructure Inspection Vehicles:** monitor the condition of the infrastructure.



- **Environment vehicles:** designed for clearance of the track from environmental conditions.



- **Emergency vehicles:** designed for specific emergency use such as evacuation, firefighting, and recovery of trains.



- **Road-Rail vehicles:** self-propelled machines able to move on rails and on the ground.

Special vehicles such as OTM: How TSIs apply?

LOC&PAS 2.3.1 / WAG TSI 7.1

- **In the scope of RST TSIs when :**
 - running on its own rail wheels (in running mode self-propelled or hauled), and
 - intended to be detected by a track-based train detection system.
- **For hauled special vehicle:**
 - Applicant can apply either the **WAG TSI** or the **LOC&PAS TSI** depending on the characteristics and the intended use of the vehicle in question in comparison with the technical scope of the respective TSIs.
- **Not in the scope of RST TSIs:**
 - Special vehicles in **working mode, travelling mode.**
 - **Road-Rail** vehicles.



Special vehicles such as OTM: How TSIs apply?

LOC&PAS 7.1.1.3 / NOI

- **Area of use of more than one MS(7.1.1.3(1)):**
 - Compliance with **TSI LOC&PAS** and the **TSI NOI** is **mandatory** .
 - Transition regime of 7 Years (table L1)
- **Area of use of one MS (7.1.1.3(2), 7.1.1.3(3)):**
 - Compliance with **TSI LOC&PAS** and **TSI NOI** (except for assessment of the driver's cab interior noise level) is **not mandatory**:
 - Applicant may decide to apply TSIs.
 - Applicant may apply **NRs** as regards the basic parameters of TSIs with following conditions:
 - If NRs “different to TSIs” **do not exist**, compliance with **TSIs is mandatory**.
 - If NRs “cover partially TSIs parameters”, the application of TSIs is **mandatory for parameters not covered**. NoBo delivers certificate limited to parameters assessed.
 - If NRs “different to TSIs exist”, special vehicle may be authorised against NRs.



Special vehicles such as OTM: TSI NOI application

LOC&PAS 7.1.1.3 / NOI

- **TSI NOI is mandatory** when AoU is **more than one MS**.
- **TSI NOI is not mandatory** when special vehicle comply **only with NRs** as allowed in 7.1.1.3(2) **except for** assessment of the driver's cab interior noise level as referred in point 4.2.4 of TSI NOI:
 - Table 5 of TSI NOI provides Limit values for driver's cab interior noise.
 - These limit values **are not mandatory** for special vehicles. However, the demonstration of conformity referred to in point 6.2.2.4 shall be **performed** and the **resulting values shall be recorded in the technical file**.



How my ongoing projects may be impacted by point 7.1.1.3(1) ?

LOC&PAS 7.1.1.3

Application to ongoing projects :

As defined in table L1, compliance with the previous TSI does not imply compliance with the version of this TSI:

- Projects already in **design phase** shall comply with the requirement of this TSI from the date of entry into force of this **TSI + 7 years**.
- Projects in **production phase and rolling stock in operation** are **not affected** by the TSI requirements listed in Table L.1.

For special vehicle where national rules were applied instead of TSIs, the **design phase** is the period starting once a **DeBo** is contracted by the applicant and ending when the certificate of verification is issued.



NEWS

What happens in case of extension of AoU?

LOC&PAS 7.1.1.3

- **Case of Extension of area of use :**
 - When a special vehicle will have its area of use extended, the applicant can also decide to use NRs instead of the applicable TSI requirements **if for the previous authorisation it also decided to apply NRs.**



Questions?



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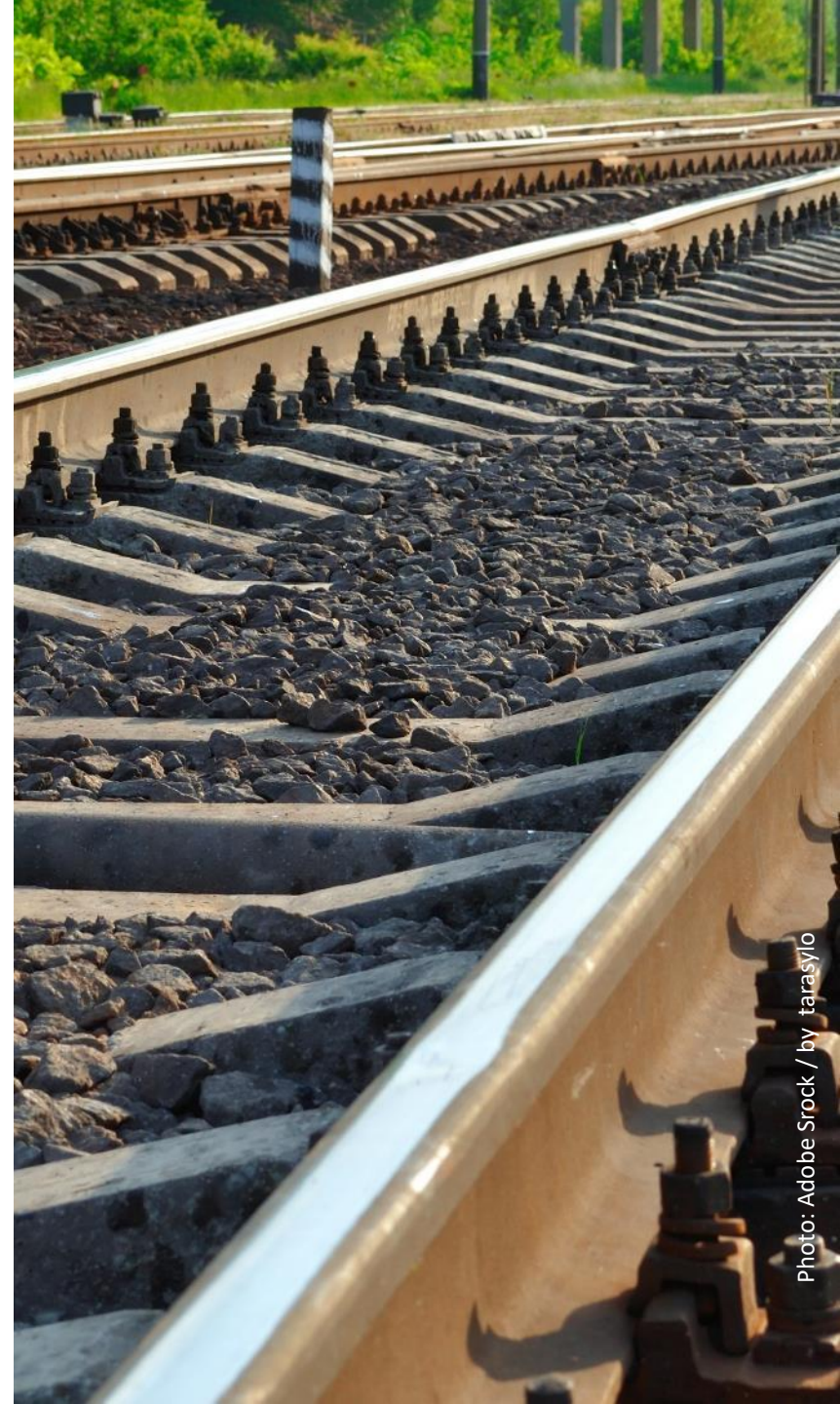
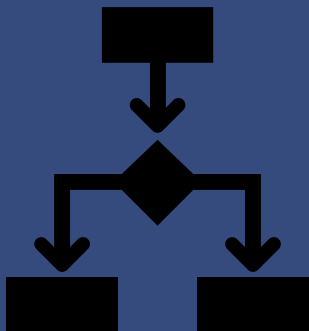
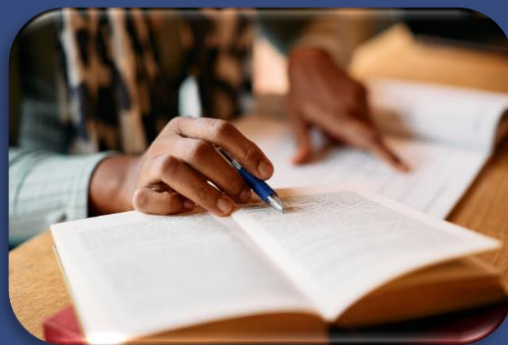


4RP – Vehicle Authorisation

- Quick summary of the vehicle authorisation process :
 - General aspects
 - Modification of vehicles
 - Extension of area of use
- Other VA aspects



VA process



We'll be talking about...



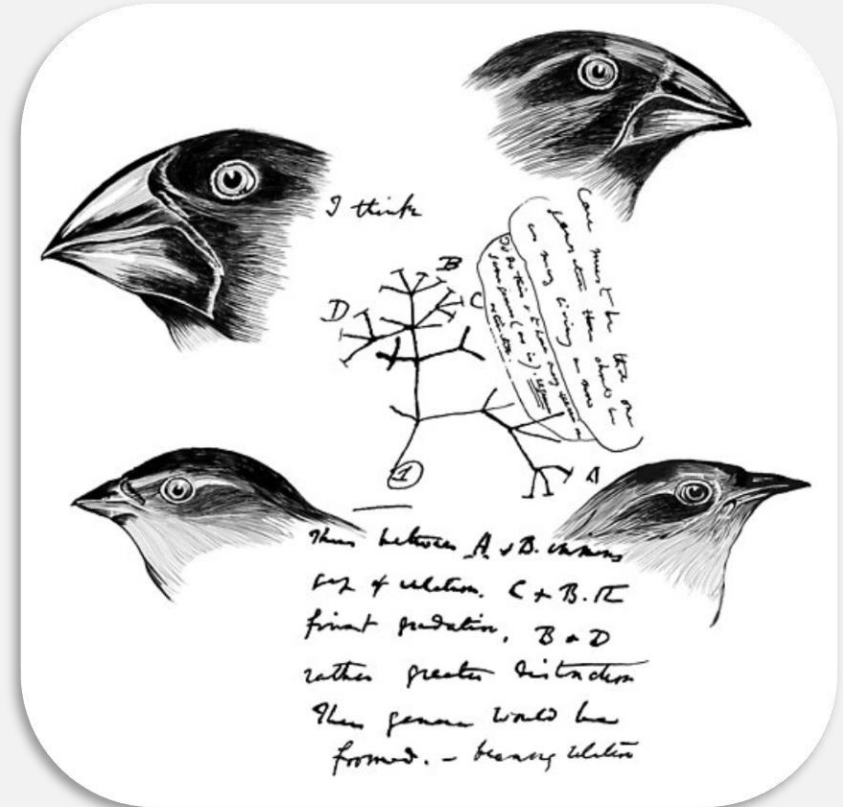
AUTORISATION OF PLACING ON THE
MARKET



AREA OF USE OF A VEHICLE



We'll be talking about...





OSS, ERATV, ERADIS
VA Toolbox

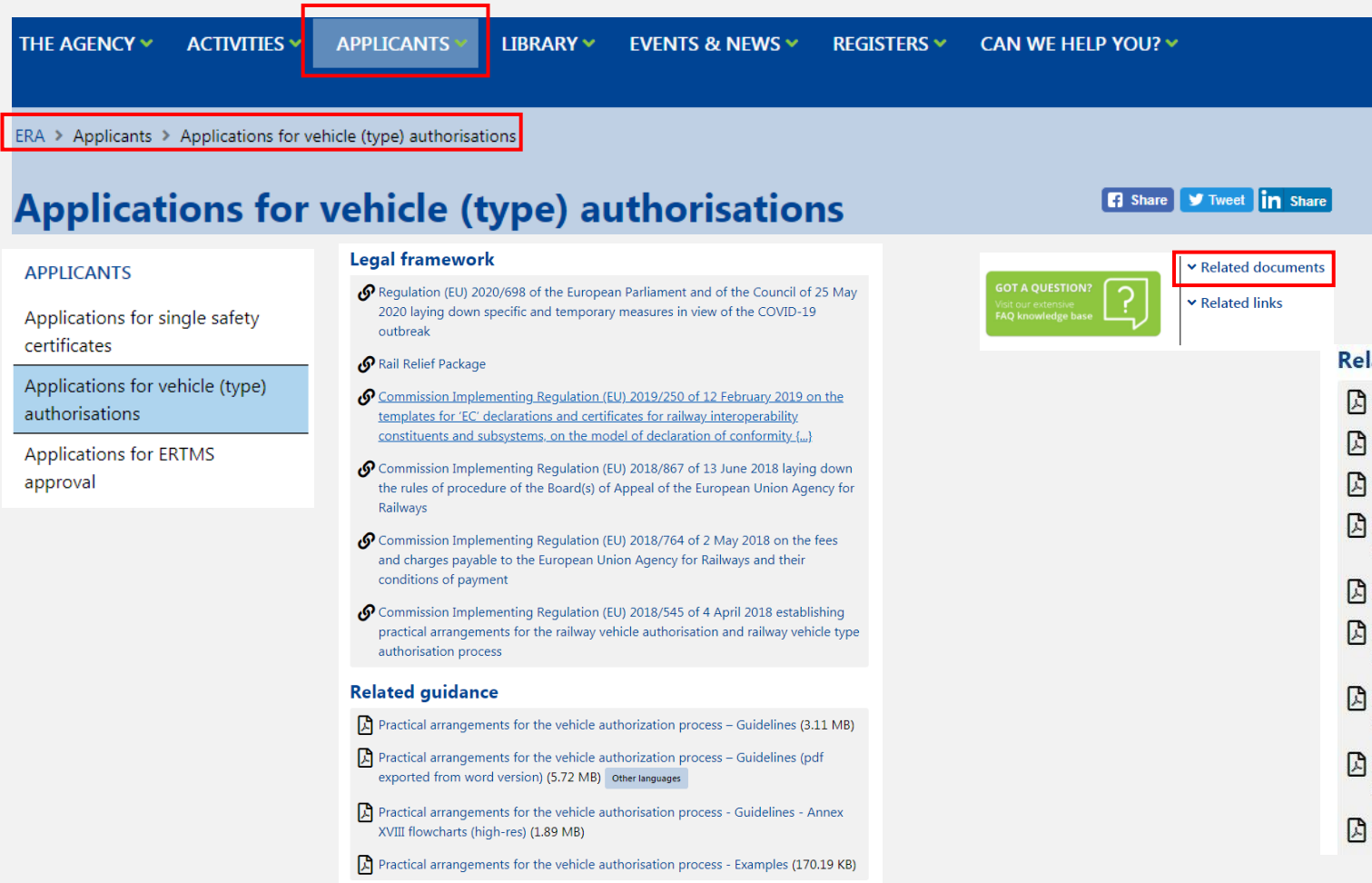
We'll be talking about...



THE ROLES AND RESPONSIBILITIES
OF THE 'USUAL SUSPECTS

Where to find the VA documents in ERA website

https://www.era.europa.eu/applicants/applications-vehicle-type-authorisations_en



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ERA > Applicants > Applications for vehicle (type) authorisations

Applications for vehicle (type) authorisations

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APPLICANTS

- Applications for single safety certificates
- Applications for vehicle (type) authorisations**
- Applications for ERTMS approval

Legal framework

- Regulation (EU) 2020/698 of the European Parliament and of the Council of 25 May 2020 laying down specific and temporary measures in view of the COVID-19 outbreak
- Rail Relief Package
- Commission Implementing Regulation (EU) 2019/250 of 12 February 2019 on the templates for 'EC' declarations and certificates for railway interoperability constituents and subsystems, on the model of declaration of conformity, (...)
- Commission Implementing Regulation (EU) 2018/867 of 13 June 2018 laying down the rules of procedure of the Board(s) of Appeal of the European Union Agency for Railways
- Commission Implementing Regulation (EU) 2018/764 of 2 May 2018 on the fees and charges payable to the European Union Agency for Railways and their conditions of payment
- Commission Implementing Regulation (EU) 2018/545 of 4 April 2018 establishing practical arrangements for the railway vehicle authorisation and railway vehicle type authorisation process

Related guidance










- Practical arrangements for the vehicle authorization process – Guidelines (3.11 MB)
- Practical arrangements for the vehicle authorization process – Guidelines (pdf exported from word version) (5.72 MB) [Other languages](#)
- Practical arrangements for the vehicle authorisation process - Guidelines - Annex XVIII flowcharts (high-res) (1.89 MB)
- Practical arrangements for the vehicle authorisation process - Examples (170.19 KB)

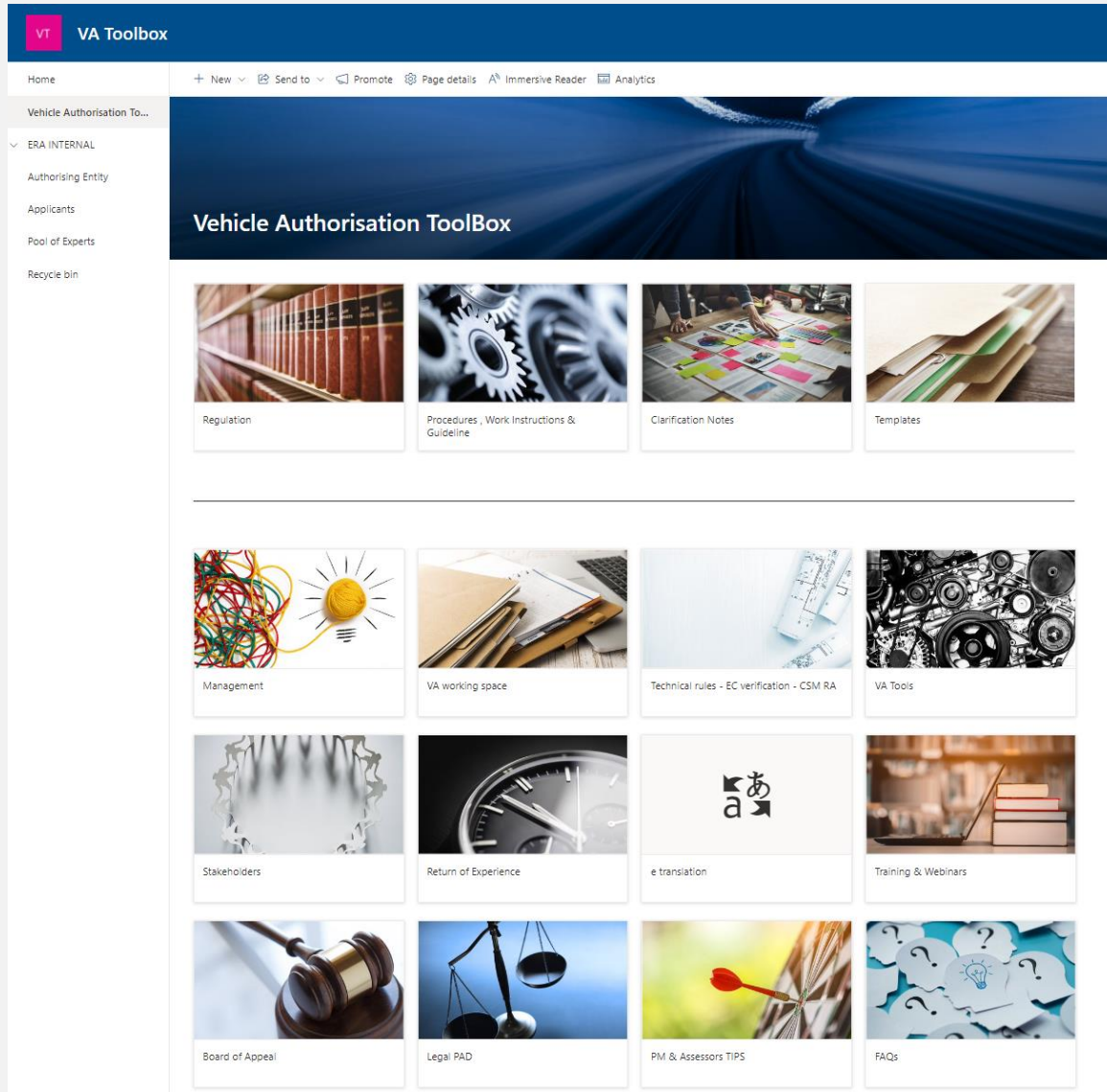
GOT A QUESTION?
Visit our extensive FAQ knowledge base

▾ Related documents
▾ Related links



Related documents

-  OSS User Guide for Applicants (4.72 MB)
-  Overview of applicable legal framework (VA) (247.9 KB)
-  OSS Training guidelines (232.1 KB)
-  ERA1209-001 Clarification about points 18.4 and 18.5 of Annex I of Regulation 2018-545.pdf (186.32 KB)
-  ERA1209-003 Clarification about responsibilities for populating ERADIS (131.89 KB)
-  ERA1209-006 Clarification about transitory measure for the uploading of EC Certificates and ISV information to ERADIS (225.16 KB)
-  ERA1209-036 Clarification about applicability of phase A in LOCPAS and WAG TSI for extension of the area of use (139.17 KB)
-  ERA1209-037 Clarification about the case to apply for changes (not extension) in the area of use (482.1 KB)
-  ERA1209-063 Clarification note on safe integration (1.13 MB) [Other languages](#)

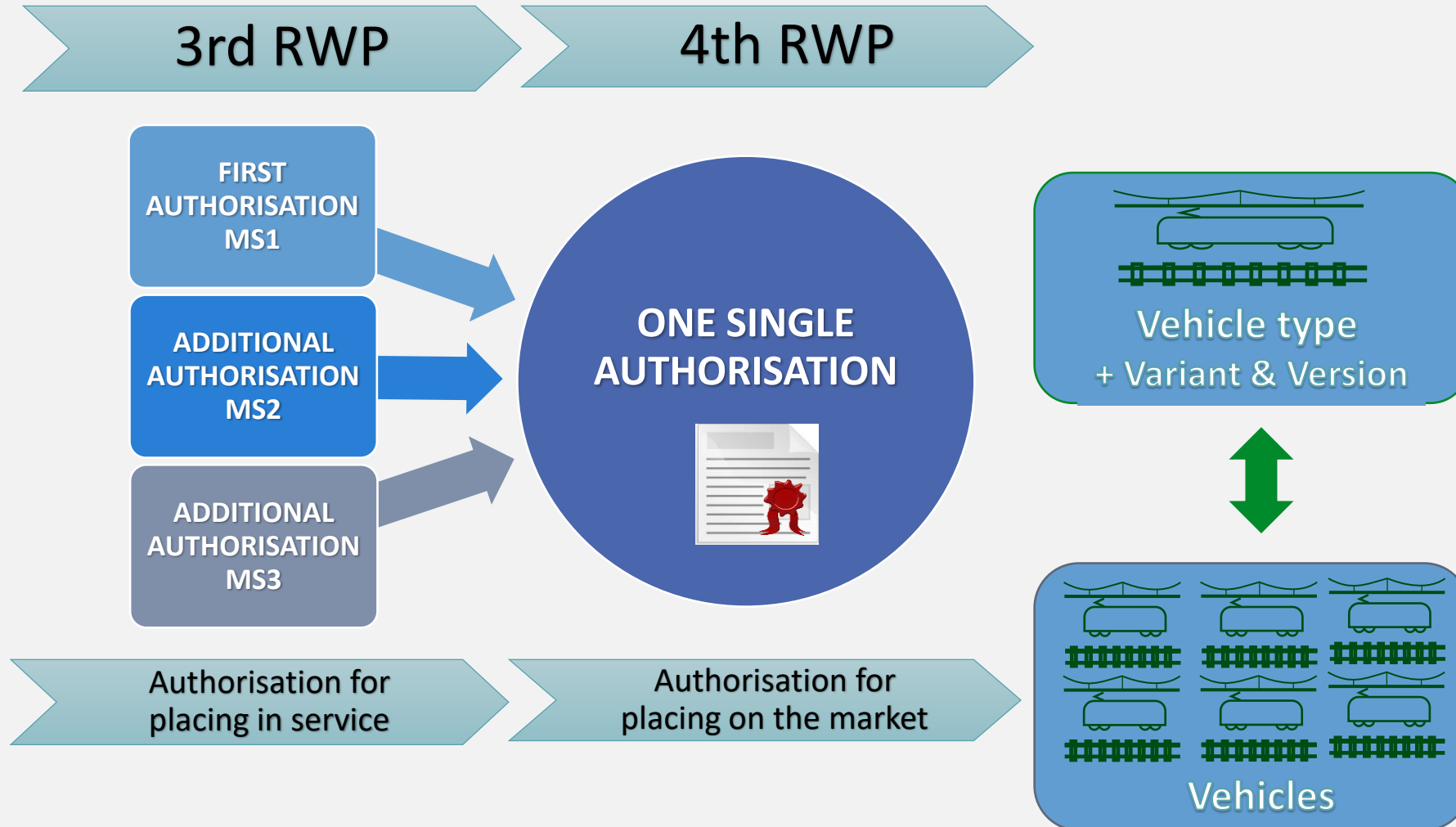


- **VA Toolbox** provides in a single place :
 - Simple access to relevant information and tools on VA.
 - It is accessible to Applicants, Authorising entities (ERA, NSAs) and on request to NoBos.
 - It should also help stakeholders to be aware of all available documentation (guidance, clarification notes, FAQs etc.).

- **Where :**

<https://eraeuropaeu.sharepoint.com/sites/VATool/SitePages/Vehicle-Authorisation-ToolBox.aspx>

Key aspects of the 4RP: Single authorisation



Key aspects of the 4RP: Authorising entity

The authorising entity depends on the area of use

**Area of use = more than one Member State
ERA authorising entity, collaboration with NSAs**

**Area of use = one Member State
The applicant can choose the Agency or the NSA**



All requests addressed via the OSS

Key aspects of the 4RP: Main steps



Applicant submits request for VA to the **One-Stop-Shop**

- Specifying the area of use
- Including relevant documentation



ERA/NSA issues APOM (or communicate negative decision)

- Within 4 months from reception of complete documentation
- Following detailed rules established in Reg. (EU) 2018/545



Vehicle registration

RU checks, including:

- Route compatibility
- Proper integration in the train composition

⇒ No need of „additional authorisations“
if vehicle stays within area of use, conditions for use and restrictions

Overview of the VA Process



Stage 1 Preparation of the application



Stage 2 Pre-engagement



Stage 3 Conformity assessment



Stage 4 Submitting the application



Stage 5 Processing the application



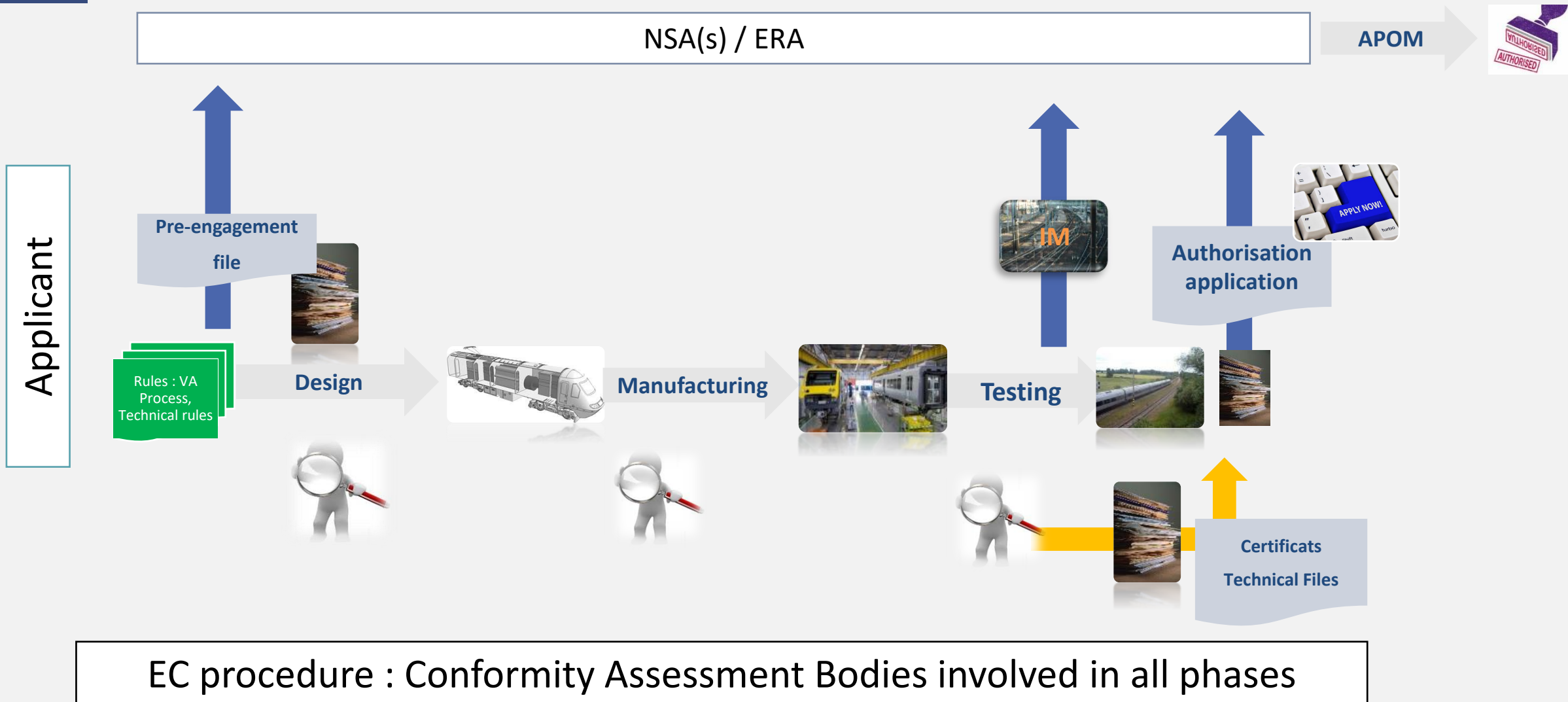
Stage 6 Final documentation



Suspension, revocation or amendment

EU HARMONISED PROCESS

Vehicle Authorisation overview



What means Area of use (AoU)?

- Area of Use of a Vehicle = MSs & list of networks
- An issued authorisation contains:
 - Area of use (MSs & Network(s))
 - Values of the parameters checked for technical compatibility
 - Conditions for use of the vehicle and other restrictions
- This means that **the actual lines on which a vehicle can operate can be smaller than the Area of use.**

What means Area of use (AoU)?

(a) Area of Use: Networks of Belgium, France, CT

(b) Values of parameters checked for technical compatibility btw Vehicle and the Networks of the AoU:

Parameter*	Value(s)*
INF <ul style="list-style-type: none"> Nominal track gauge Axle load Gauge Minimum radius of horizontal curve Rail inclination 	<ul style="list-style-type: none"> 1435 m 22,5 T GB, GC 100 m 1/20, 1/30
ENE <ul style="list-style-type: none"> Voltage and frequency Pantograph gauge 	<ul style="list-style-type: none"> 1,5kV, 3kV, 25kV-50Hz 1950 mm
CCS <ul style="list-style-type: none"> ETCS baseline Class B Radio System 	B3R2 TBL1+, KVB GSM-R BL 1

(c) Vehicle's compliance with the relevant TSIs and sets of national rules

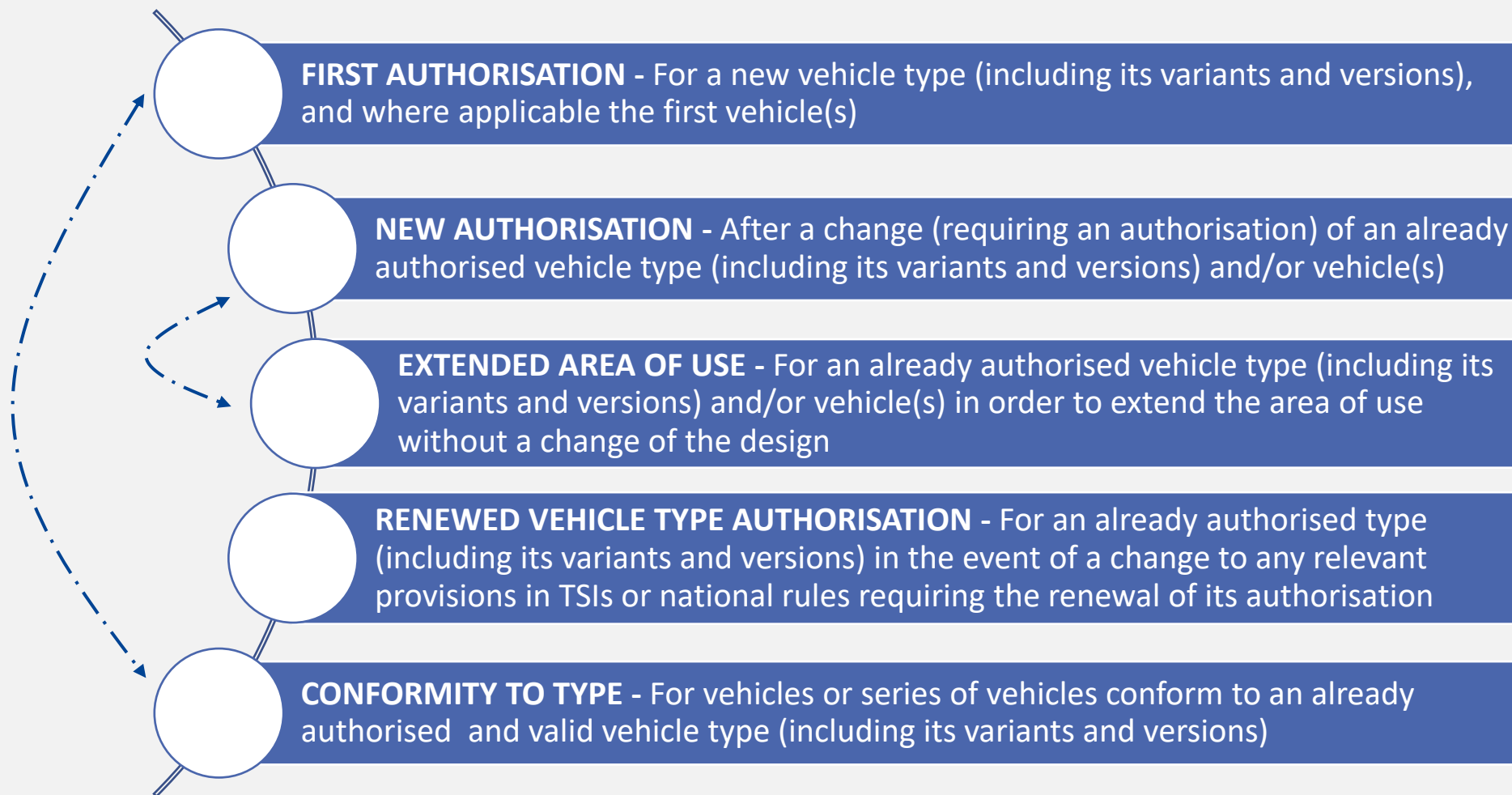
- TSIs: LOC&PAS, PRM TSI, NOI TSI, CCS
- National Rules: France, Belgium, CT

(d) Conditions for use of the vehicle and other restrictions:

- Maximum train current
- Braking performance
- Maximum Speed
- Weather conditions
- ...

* Illustrating purpose : list of parameters/values non exhaustive

Authorisation cases



■ Pre-engagement

- Voluntary for the applicant, mandatory for authorising entity / NSAs for the area of use if requested
- Content of the application: article 23 Regulation (EU) 2018/545
- Baseline:
 - Opinion of the authorising entity and the NSAs for the area of use on the approach (strategy) proposed by the applicant
 - The approach (strategy) is described in the documents referred to in art 23 of Regulation (EU) 2018/545
 - Has a legal value, but cannot overcome other EU law (e.g. rules)
 - Validity of 84 months
 - Gives certainty to the applicant
- Pre-engagement is not:
 - A consultancy/training service to be provided to applicants
 - A way to perform a continuous assessment

Vehicle Type, Variant & Version

Vehicle Type

Defines the basic design characteristics of vehicle(s) [as covered by a type or design examination certificate]

Vehicle Type Variant

Option for the configuration of a vehicle type that requires an authorisation

Vehicle Type Version

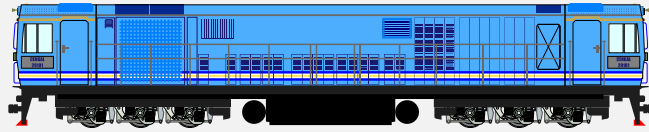
Option for the configuration of a vehicle type or vehicle type variant that does not require an authorisation

Vehicle

Railway vehicle suitable for circulation on wheels on railway lines, with or without traction; a vehicle is composed of one or more structural or functional subsystems

Type, Variant & Version

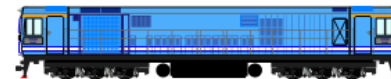
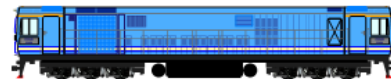
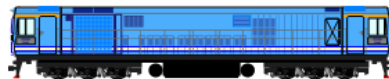
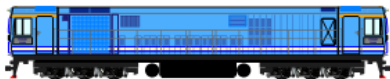
Vehicle type = concept identified in ERATV



Conformity to Type :
All the vehicles conform to the same type

Type, Variant & Version

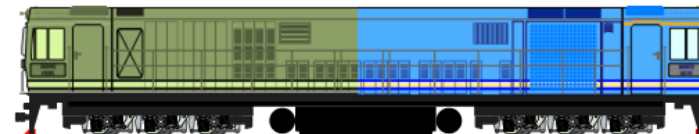
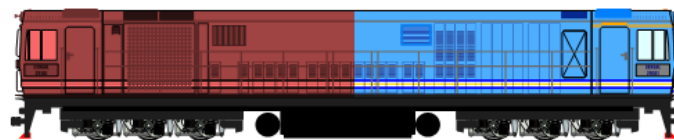
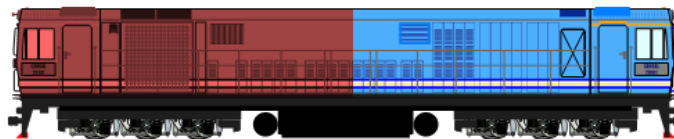
Vehicle type = concept identified in ERATV



**Shall be
authorised**

Vehicle variant A

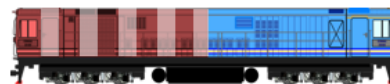
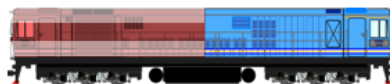
Vehicle variant B



**Do not require a
authorisation**

Vehicle variant A
version 1

Vehicle variant A
version 2



Case of New authorisation

When is a new authorisation required?

In case of a change to an authorised vehicle/vehicle type

Article 21(12) of Directive (EU) 2016/797

At least one of the following criteria shall be triggered:

- **Art 21(12)(a):** changes beyond the thresholds defined in the TSIs (basic design characteristics)
- **Art 21(12)(b):** change has the potential to impact safety adversely (even if in the real implementation it does not)
- **Art 21(1)(c):** it is required by the relevant TSIs (specific changes always require a new authorisation)

A change that does not require authorisation on the grounds of rules compliance, namely 21(12)(a) or (c), may still affect adversely safety, and may require a new authorisation.

Case of New authorisation

Categories of changes

The Regulation 2018/545 defines 4 categories of changes:

- Art 15(1)(a): the change does not introduce a deviation in the technical files accompanying the EC declaration(s) of verification
no changes in the design
- Art 15(1)(b): change that introduces a deviation in the technical files but does not impact basic design characteristics nor triggers article 21(12) of Directive (EU) 2016/797
change in the design that does not require a new authorisation
- Art 15(1)(c): change that impacts basic design characteristics but does not trigger article 21(12) of Directive (EU) 2016/797 and does not require a new authorisation
change that needs to be reflected in ERATV, no need for a new authorisation
- Art 15(1)(d): change that triggers article 21(12) and requires a new authorisation
change in the design that requires a new authorisation

Case of changes to existing RST (Type)

Point 7.1.2 of LOC&PAS

- Compliance with TSIs (LOC&PAS TSI, NOI and PRM) for **only** TSIs parameters **which may be affected by the change(s)**.
- Particular provisions applicable to existing RST **not covered by an EC DofV** with a 1st authorisation **before June 2015** :
 - Compliance with TSIs is deemed established when :
 - basic parameters improved in direction of the TSI defined performance and
 - demonstration that corresponding essential requirements are met and
 - the safety level is maintained and, where reasonably practicable, improved.
 - Justify the reasons for which the **TSI performance was not met**, included in the technical file, if any, or in the original technical documentation of the vehicle.

Case of Extension of the area of use

Authorisation case defined in Article 14(1)(c) of Regulation (EU) 2016/797

1. Change of the area of use of an authorised type without changes in the design (**without modifications**)
2. The checks to be performed **shall be limited to** the **technical compatibility** between the vehicle and the extended network :
 - For existing vehicle particular rules applies and are defined in point : 7.1.4 of LOC&PAS TSI , 7.2.2.4 of WAG TSI and 7.4.2.4 of CCS TSI.
3. Checks already carried out af the first authorisation shall not be repeated
4. If the extension of the area of use covers networks in another MS, the Agency shall be the authorising entity.
5. Extension of the area of use also applies within 1 MS. The applicant can choose the NSA or the Agency as Authorising Entity

Case of Extension of the area of use

Example with Existing RST 7.1.4 of LOC&PAS

■ SCOPE:

Point 7.1.4 applies to **existing** RST :

- Not authorised in accordance with Directive(EU) 2016/797 and
 - Not compliant to the TSIs in force (including all amendments up to 2019) : TSI PRM1300/2014, TSI NOISE 1304/2014 and TSI LOC&PAS 1302/2014.
 - Registered with 'Valid' registration code '00', in the Vehicle Register (NVR or EVR) and
 - Maintained in a safe state of running.
-
- Point 7.1.4 not applicable to RST compliant with TSI LOC&PAS 1302/2014 as amended in 2020: extension of area of use of such RST should comply with regulation 2018/545 (article 30(2), article 39(4)).

Case of Extension of the area of use

Example with 7.1.4 of LOC&PAS

■ REQUIREMENTS:

■ Technical compatibility (TC) with new AoU

Compliance of RST with TC requirements defined in 7.1.4 (2) are performed through one or a combination of:

- Compliance with TSIs in force or with previous TSIs : in this case the checks are performed by a **NoBo**.
- Compliance with alternative specifications to TSIs (equivalent effect to the relevant requirements of TSI): specifications **are proposed by the Applicant**, they can refer to standards, specifications (e.g UIC 518 regarding running dynamics, UIC 505-1 for vehicle gauge ...).
- Evidence that the network(s) are equivalent: evidence may be based on the information of the RINF.
- Use of alternative specifications or equivalence of network is subject to **AsBo** assessment.

■ Specific cases

Compliance with SCs of the extended area of use : **subject to NoBo checks when the SCs are described in TSI.**

■ National rules

Compliance with the National rules **on top of TSIs** related to Open points, SCs not described in the TSIs and TC of vehicle with existing network : subject to **DeBo** checks.

Case of Extension of the area of use

Example with 7.1.4 of LOC&PAS

▪ **TECHNICAL FILES** accompanying EC declaration of verification:

Compiled by the Applicant and include evidences of compliance with point 7.1.4 of TSI LOC&PAS :

- **NoBo** certificates and accompanying files, when assessment is performed against TSIs,
 - Justification and Documentation including **AsBo report**, when assessment is performed using alternative specification and/or the equivalence of requirements for technical compatibility with the network.
 - **DeBo** certificates and technical files regarding assessment of national rules.
-
- Compliance with point 7.1.4 is under the responsibility of the Applicant involving different conformity assessment bodies. Except for point 7.1.4 (a) and(b), there is no role of **NoBo** to check that the provisions of 7.1.4 have been demonstrated by the Applicant.

Questions?



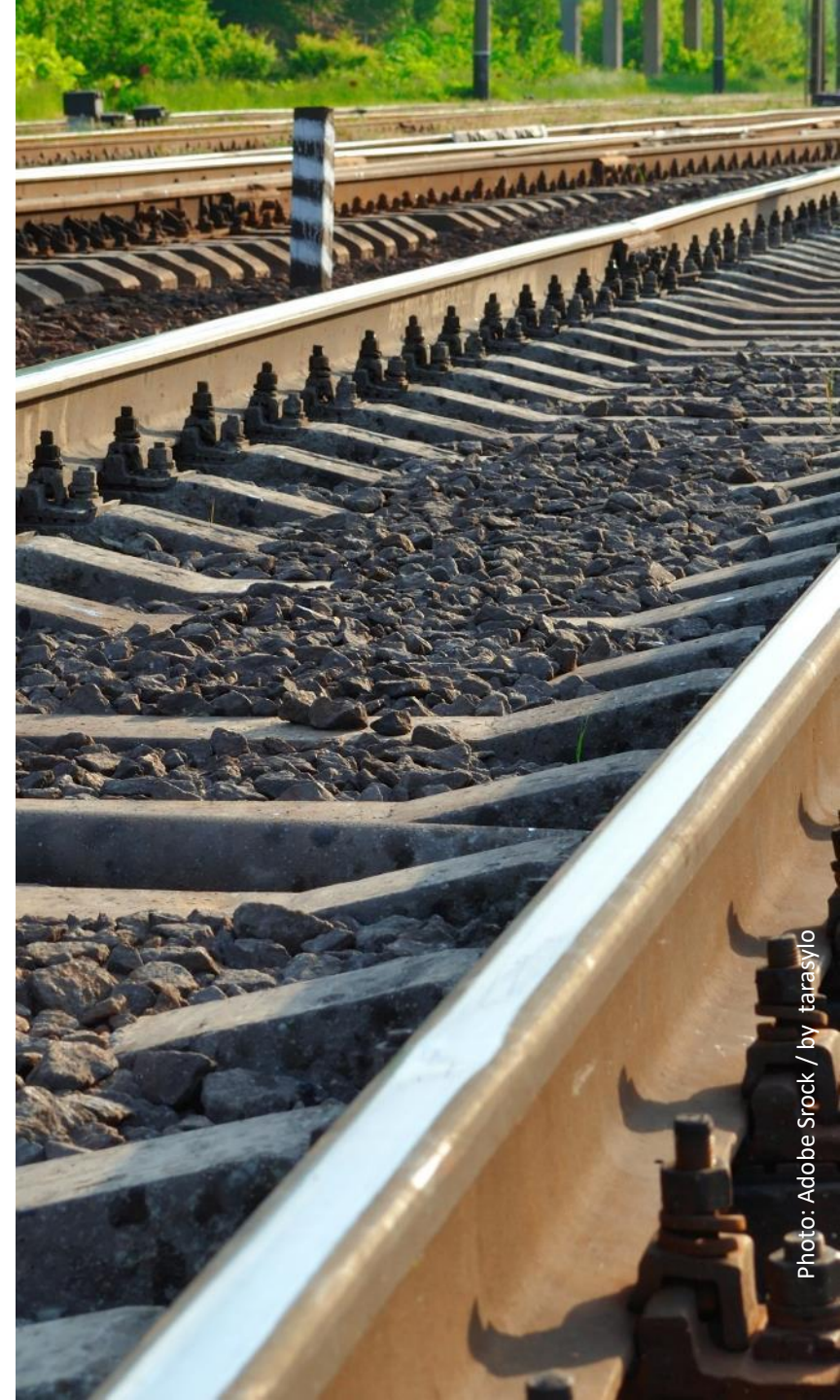
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Other VA aspects process

Requirements capture



Registers



Requirements capture

Ensure that requirements applicable to the Vehicle are:

- Identified
- Assigned to functions/subsystems
- Implemented; Validated and
- Addressed through conditions for use or other restrictions

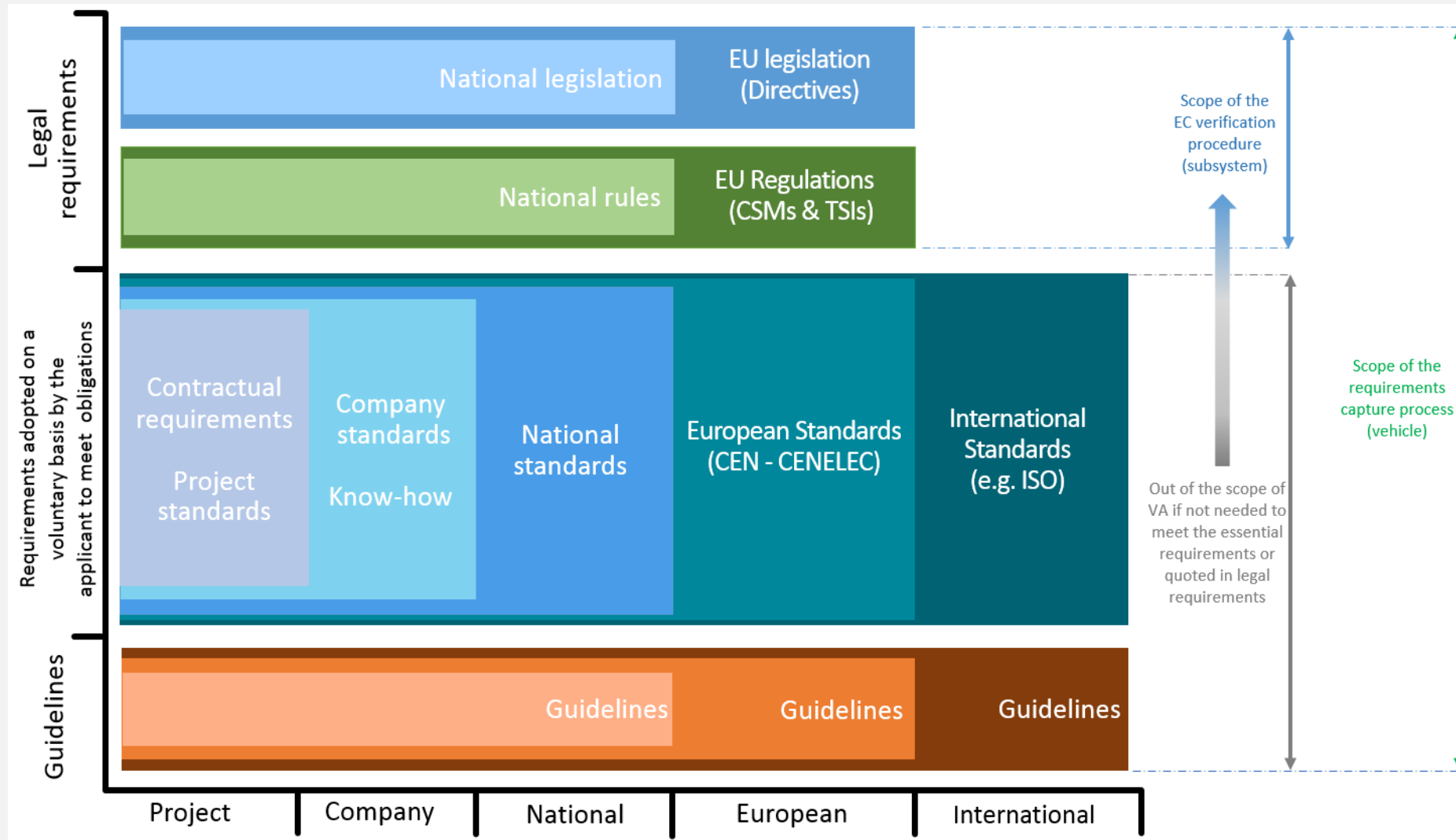
with the objective of managing and mitigating the identified risks to an acceptable level



Covers:

- Essential requirements for subsystems
- Technical compatibility of the subsystems within the vehicle
- Safe integration of the subsystems within the vehicle
- Technical compatibility of the vehicle with the network in the area of use

Requirements capture scope



Requirements capture roles

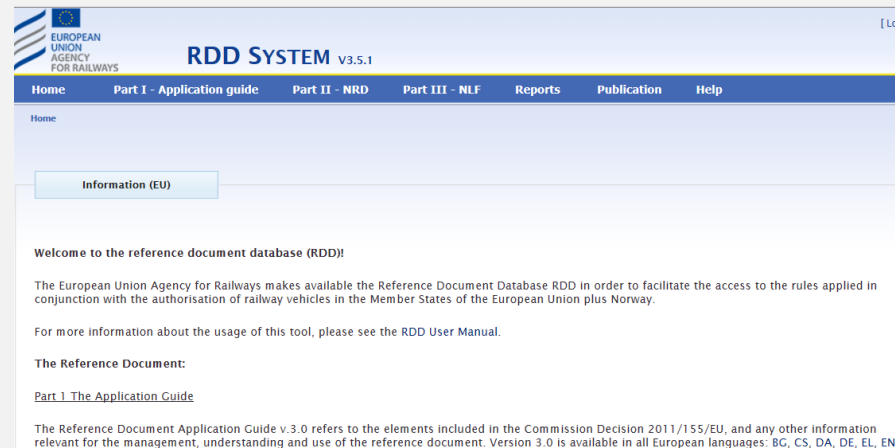
- **Applicant :**
 - Perform requirements capture process
 - Use Risk management process (Annex I of Reg (402/2013) for **safety** related aspects
 - Can use Risk management process for requirements capture for other essential requirements
- **Assessment body (CSM RA):**
 - Gives assurance and judgment that the processes are systematic and are able to capture, understand, analyze and mitigate hazards
 - Focus on the process. Not an exhaustive check of all the evidence supporting the requirements capture
 - Some detailed assessments (sampling) may be needed (vertical slice assessment of key aspects)

Requirements capture roles

- **Authorising entity :**
 - Checks completeness, relevance and consistency of evidences (Risk declaration, safety assessment report) when regulation (EU) 402/2013 is used
 - May challenge the assessment report if it demonstrates existence of serious safety risk (burden of proof allocated to authorities)
 - Performs further checks if another methodology is used (when allowed) :
 - Assess the details of the methodology
 - Assess the details of the evidences of the application of the methodology

Registers: National rules VA Reference Document Database (RDD)

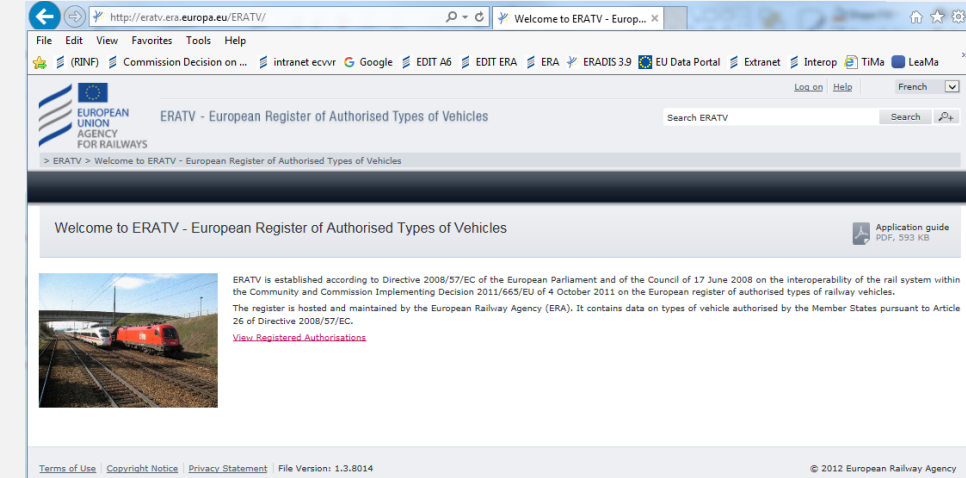
- Contains Vehicle authorisation national rules and acceptable national means of compliance
- Management and **publication** of the content in RDD is the responsibility of the MSs.
- Publicly available: <https://rdd.era.europa.eu/rdd/>



- Single Rule Database in future will replace RDD

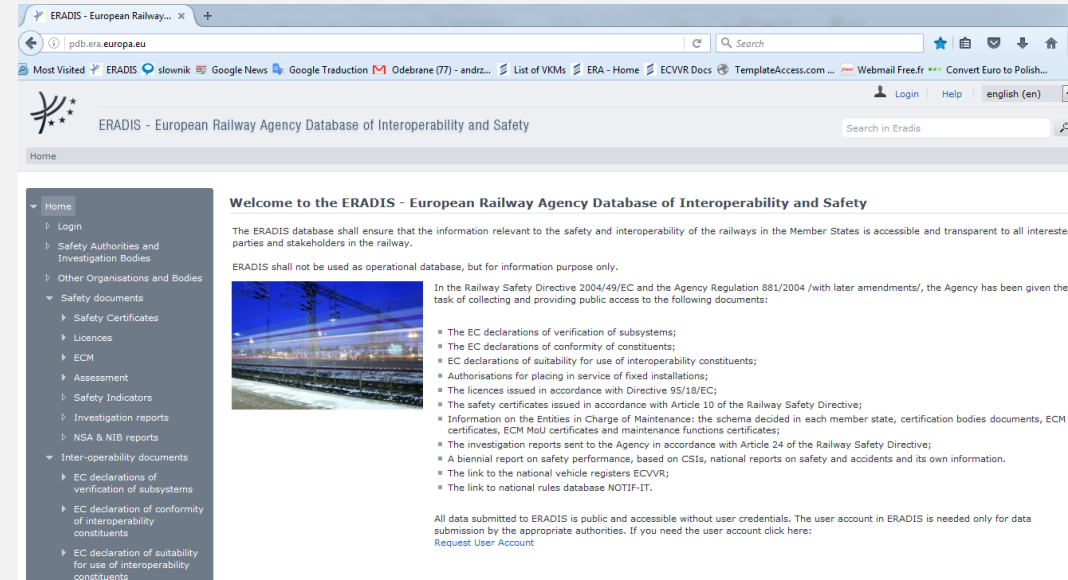
European Register of Authorised Types of Vehicles (ERATV)

- In operation since beginning of 2013 & contains authorised vehicle type
- Publicly available: <https://eratv.era.europa.eu/eratv>
- **Applicant:**
 - Responsible for the integrity of the data provided
 - Can fill-in part of the required data (technical data) on behalf of the authorising entity.
- **Authorising entity:**
 - Always issues a vehicle type authorisation even if the applicant has requested to have only a vehicle authorisation for placing on the market.
 - Responsibility for the data recorded in ERATV



ERA Database on Interoperability and Safety (ERADIS)

- Contains certificates, declarations
- Publicly available: <http://eradis.era.europa.eu>
- **Applicant of subsystem, Manufacturer of ICs submits EC declarations**
- **NoBo submits EC certificates**
- **DeBo:** No obligation however, the principle of "mutatis mutandis" could be applied
- **Authorising entity ensures that ERADIS is updated before** issuing authorisation



Register of Infrastructure RINF (RINF)

- Provides main features of the European Railway infrastructure.
- Publicly available: <http://rinf.era.europa.eu/RINF>
- In particular, provides the value of the parameters to be used to check the **compatibility between vehicle and route**
- **May be used for VA** when RINF is referenced by TSIs (e.g TSI Loc&Pas 4.2.8.2.9.4.2 on contact strip) or NRs



National Vehicle Register (NVR)

- Not part of vehicle authorisation
- National Vehicle Register: NVR Decision amended by Decision (EU) 2018/1614
- Register of all vehicles in service:
 - Kept by each MS
 - Contains information on authorisation and associated Keeper, Owner, ECM
 - NVRs and search engine 'Virtual Vehicle Register' in ERA constitute European Centralized Virtual Vehicle Register.
 - All the information on every vehicle is available via the ECVVR.
- ECVVR in operation since 2009: <https://vvr.era.europa.eu/VVR>
- Over 1 million vehicles available in ECVVR

Questions?



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Vehicle authorisation and route compatibility checks

2

VEHICLE AUTHORISATION FOR PLACING ON THE MARKET/ VEHICLE TYPE AUTHORISATION

- Technical compatibility of the subsystems within the vehicle
- Safe integration of the subsystems within the vehicle
- Technical compatibility of the vehicle with the network in the area of use



Authorising entity

The Agency (in
collaboration with
concerned NSAs)

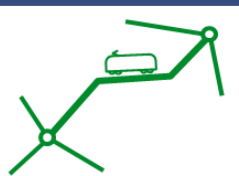
The Agency or NSA
(Applicant's
choice)

One-Stop Shop

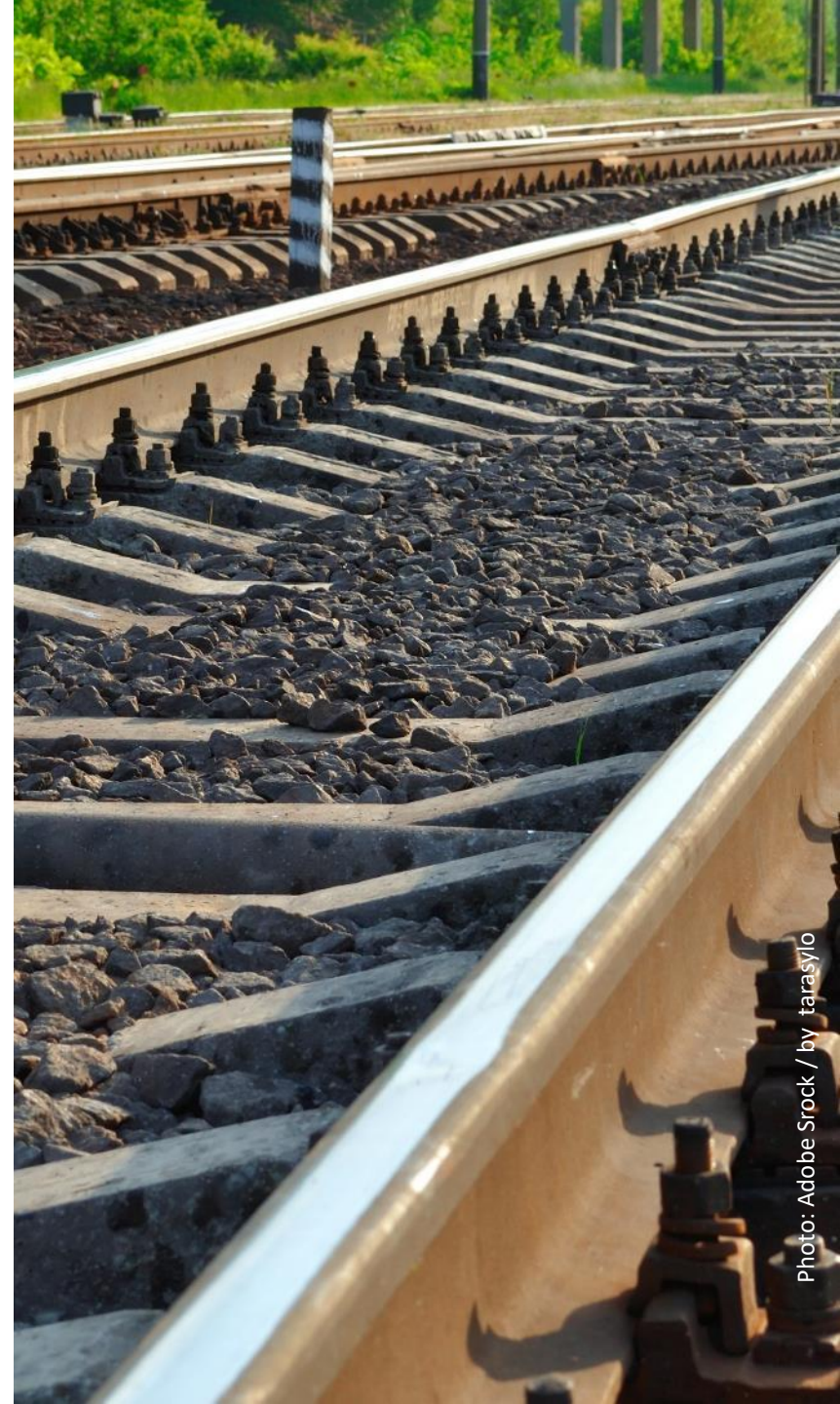
3

CHECK BEFORE THE USE OF AUTHORISED VEHICLE

Route compatibility
on the basis of the
Register of Infrastructure
(RINF)



Railway Undertaking



Vehicle Authorisation & Checks before use of vehicles

Applicant defines and demonstrates:

- ☐ **Area of use** (e.g France, Belgium)
- ☐ **Vehicle Technical compatibility with the Network(s) of the area of use** (e.g 3kV, 25kV, KVB, TBL1+, D4 etc.)
- ☐ **Conditions for use and other restrictions** (e.g max speed 140km/h)

Vehicle authorisation for placing on the Market (art 21)



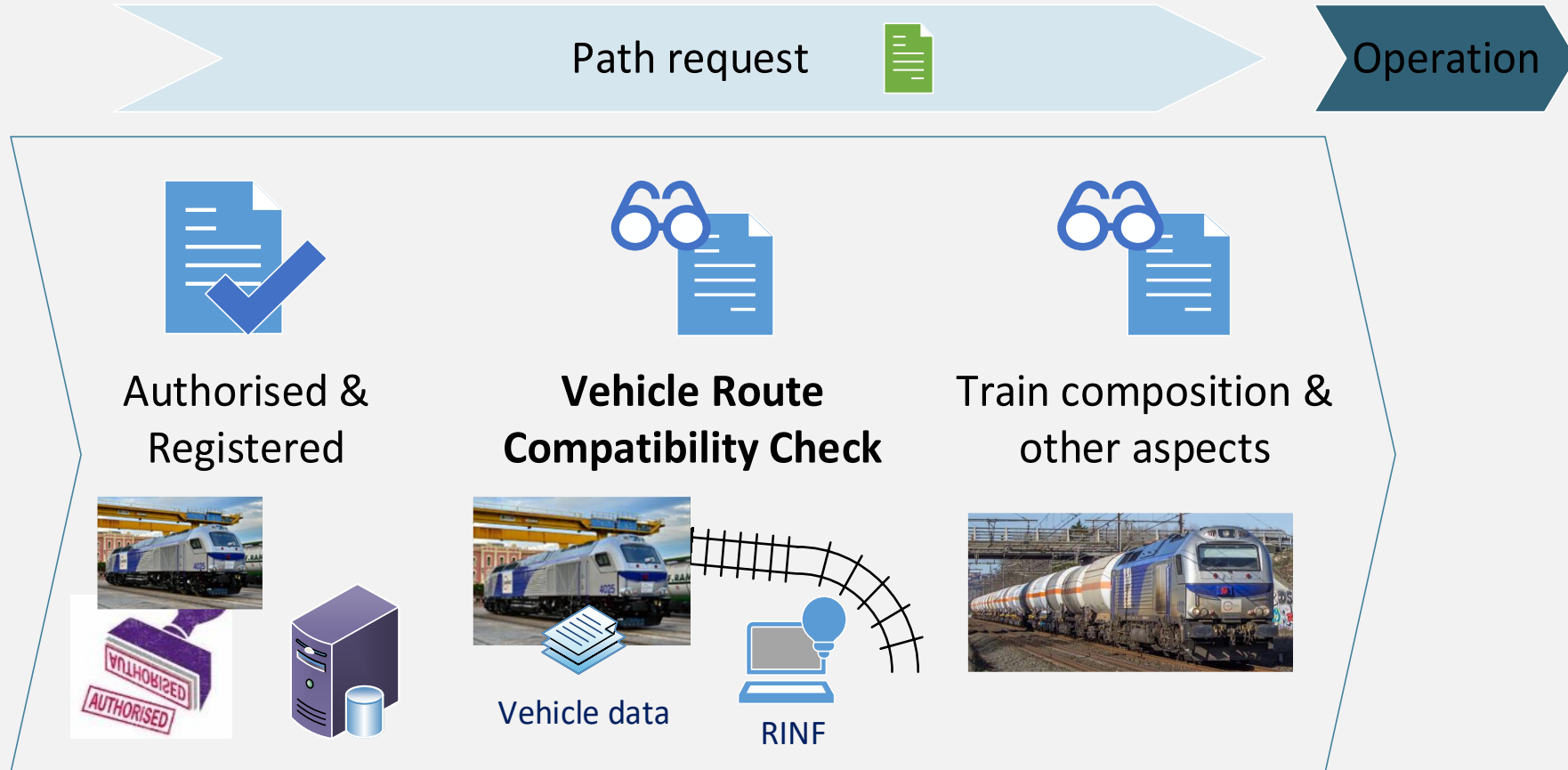
Railway Undertaking checks using its SMS process :

- ☐ Vehicle(s) is authorised and Registered
- ☐ Compatibility between Vehicle(s) and indented Route(s)
- ☐ Proper integration in the train composition

Checks before the use of authorised vehicles (art 23)



Checks before use of vehicles







Under Safety Management System



Compatibility check between Vehicle and Route

RU task

Most of the Route compatibility items require a simple comparison


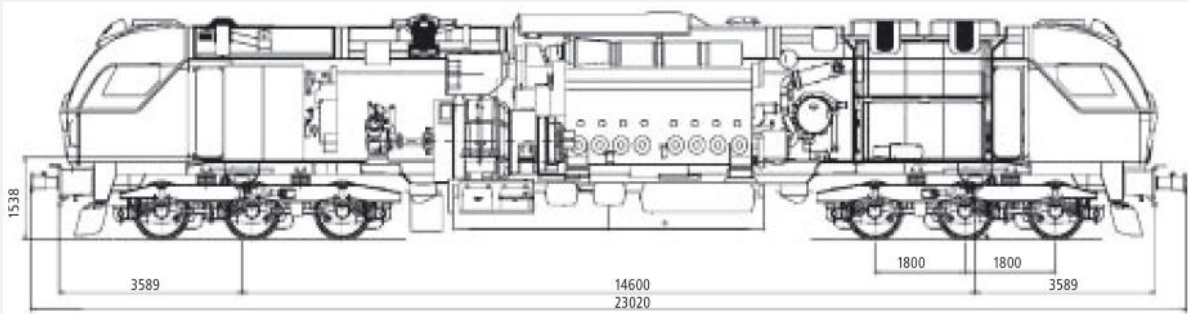
Interface	Vehicle data in ERATV and technical file		Route information available in RINF or provided by IM		Results
	ERATV	Value	RINF ref	Value	
Gauge	4.2.1	G1	1.1.1.1.3.1.1 1.2.1.0.3.4	G1	
Train detection systems	4.14.1	track circuits axle counters loops	1.1.1.3.7.1	track circuits axle counters	
Wheel set gauge	4.1.3	1435 mm	1.1.1.1.4.1 1.2.1.0.4.1	1435 mm	
Minimum in-service wheel diameter	4.8.2	991 mm	1.1.1.1.5.2	330 mm	

Compatibility check between Vehicle and Route

RU task

Some items to be checked need specific competencies
(e.g Traffic loads and load carrying capacity of infrastructure)

RU performs static and dynamic compatibility checks with the IM procedures

Interface	Vehicle data in ERATV and technical file		Route information available in RINF or provided by IM		Results
	ERATV	Value	RINF ref	Value	
	<ul style="list-style-type: none">Design mass (working order, normal and exceptional payload), 4.5.2 : 121000 kgStatic axle load (working order, normal and exceptional payload), 4.5.3: 20160 kgMaximum design speed , 4.1.2.1 : 120km/hVehicle length, 4.8.1 : 23,02mPosition of the axles along the unit (axle spacing):				<div></div> <div>Compatible with lines classified D4</div>
					

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