Feedback from the European integration of railway infrastructure and services

THNS Forum
2013 November 9-10

Robert SARFATI

SYSTRA

The European railway system integration is an emblematic Case Study of how to achieve the interoperability of a transport system initially heterogeneous.

Historical background

19th and beginning of the 20th century

European nations defined their own railway system, making different technical choices and developing their own standards.

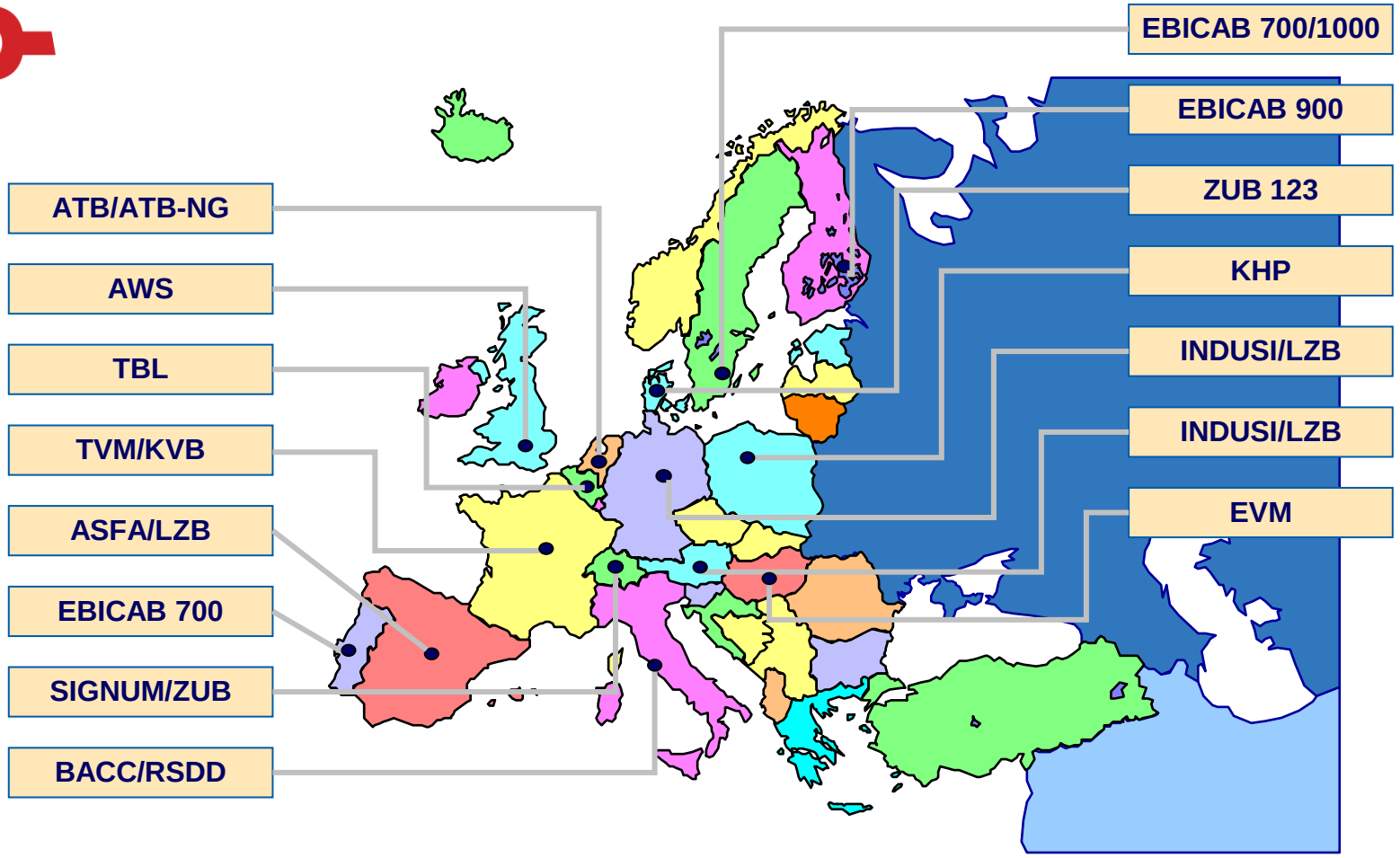
Second half of the 20th century

The way to integration leads European countries to merge political framework, market and infrastructures.

From 1991 to our days…

Since the 90's, the European railway system legal framework aims at creating a single transportation services market (1991), common interoperable technical standards (1996) with a single technical coordination (2004).

Example 1: There are more than twenty different systems to control the train speed and more than ten radio systems.



Interoperability policies aims at tackling this situation, implementing a common **European Train Control System**.

Example 2: National train systems have the same data exchange needs but different technical solutions.

Same needs…

- Capacity management
- Train preparation
- Operational information (train localization and train forecast)
- Post-operation feed-back

… different technical solutions

- Different process
- Different message formats
- Different codifications
- Different reference data (geographical locations, company identifier)

Interoperability policies aims at tackling this situation, defining common standards for **Telematics Application for Freight** and **Telematics Application for Passengers**.

The goal of Technical Specification for Interoperability (TSI) is to support long-term EU objectives, satisfying short-term sector needs.

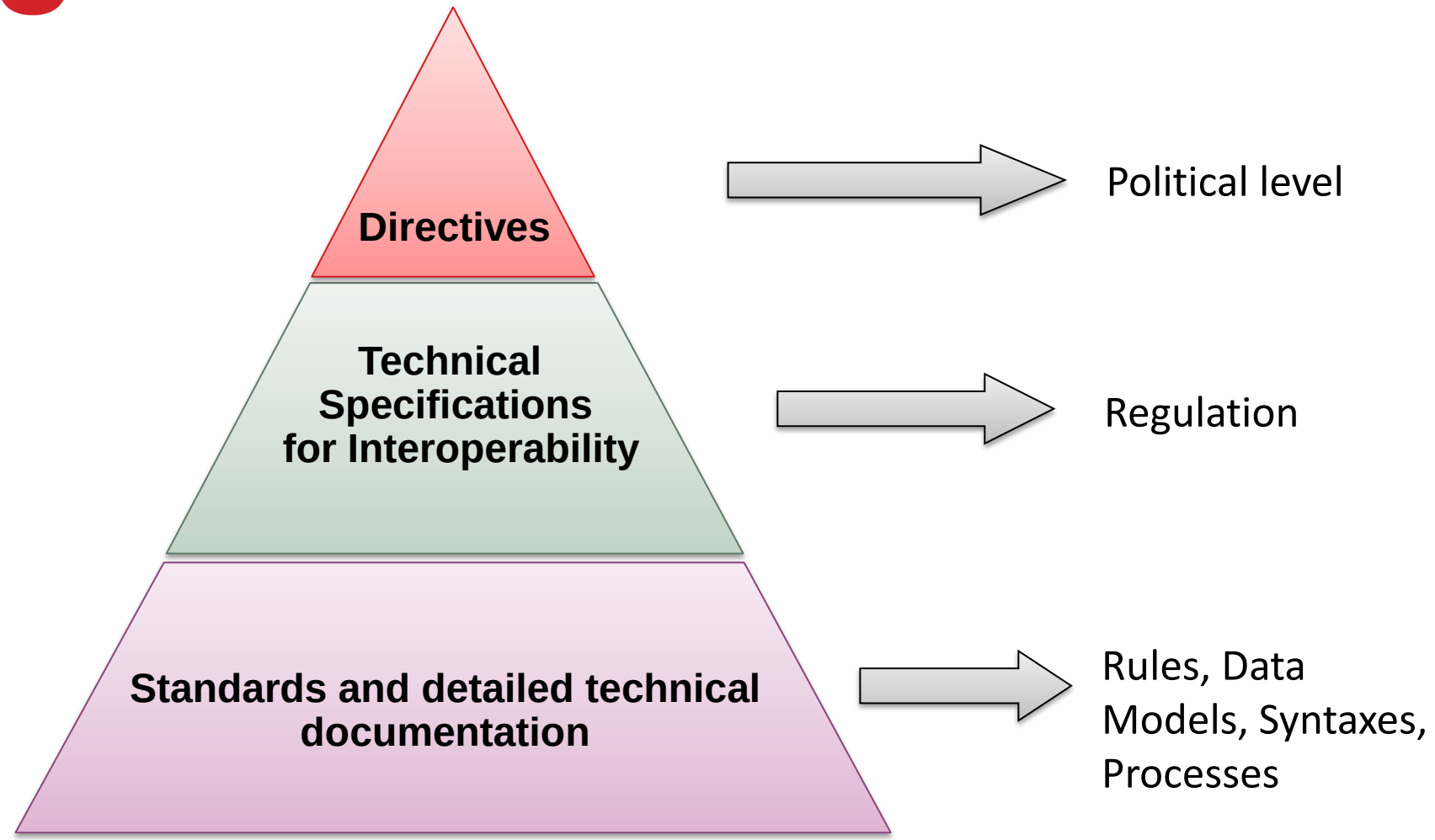
Long-term EU objectives

- European integration
- Ecological sustainability
- Energy saving
- Economic efficiency

Short-term sector needs

- Market integration
- Safety
- Service improvement (system reliability, customer information)
- Cost reductions

TSI policy aims at defining legal framework and technical standards for railway infrastructure and services.



TSI regulation covers the different subsystems of the railway system.

Subsystem covered by TSI

Structural areas:

- Infrastructure,
- Energy,
- Control-Command and Signalling,
- Rolling stock;

Operational areas:

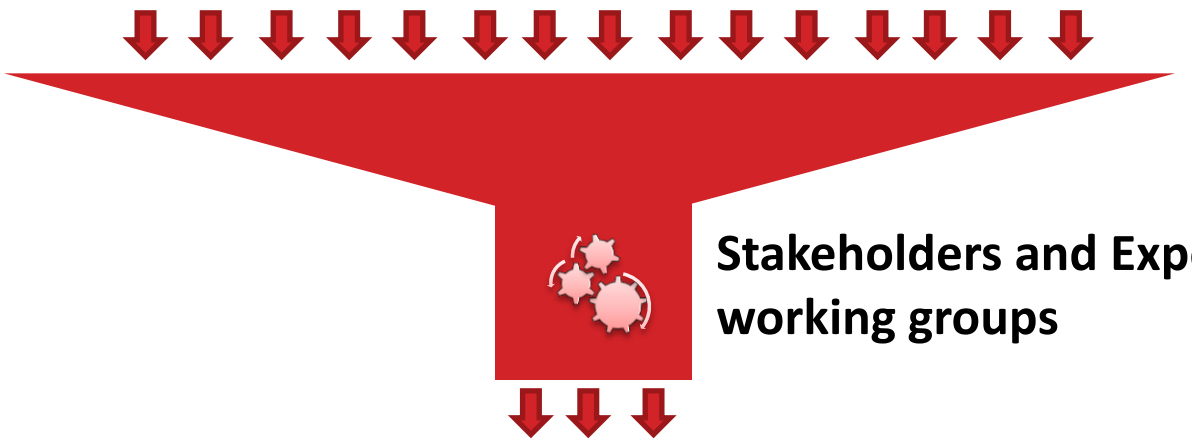
- Traffic operation and management,
- Maintenance,
- Telematics applications for passenger and freight services

Operational documentation is defined based on national experiences and experts collaboration.

National rules & principles

National operational information

Analysis of trans-European operation



Stakeholders and Experts working groups

ITS Regulation

Technical handbooks

European implementation Master Plan

TSI governance and evolution include all significant stakeholders.

Political Level	• European Commission • DG MOVE • Member States
Sector representatives	• Infrastructure Managers • Railway Undertakings • Wagon keepers • Ticket vendors / Freight forwarders • Rolling stock industry • Command-control and Signaling industry
Research bodies and programs	• European Rail Research Advisory Council • Shift2Rail

Rail system authorities are established.

Example: ERTMS main authorities

Configuration and Quality Control

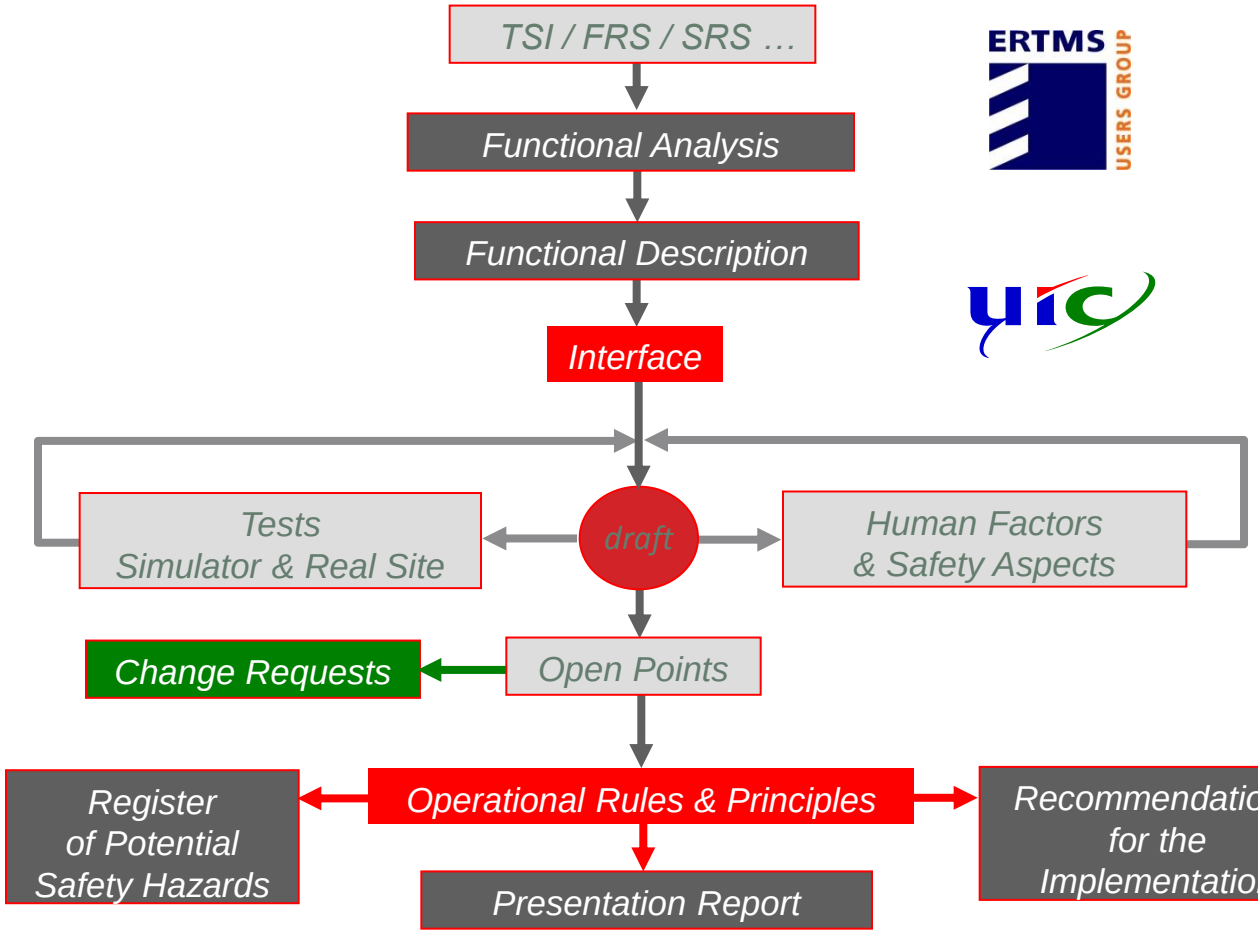
- Rules consolidation
- Rules update
- Particular studies
- FRS / SRS consistency
- National rules

System Evolution Change Management

- Change Requests under consideration
- writing of the missing rules
- Driver/Machine/Interface consolidation
- feedback
- trackside boards harmonization

Definition process are established.

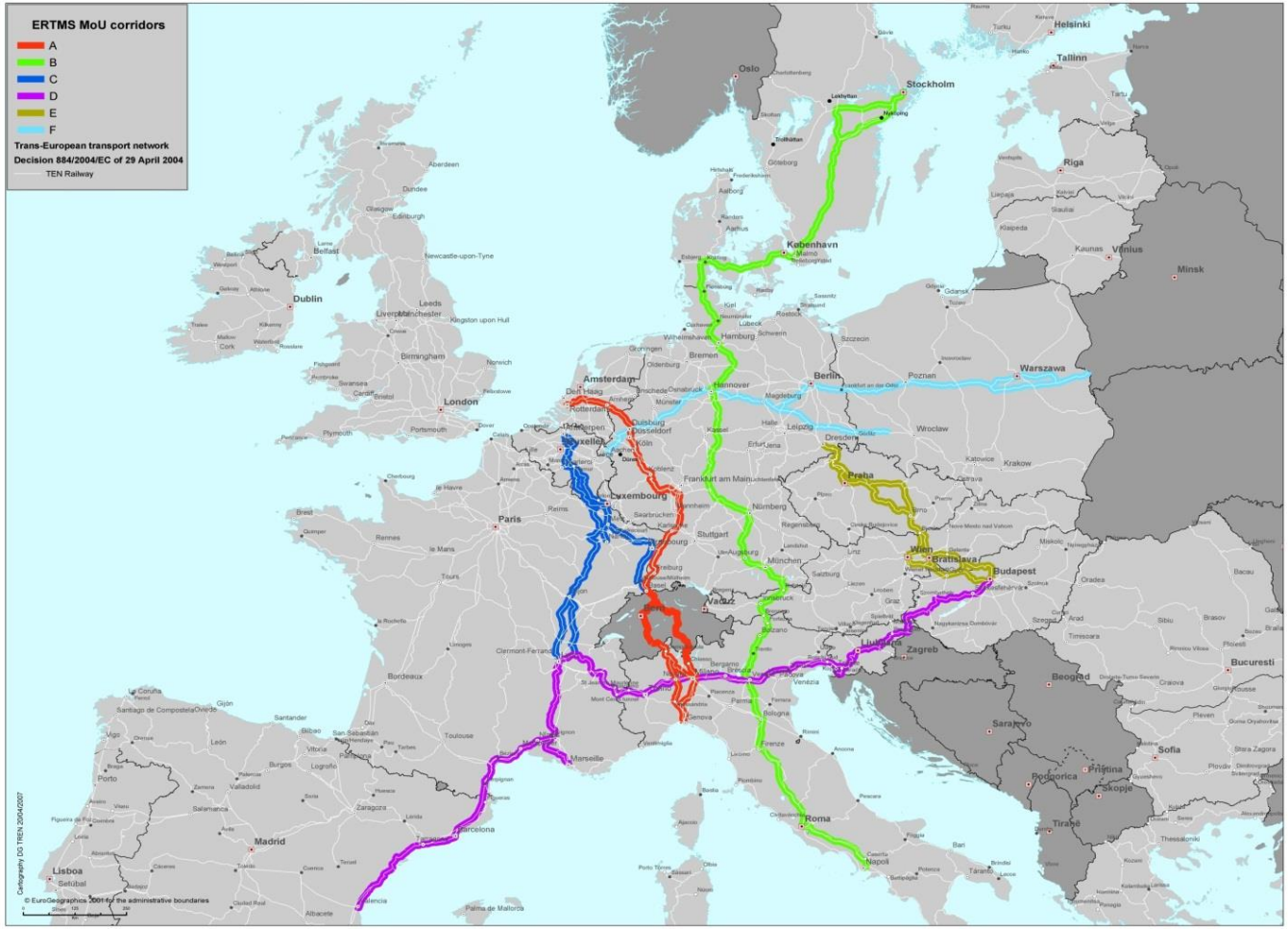
Example: ERTMS definition methodology



Validation plan

- anticipation / traceability
- compliance with the system
- ergonomic aspects
- correction
- adjustment of the system

Achievements: ERTMS standards have been defined and are being deployed in selected trans European corridors.



SYSTRA

Achievements: key elements for railway operations coordination have been defined and are being deployed (OPE, TAF/TAP and RINF TSI).

Organization

- Traffic operation and management process
- Telematics data exchange processes

Data and models

- Data model
- Unique identifiers
- Messages formats
- Code lists

Technical solutions

- Common Interface
- Reference Databases (register of infrastructure, geographical location references, etc…)

Conclusions

- Interoperability is a powerful driver for global performance of complex transport systems.
- International interoperability standards deployments can be achieved with dialogue, knowledge sharing, clear rules and political will.
- The feedback from the European integration of railway infrastructure and services can be a source of inspiration towards achieving international interoperability for ITS projects.

CONFIDENCE MOVES THE WORLD

SYSTRA