Advantages of the European regulations for rail and activities of the European Union Agency for railways (ERA)
ASEAN railway standardization goals


One size fits all

XL = European Free Size

TSI

GOAL: “Seamless Mobility Through the ASEAN Railway Networks Journey”

What?: Carry out “The Suitable” not “The Best” standards for our community
How?: Harmonization and Consolidation are key processes in development of ASEAN railway Standards
Who and When?: Establish the WG which members will coming from all ASEAN countries at the first stage and spin to ARA (ASEAN Railway Agency) in the future
What is the European Union Agency for railways (ERA)?

ERA in short is:
- The leading agency in railway safety and interoperability
- Issues certificates for Safety management systems for European Union
- Issues authorisation of railway vehicles valid for European Union
- Acts as the system authority for ERTMS / ETCS
- Providing technical expertise to EC and more than 50 states
- Supporting EC to develop and promote TSIs and European Regulations

Cooperation with 28 NSAs
Mission of the European Agency for Railways (ERA)

MAKING THE RAILWAY SYSTEM WORK BETTER FOR SOCIETY

The objective of the Agency is to contribute, on technical matters, to the implementation of the European Union legislation aimed at improving the competitive position of the railway sector by:

- Enhancing the level of interoperability of railway systems, and at
- Developing a common approach to safety on the European railway system,
- Contributing to creating a Single European Railway Area without frontiers, guaranteeing a high level of safety

The "4th Railway Package" transformed the Agency from a consultative body to an Authority capable of issuing Safety Certifications, Vehicle Authorisations, and of approving technical solutions for ERTMS tenders.
What are the tasks of a railway authority

**National (railway) Safety Authority** (Art. 16(2) in **Directive 2004/49/EC**) is responsible for:

- Issue, renew, amend and revoke relevant parts of safety certificates and of safety authorisations granted vs. Art. 10 and 11 of SD;
- Authorise placing in service of structural subsystems vs. Article 15 of Directive 2008/57 (on interoperability);
- Check that structural subsystems are operated and maintained vs. relevant essential requirements;
- Supervise that interoperability constituents are in compliance with essential requirements;
- Authorise placing in service of new and substantially altered rolling stock not yet covered by a TSI;
- Check that conditions and requirements laid down in safety certificates/ authorisations are met and that IM/RU are operating under requirements of Community or national law
- Monitor, promote, and, where appropriate, enforce and develop safety regulatory framework including the system of national safety rules
- Supervise that vehicles are duly registered in the national vehicle register (NVR) and that safety-related information in NVR is accurate and kept up-to-date
- Issue train driving licences and complementary certificates (Art. 6(1) of Directive 2007/59/EC)

Reduction of CO2 emissions, Relief of road traffic, ...

Increase rail share in the modal split

Improvement of competitiveness

Interoperability! (TSIs)

Railway Safety! (CSMs)

Market opening! (New Approach)
Public Interests - Interoperability

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Technical and administralional boundaries hindering competitive position for railway transport

London - Amsterdam (34 flights/day)  Heathrow –Schiphol 390 km
Potentially less than 4h by train but today 10  technical system boundaries
At least 5 Authorisations required

Solution for seamless travel:
- 1st step   Cross Acceptance of national rules
- 2nd step   One set of European rules (Interoperability)
A technical patchwork

- 5 types of electrification
- 21 signaling systems
- 5 track gauges
- 5 classes of axles load
- 6 line gauges
- National operational rules
- National technical rules
- National Authorisations
Main problems encountered for the acceptance of interoperable trains in European Countries:

- Different homologation processes for the compatibility with signalling systems due to the different train detection systems and the different requirements existing in European countries
- Different requirements for similar items (e.g. Requirements for human exposure, requirements for EMC with shunting radio, …)
- Some countries still refer to their National standards rather than equivalent European standards (e.g. DIN VDE 0848-3-1 instead of EN 50500)
- Some issues are not covered and partly unknown (e.g. no relevant requirements for the compatibility with Eurobalise reception equipment)
- Some requirements appear excessive (e.g. the need for compatibility with shunting radios in Germany and Austria, Ipso limits in Austria and Denmark)
- Additional requirements to existing European standards (e.g. German Specifications require an immunity against electric fields around 5GHz in addition to EN 50121-3-2)

Consequences:
- Special design solutions, special test instrumentation, repetition of tests ⇒ Significant extra costs both for manufacturers and operators.
From separate systems to a shared System

National network A
Domestic monopoly operator A

National network B
Domestic monopoly operator B

Single Rail Area - harmonised specification
Operators work seamlessly across borders (in competition)
Disadvantages of Island solutions

Advantages and disadvantages of national solutions:

- Effort for regulation and standardisation can be minimized
- Less contract interfaces

- Interoperability is questionable regarding...
  - other high-speed “island” infrastructure
  - other rollingstock
  - the use of the around existing infrastructure
- Creates a dependency from the supplier (monopoly)
- The small number of vehicle series...
  - can rise cost for a later rolling stock replacement
  - can have negative influence on the operating cost (cost of spare parts)
- Each “island” system will have its own special safety regulation. The safety authority has to handle all the different safety regulations.
- Creates problems and rises the cost if the operator should be changed later
Goal of Interoperability

- Remove technical barriers
- Improve railway competitiveness
- Implement the Single European Railway Area
Rail Interoperability

= Common rules for the design, operation and maintenance of the shared system
Interoperability – Existing TSIs

Subsystems
- Locos and coaches
- Wagons
- Operation
- Signalling
- Infrastructure
- Energy
- Telematics for freight
- Telematics for passengers

Transversal
- Tunnels
- Accessibility
- Noise
The Railway Standardisation Pyramid

1. Safety
2. Reliability and availability
3. Health
4. Environmental protection
5. Technical compatibility
6. Accessibility

- **Mandatory**
  - Specified in TSIs / NNTRs

- **Voluntary**
  - Applicant chooses own specification

**Level of DETAIL**

- **Company standards**
- **Other public standards and documents**
- **EN Standards**
- **Harmonised EN Standards (ENs)**
- **Mandatory Rules (OTIF Rules)**
- **Interoperability Directive 6 Essential Requirements**

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The “shared” system, managed by many actors each responsible for their own part of the system - including its safety - is intended to be operated as an open market for products and services:

**Single European Railway Area**

This requires harmonised and transparent rules and to define the optimal level of technical harmonisation and maintain/improve the overall safety levels.
Results of missing Technical Compatibility

- Cost per loco authorisation (excluding ERTMS)
  - 5m-30m (7m-40m$) for first authorisation
  - 2.5m (4m$) per additional authorisation thereafter
- Authorisation of ICE in France and TGV in Germany = 6 years, 30m Euros
- Cost for authorising an on-board ETCS for one infrastructure: 2.5m Euros and 2 years
  - (the same as it costs to authorise an airbus for the whole world)
- Cost for an additional authorisation for another route: Another 1m Euros and 12 months
Benefits of harmonised EU Regulation

Before harmonised EU Regulation

- Different fire extinguishers in each cab
- A different one for each country

With harmonised EU Regulation

- With Cross Acceptance only one in each cab
Reduction of National Rules

Mn EUR/ year for loco authorisation (EU total)
Each scenario ceteris paribus

- Diverse non-transparent requirements and checks
- Judgement based verification

2004 | 2010 | 2015 | 2050

- Transparency
- TSIS + National Rules
- Common Process + TSI scope extension + Cross Acceptance
- Network Harmonisation

Savings from

Slide 13
Application of European tools will reduce vehicle authorization costs significantly

Each scenario under same boundary conditions
Harmonised procedures and regulations will reduce costs

A complex mix of National Processes and national documentations

On the way

1x EU Process + Harmonised set of documentation
A technical patchwork

- 5 types of electrification
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- National operational rules
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- National Authorisations
ERTMS – the backbone for digital rail

Technological infrastructure

- Level 2 – centralized control centers
- Safe architectures
- Communication Infrastructure

Organizational capabilities

- Contract service management
- Maintenance
- Human resources

Connected Railway – software-enabled evolution

- Modular architecture
- Meet challenges ahead: Security, Digitalization, Innovation in competing transport
Harmonised signaling facilitates cross border operations – ERTMS / ETCS

#CCRCC2019 – The ERTMS conference

15-17 Oct 2019

Location: Valenciennes

Participants: EU rail stakeholders, EU and national politicians, signalling experts, IT experts

European Union Agency for Railways (ERA)
at Valenciennes
VALENCIENNES • FRANCE

15/10/2019, 14h00 – 18h30
16/10/2019, 09h00 – 18h30
17/10/2018, 09h00 – 16h30

Following the successful events in 2015 and 2017, it is our pleasure to announce the #CCRCC2019 / ERTMS conference held from 15-17 October in Valenciennes.

After having reached system maturity with stable specifications, ERTMS rollout has been intensified under the European Commission’s action plan. With the entry into force of the Fourth Railway package, digitalisation and the advent of big data, the rail sector is facing new challenges, which will be addressed at the conference.

Identifying common ground among Europe’s leading ERTMS experts – from the European Commission, the railway sector, vendors, users, and the ERA - shall ensure a smooth transition from the status quo into the digital future.
Public Interests – Railway Safety

Reduction of CO2 emissions, Relief of road traffic, ...

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Market opening! (New Approach)
The rise of safety management systems

- 6th July 1988
- 167 lost, only 62 survivors
- Lord Cullen’s recommendations (106) move away from prescription to safety cases as a more effective system.
The **SMS must:**

- be documented in all relevant parts;
- describe the **distribution of responsibilities** within the organisation of the IM or the RU;
- show how control by the **management** on different levels is secured;
- show how **staff** and their representatives on all levels are involved;
- show how **continuous improvement** of the safety management system is ensured.

All these requirements shall be included in the SMS.
The requirement of the **SMS** shall be fulfilled **through:**

- safety policy and corporate safety targets;
- compliance with standards or other prescriptive conditions;
- change management;
- risk management;
- operational and front-line staff competence management;
- communication and info exchange, document management;
- emergency management;
- reporting of unexpected outcomes;
- internal auditing of the SMS.

All these elements shall be defined in the organisation of the company and shall be **DOCUMENTED**
Safety Pillars

Safety Performance

- Technical Safety
- Safety Management System
- Human and Organisational Factors

Safety Culture
Strong Regulatory Safety Culture

Understanding and sharing the main objectives

Proactively taking responsibility

Strong and trusted relationships

Communication that works to resolve problems

Sharing faults and problems – even with competitors and regulators

Going beyond blame, to improvement and best practice
Safety culture refers to the interaction between the requirements of the Safety Management System, how people make sense of them, based on their attitudes, values and beliefs and what they actually do, as seen in decisions and behaviours.

A positive safety culture is characterised by a collective commitment by leaders and individuals to always act safely, in particular when confronted with competing goals.
Independent accident investigation body

- The objective is **prevention of accidents and possible improvement of railway safety**

- The investigation body shall investigate serious accidents and might investigation in addition also those accidents and incidents which under slightly different conditions might have let to serious accidents.

- The investigation body shall, at its discretion, decide whether or not an investigation of such an accident or incident shall be undertaken. In its decision it shall take into account:
  
  - (a) the seriousness of the accident or incident
  - (b) whether it forms part of a series of accidents or incidents relevant to the system as a whole;
  - (c) its impact on railway safety and
  - (d) requests from infrastructure manager, railway undertakings, safety authority
Reduction of CO2 emissions, Relief of road traffic, ...

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Market Opening – New Approach

The Interoperability Directive has adopted the principles of new approach Directives (toolbox):

- **Essential requirements (ERs) in Interoperability Directive**
- The applicant shall meet all ERs applicable to the product
- **Voluntary harmonised standards = presumption of conformity**
- **Third party assessment** *(Notified Body checks conformity against the TSI)*
- The applicant declares conformity with all applicable legislation
- Technical file contains the product’s limits and conditions of use
Railway specific addendum: Railway Safety Directive

- Railway Safety Directive allocates responsibility for safe operation and risk control to the
  - Railway Undertakings (RUs)
  - Infrastructure Managers (IMs) and
  - Entity in Charge of Maintenance (ECMs)

- Extension of New Approach to the user´s side

- Technical file with the subsystem´s limits and conditions of use is the mean of communication between manufacturer and users
Further tasks of ERA

In addition ERA also:
- supervises the railway safety performances in each of the EU member states
- Audits the authorities of EU national (railway) safety authorities
- Monitors conformity assessment bodies
- Organises network meetings with National safety authorities
- co-operates with the network of national (railway) accident investigation bodies
- Provides support in the field of train driver licenses (valid for EU)
- Supports EC and Shift2Rail Joint undertaking in the area of rail research
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<td>- UNECE and OTIF RID Committee of Experts for dangerous goods</td>
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<td><strong>Liaison with standardisation bodies</strong></td>
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Overview of Agency Activities in International Relations (2)

**Partnerships**
- Draft MoU with the Gulf Cooperation Council
- MoU with ANTT Brazil
- MoU with the Federal Railroad Administration in the USA
- Sharing experience with OSNR Australia

**Liaison in conjunction with the Commission and Shift2Rail**
- with non-EU partners in defining research needs and reviewing projects (avoiding double work on the same subjects)

**Platforms**
- Platform of Rail Agencies
Thank you for your attention!