



ERC GmbH

Notified Body Interoperability
ECM Certification Body



Overview

- **History** – a European problem is diversity
- **New approach** – how to unify
- **Regulations** – laws and standards
- **Notified Body** – what we do
- **How it works** – assessment of conformity
- **ERC, AEbt and PJM** – strong partners

Europe is different...

- 1825 – first public railway in England
- Differences in...
 - gauge (Spain, Portugal, UK, Ireland, Russia,...)
 - power supply (AC/DC, voltage, Hz)
 - operation
 - train control systems
 - access to infrastructure

Stakeholders

Manufacturer

- Infrastructure
- Vehicle
- Energy
- CCS

Operator

- Operation
- Maintenance
- Telematics/Software

NSA

National Safety Authority

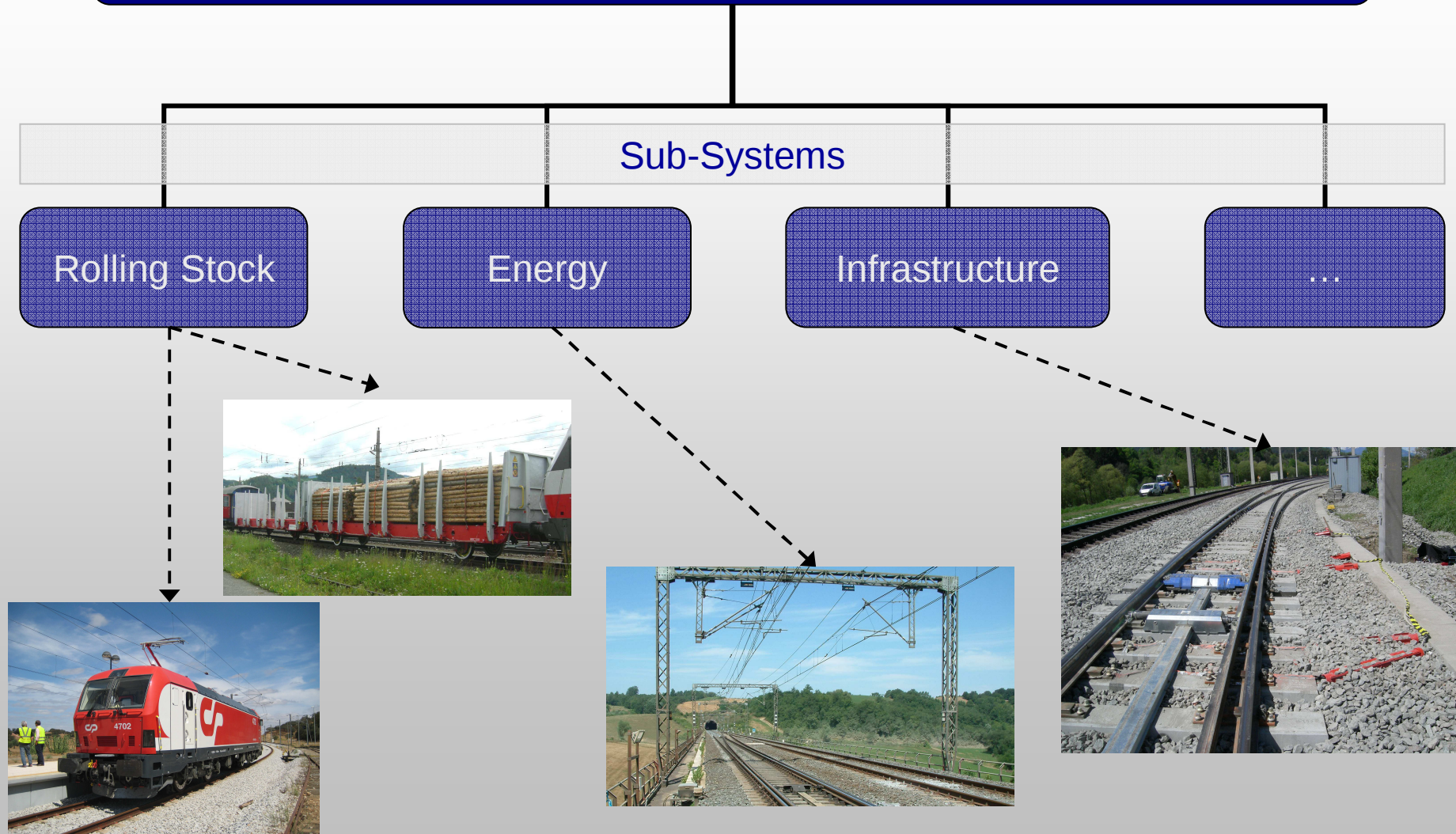
- Regulation
- Investigation

SAFETY and INTEROPERABILITY

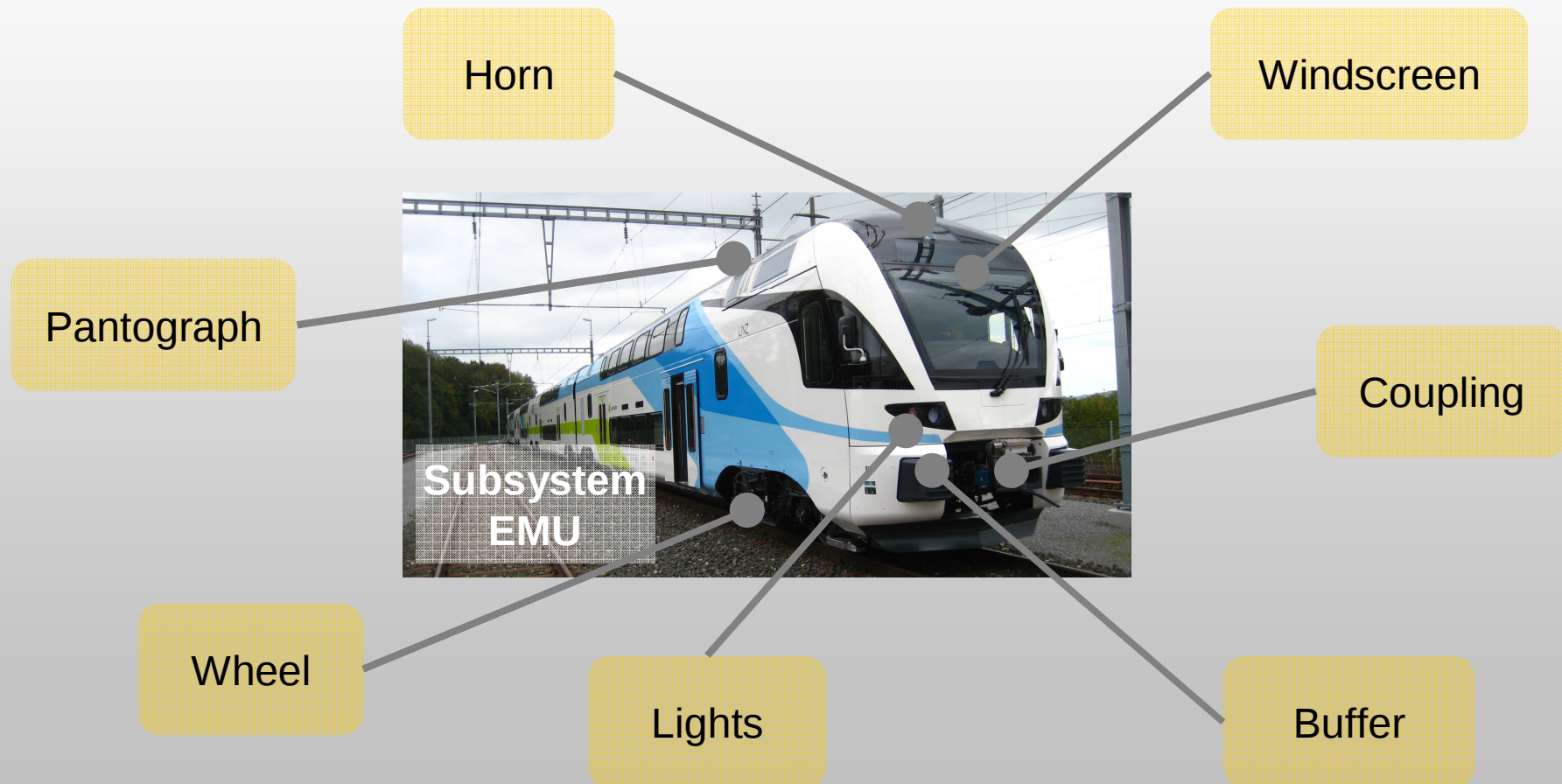
New approach in the EU

- Trans-European railway system
- Safety and interoperability
- Advantages
 - Costs
 - Administration
 - Safety
- Common standards needed
- Start in 1996

European Railway SYSTEM



Interoperability Constituents



Directives and TSI's

- Directive
 - defines subsystems
 - rolling stock
 - infrastructure
 - energy
 - ...
 - cross acceptance
 - general requirements
 - Safety
 - Reliability
 - Compatibility
 - Health, environment
 - 2008/57/EC
 - law status!!!
- TSI (*Technical Specification Interoperability*)
 - for each subsystem
 - technical details
 - geographical area
 - interaction with other TSI
 - list of “minimum requirements” to fulfill
 - many parts taken from standards (EN, UIC,...)

Directive 2008/57/EC

TSI High Speed

TSI Freight Wagon

TSI Infrastructure

TSI CCS
Command, Control, Signalling

TSI Operation

TSI Loco & Pas

TSI PRM
Persons with reduced mobility

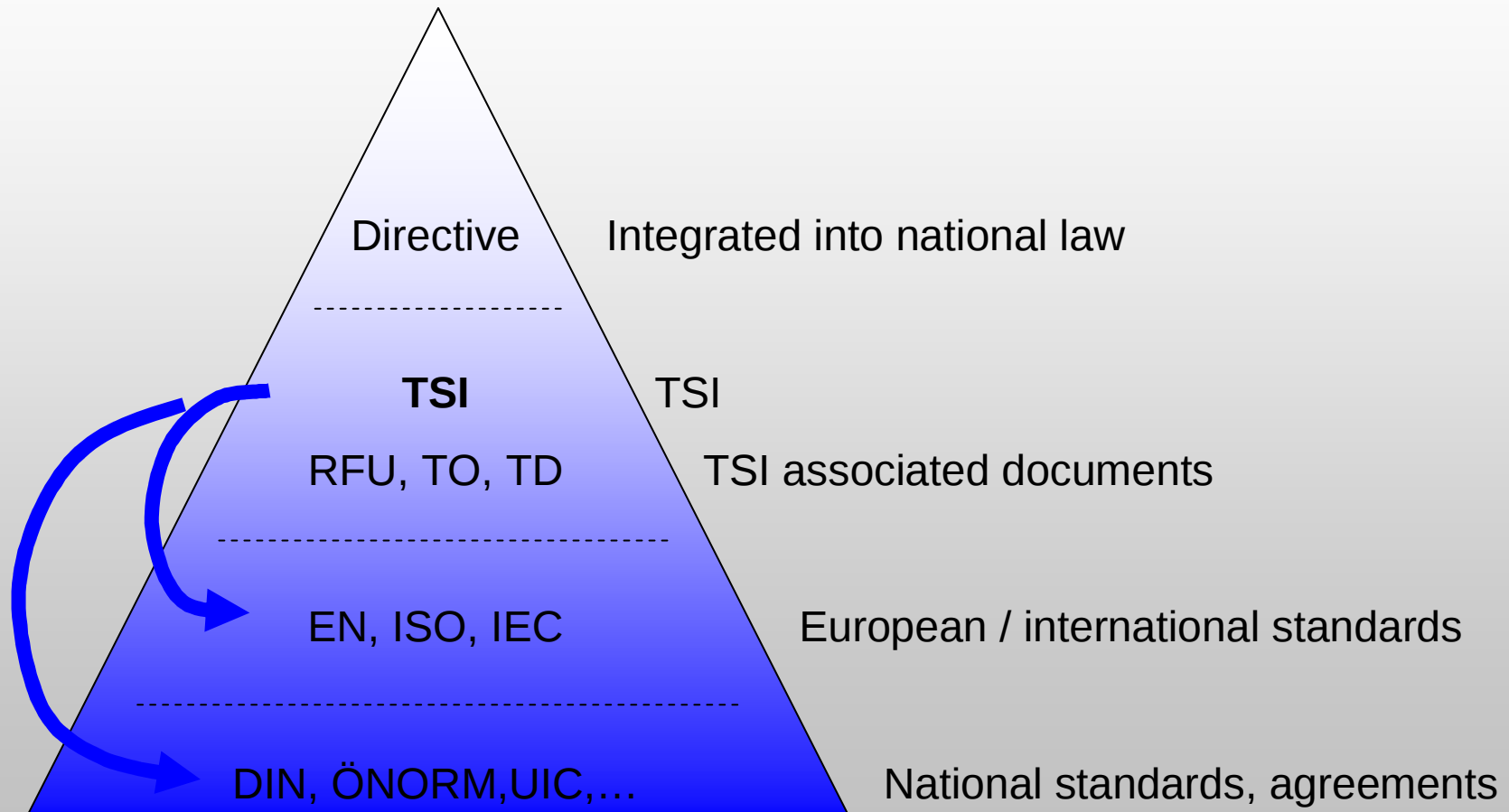
TSI Energy

TSI Fire

...

TSI Noise

Hierarchy of documents



TSI's - Rolling Stock

HIGHSPEED

- TSI Highspeed
 - 190+ km/h
 - TEN
 - Noise regulations included

CONVENTIONAL

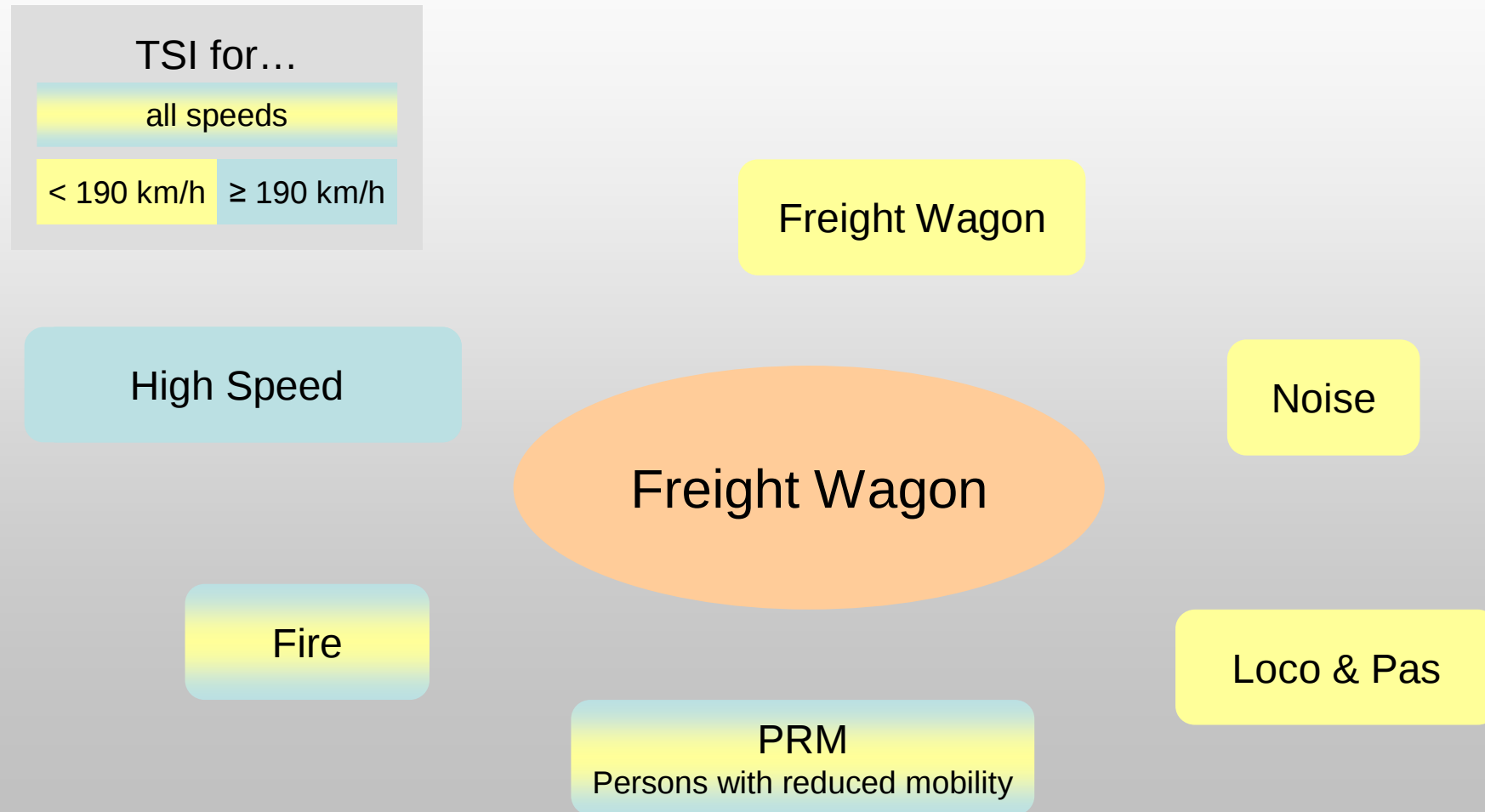
- TSI Freight wagon
- TSI Noise
- TSI Locomotives and passenger

- TSI Safety in tunnels (fire prevention)
- TSI Persons with reduced mobility

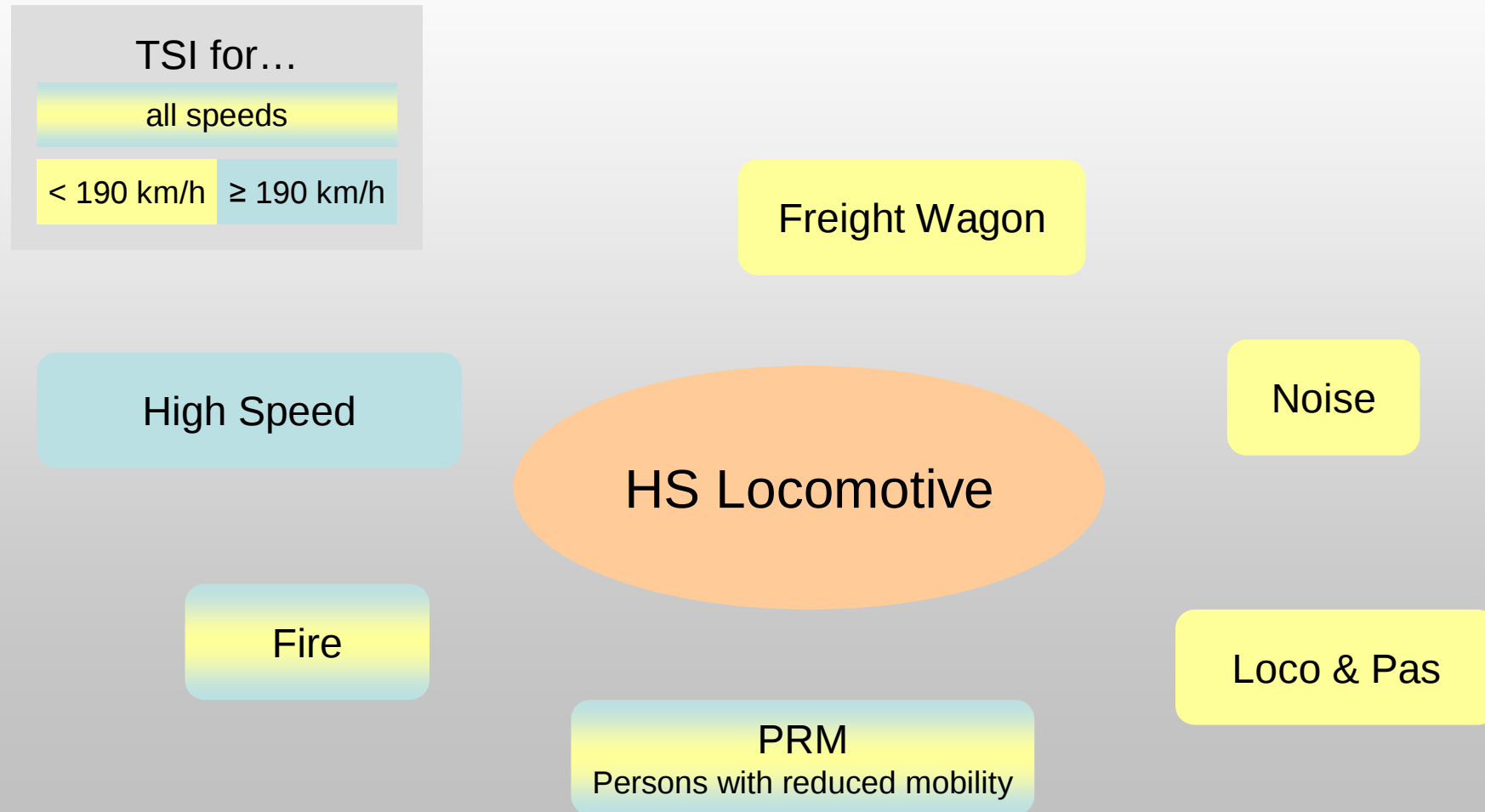
List of applicable standards

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Example – Freight Wagon

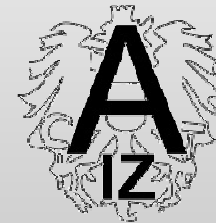


Example – High Speed Loco



Notified Body

- Independent organisation
- Accreditation for
 - EN 17020 inspection body (technical)
 - EN 17021 certification body (QM)
 - notification at EU (ERC: ID 2329)
- Assessment of
 - conformity with TSI
 - QM in design and production



“Modules” for assessment

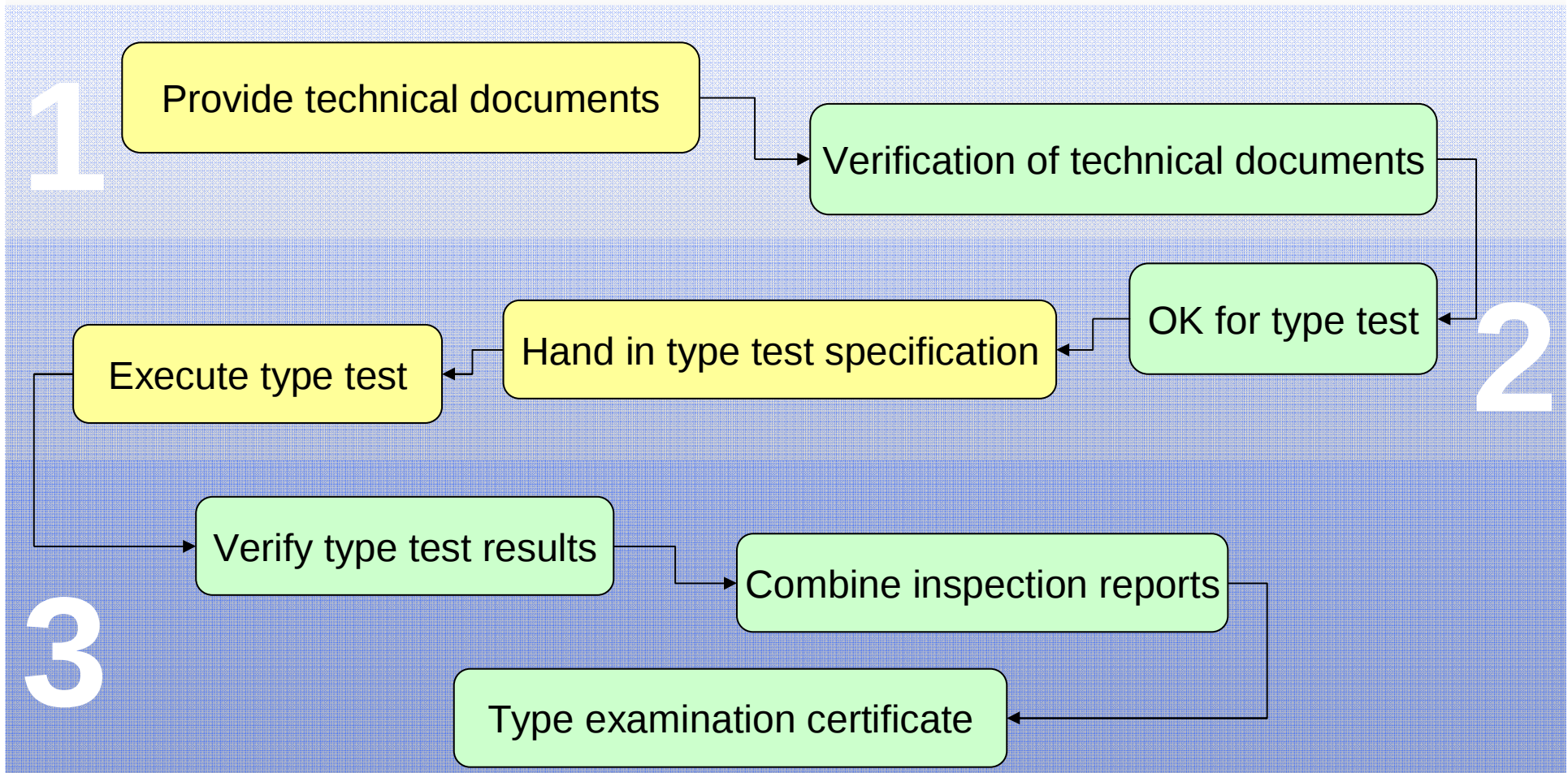
Interoperability constituents *		Subsystems	
B	Type examination for design and development phases	SB	Type examination for design and development phases
D	Production QM for production phase	SD	Production QM for production phase
F	Product verification for production phase	SF	Product verification for production phase

A standard conformity assessment for a vehicle (=subsystem) consists of

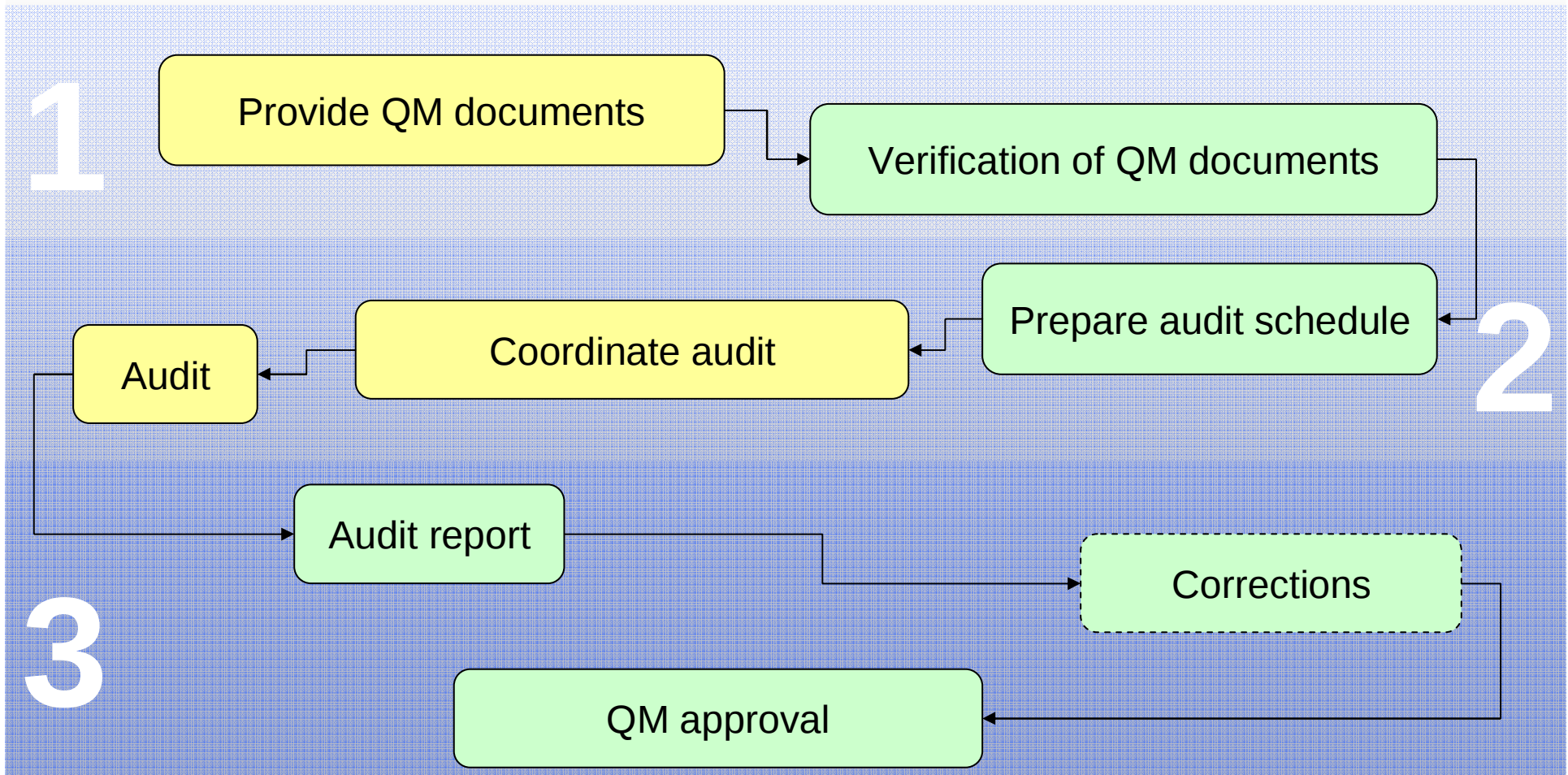
- **type examination** (SB; in both design and development phase)
- **audit** (SD) at the production site.

* EC declaration must be provided by producer!

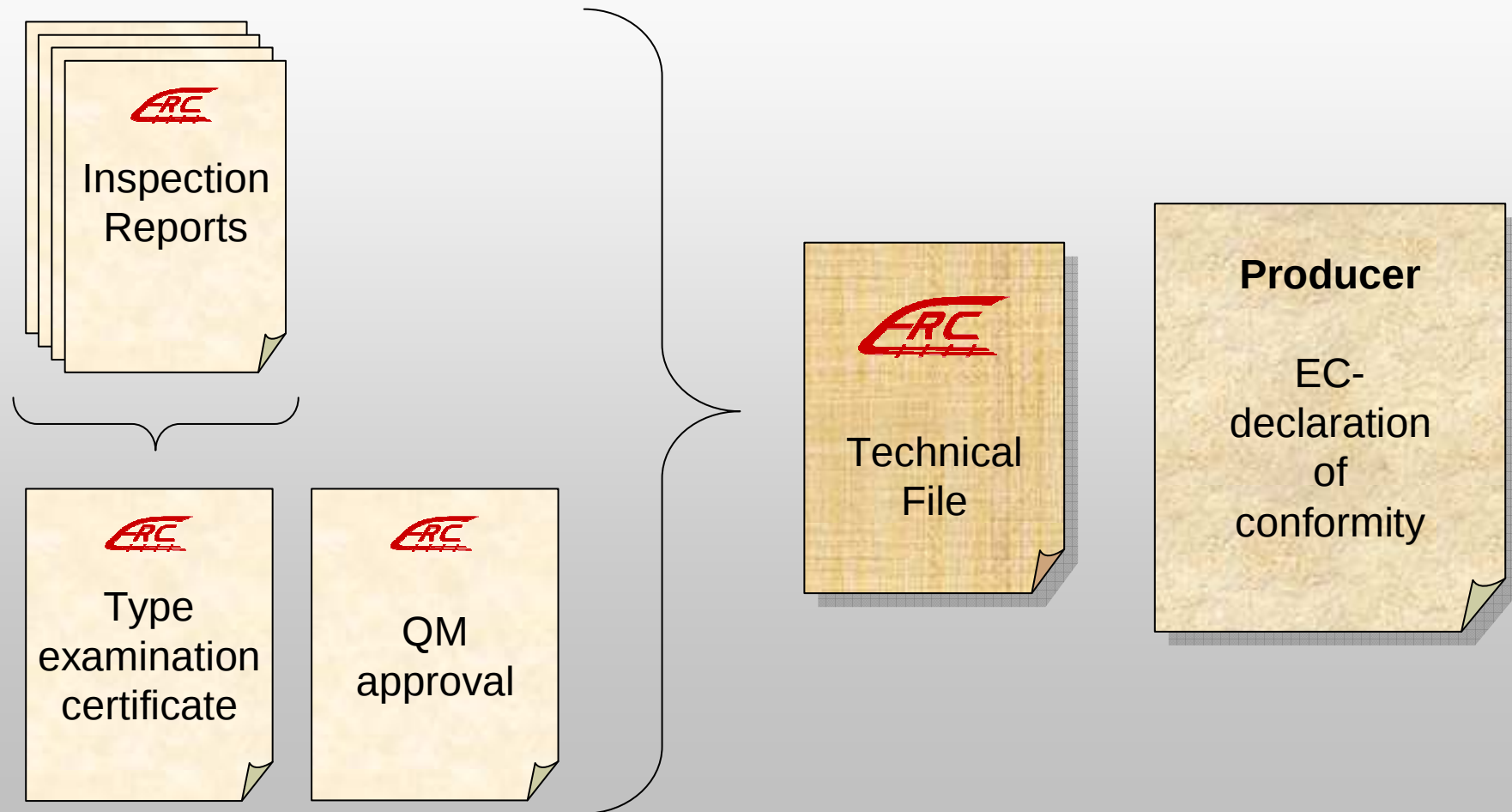
Technical assessment SB



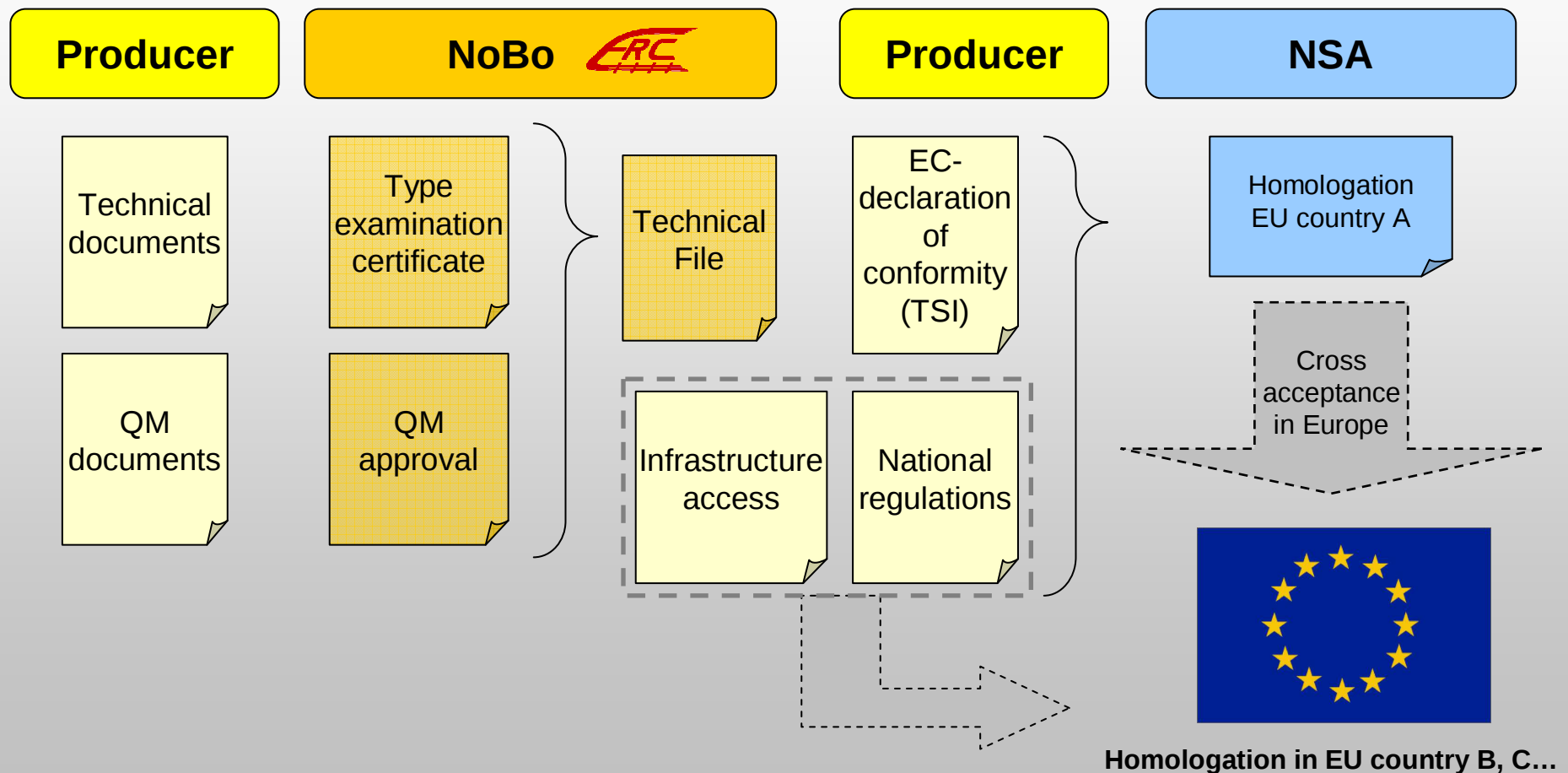
QM assessment SD



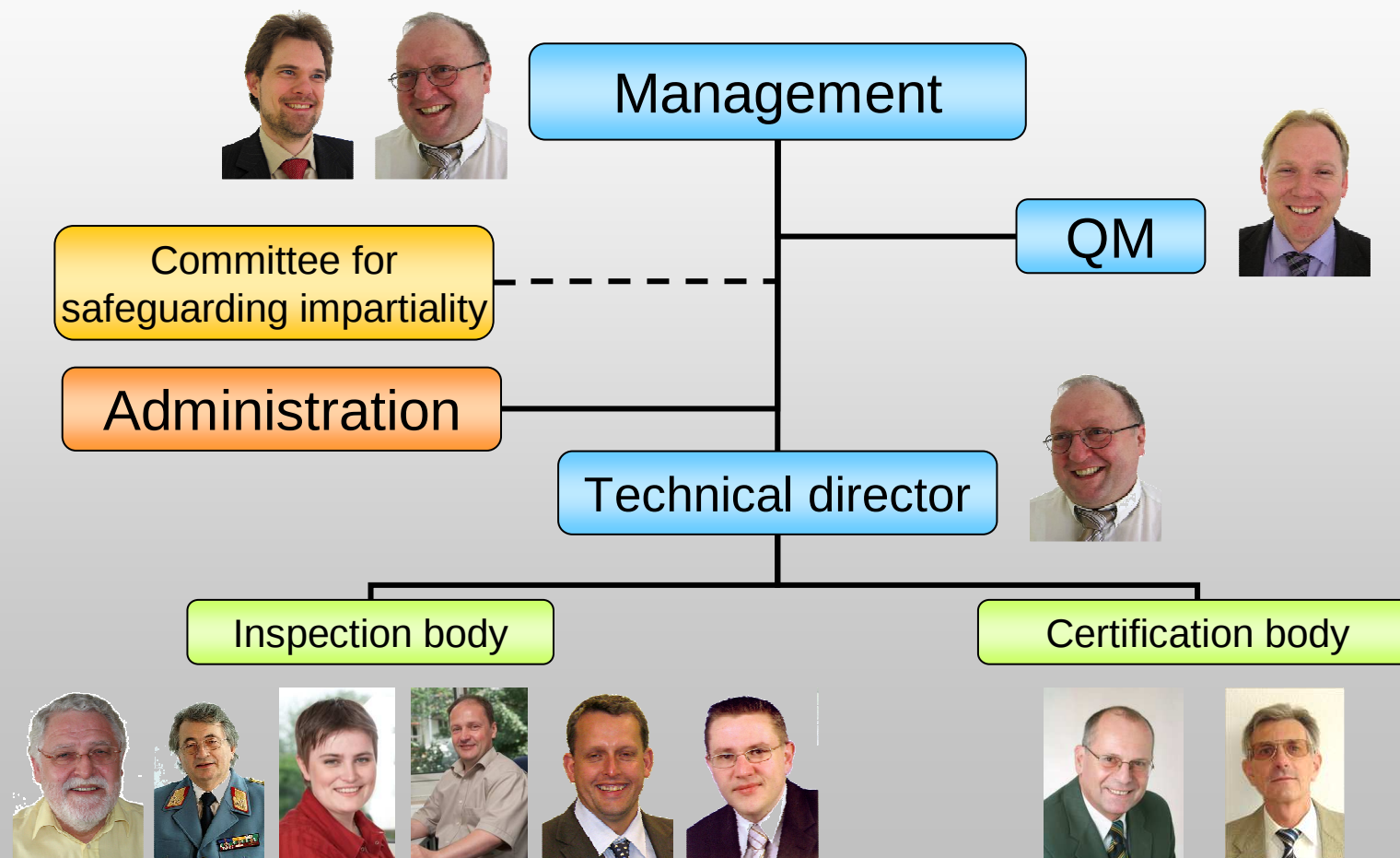
Main documents



Road to Homologation



ERC key personnel



Why choose ERC?



- Vehicle Strength
- Dynamics
- Brake
- Noise

ISO/IEC 17025
accredited
test laboratory



AEbt Angewandte Eisenbahntechnik

- Functional safety analysis
- Software
- Homologation (ISA)



Austrian Federal Railways

- Track
- Traction
- Development
- Authorities





Thank you for your attention

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