ERTMS compliant interlockings

INESS project

INtegrated European Signalling System

"FP7-SST-2007-RTD-1"

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Content

1. INESS main goals

2. How to achieve the project goals

3. Success factors

The INESS project as part of ERTMS is a unique chance for restructuring the railway signalling system with a high gain in cost reduction and performance improvements

INESS will contribute to facilitate the migration towards ETCS and to exploit the corresponding potential for cost reduction and performance improvement

INESS will introduce standard methodologies and standard solutions in the signalling field

Current situation:

Many interlockings in obsolete technology are still in use – thus there is a huge demand for renewal

No harmonised basis for procurement according to CENELEC norms

No standardised functional requirements

No standardised interfaces, especially towards ETCS level 2 and 3

Future needs:

Cost reduction over the whole life-cycle

**Increased reliability, availability and maintainability**

Increased performance

Engineering according to CENELEC principles

Compliance with ETCS in all application levels

A common format for graphical user interface data to allow the transfer of signalling project data between railway and suppliers

Infrastructure Planning

↓ LDAFF

Data Preparation Tool

↓ IDAFF

Engineering Industry
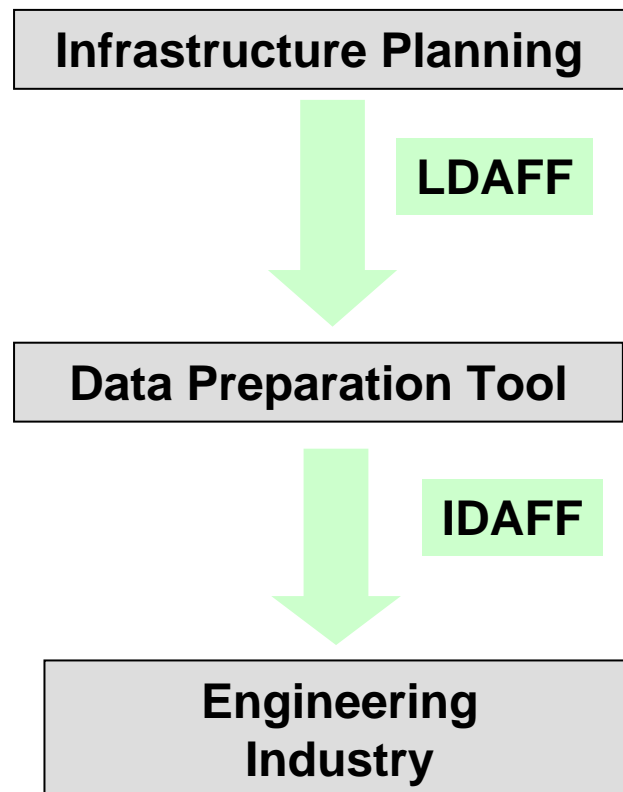
- – **Definition of LDAFF (Location Data File Format Standard)**
- – **Definition of IDAFF (Interlocking Data File Format Standard)**
- – **Check of feasibility with concrete application project and with participation of industry**
- – **Considerable potential for cost reduction has been identified**

Promote the compatibility and harmonisation of FR between railways

Two mechanisms have been identified for developing a common core of functionalities:
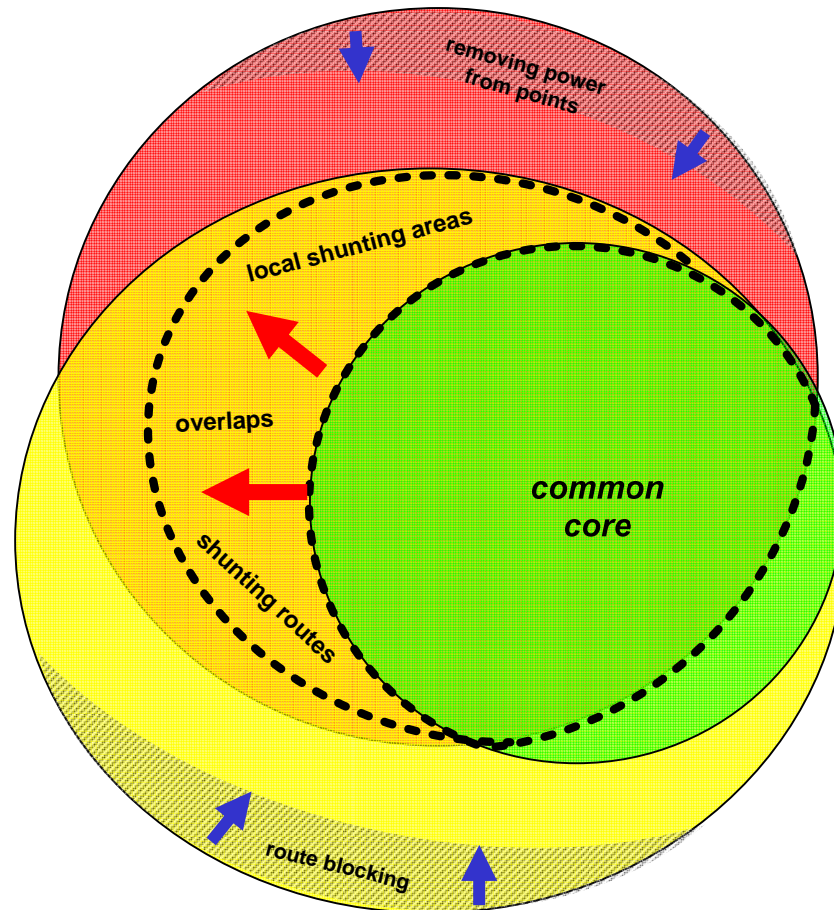
1. **Extending the core**
   - more functions would be included in the common core
   - certain functions would be redundant and not used for some railways

2. **Minimising the individual functions**
   - harmonising certain individual functions, thus moving them to the core
   - removing special individual functions

INESS in the ERTMS context

The INESS project will fill the gap regarding harmonised specifications within the ERTMS framework - Functional structure of the Rail Traffic management System and associated European Projects
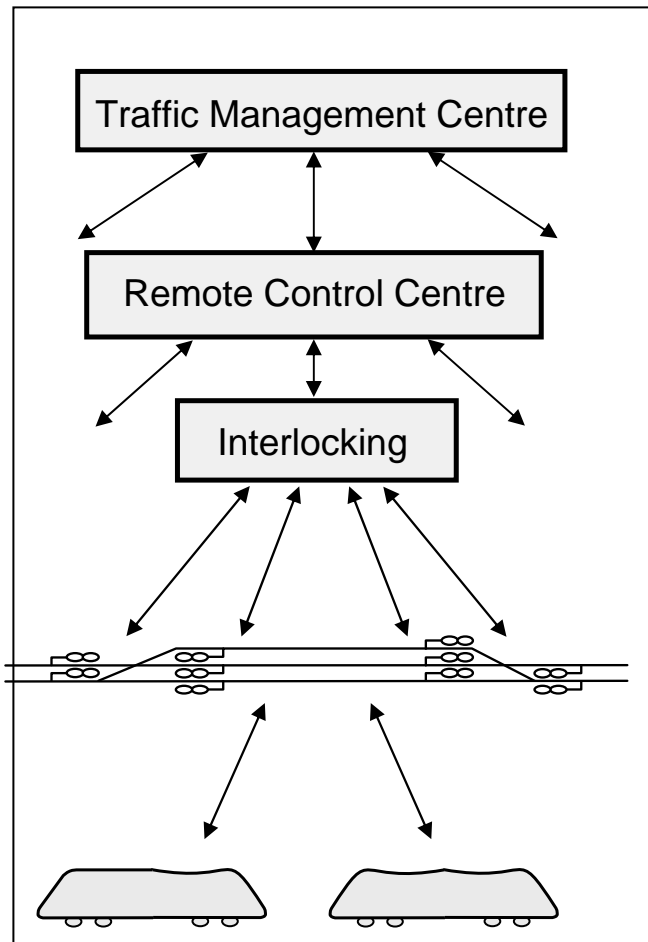
Traffic Management: *Eur-Optirails*
- *Strategic management*
- *etc.*

Signalling: *INESS Integrated European Signalling System (proposed)*
- *Remote control automated/manual*
- *Track-side occupancy proving based block control, safe route setting*
- *Control of level crossings*
- *Control of Switch points, ...*
- *Control of line side signals*
- *etc.*

Train control-command: *ETCS European Train Control System*
- *Automatic train protection and warning*
- *Automatic train command with in-cab signalling*
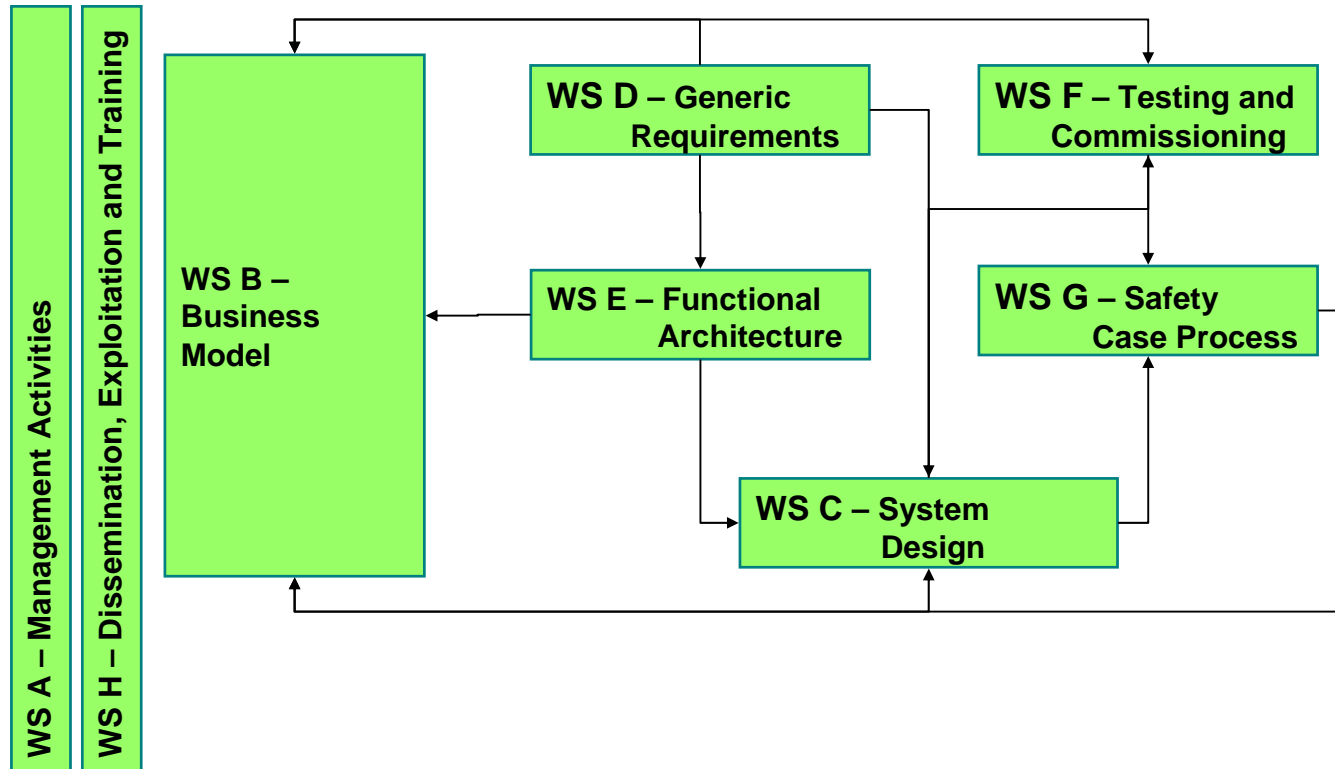- *Train-side location based block control*
- *etc.*

Railway communication: *GSM-R*
All kinds of voice and data communication

Consortium made of 30 partners UIC and UNIFE project co-ordinators

EU 7th Framework Programme for Research & Development

Main objective of Work-Stream "Business Model"

Re-engineering of the entire value chain, in order to gain cost reduction through highly efficient processes and scale effect due to rationalization and standardization for both suppliers and railway operators

Main objective of Work-Stream "System Design"

To harmonise data file formats, design tools, data transfer for production, data flows linked with system architectures and maximise the knowledge base of owned assets within the railway infrastructure

Main objective of Work-Stream "Generic Requirements"
To produce a common kernel of validated standardised functionalities including those specially required by ETCS levels 2 and 3 and to simulate their behaviour

Main objective of Work-Stream "Functional Architecture & Interfaces"
To propose an optimal functional architecture for interlockings with ETCS. Show the apportionment of functionality between the interlocking and the different sub-systems; to identify and describe the relevant functional interfaces between the interlocking and the adjacent subsystems

**Main objective of Work-Stream "Testing and Commissioning"**
To develop safety-verified test tools and techniques to enable the testing and commissioning of signalling applications, including INESS-compliant products that will be acceptable in all member states
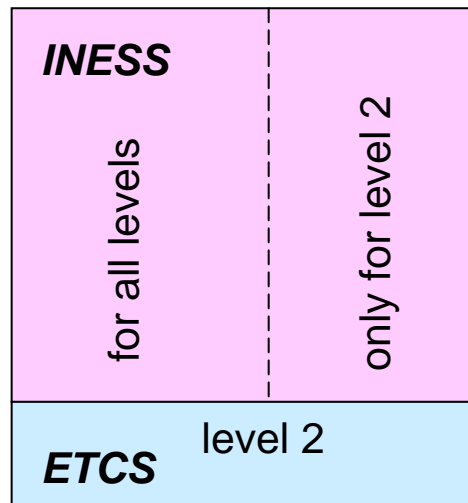
Main objective of Work-Stream "Safety Case process"
To identify an efficient way for an interpretation of the safety case process according to CENELEC and develop improvement strategies consistent to the National Safety Authorities

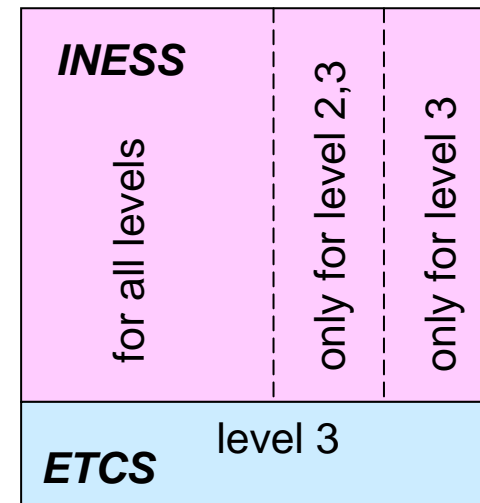**The functional architecture will be presented for each application level**

- Level 3 is the target architecture
- Functionalities belonging to level 1, 2 and 3 will be identified - It will also be shown, which parts become superfluous and which extensions are necessary. The corresponding interfaces will be openly specified
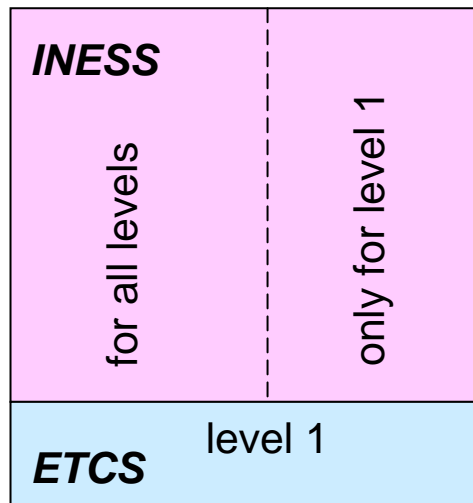
Architecture level 1   Architecture level 2   Architecture level 3

Railways will have to critically analyse their operational requirements, omit the redundant and special functionality and adjust their rules and regulations to match an agreed common kernel of future functionality

The signalling industry will have to provide creative solutions for the future signalling systems, enabling modularity, versatility and compatibility that will be required for broad implementation at various levels across Europe

The various Universities will support this process by introducing most advanced and innovative working methods and tools

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http://www.uic.asso.fr/
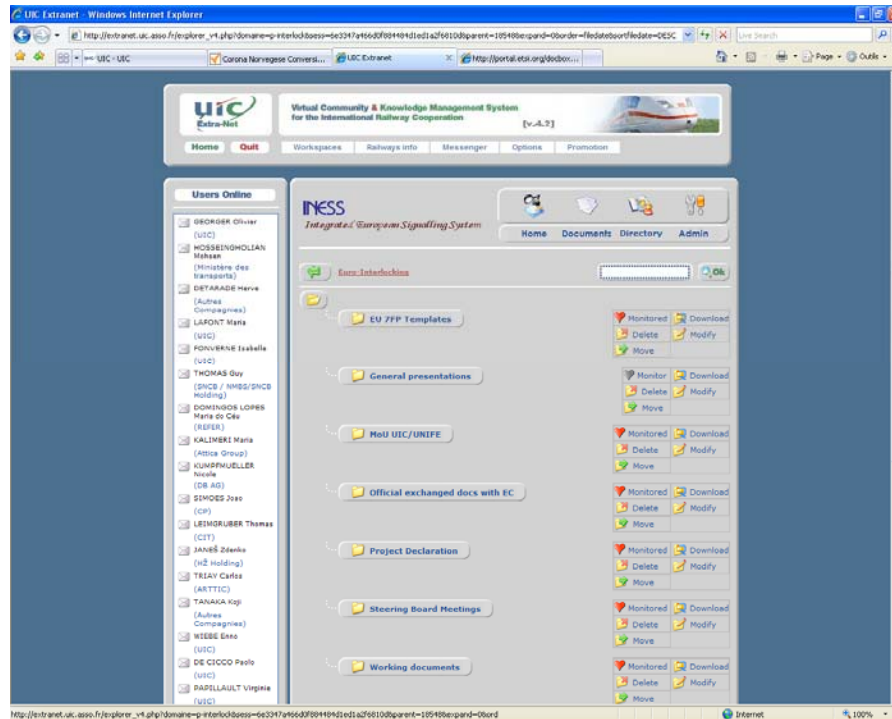
INESS WORKSPACE

UIC WEB SITE

Thank you for your kind attention
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