



UIC and UNIFE have jointly prepared and submitted an application for a collaborative project on ERTMS compliant interlockings in the EC 7<sup>th</sup> Framework Programme for Research & Development – Transport Sector – 1<sup>st</sup> call.



Delivering ERTMS compliant Interlockings

**PROJECT SCOPE**

an INtegrated European Signalling System project involving 30 partners including :

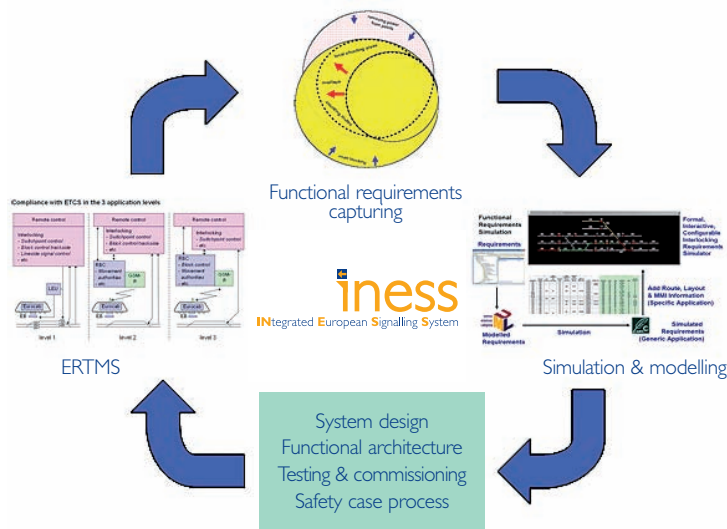
- ▶ Railways
- ▶ Industry
- ▶ Universities

Joining efforts to achieve standardization with INESS in the framework of a business model reflecting a WIN/WIN situation between partners to validate and demonstrate :



The way towards the definition & development of a common core of functional requirements for a new generation of interoperable interlocking systems:

- Suitable to be integrated in ERTMS
- Facilitating the migration
- Reducing the life cycle cost of installations



**PROJECT MANAGER**

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**PROJECT COORDINATOR**

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**INtegrated European Signalling System**

Delivering ERTMS compliant interlockings

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**Workstream B - Business Model**

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**Workstream C - System Design**

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**Workstream D - Generic Requirements**

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**Workstream E - Functional Architecture**

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**Workstream F - Testing & Commissioning**

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**Workstream G - Safety Case Process**  
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**Workstream H - Dissemination**

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### ERTMS / ETCS Level 1

#### Eurobalise without infill

- Overlay to existing signalling system
- Movement Authorities through Eurobalise
- Train integrity & position by track circuit

#### Eurobalise + infill (euroloop, radio or extra balises)

- Overlay to existing signalling system
- Movement Authorities through Eurobalise
- Train integrity & position by track circuit

### ERTMS / ETCS Level 2

#### Eurobalise + EuroRadio (GSM-R) + Radio Block Centre (RBC)

- No more trackside signals required
- Movement Authorities through GSM-R
- Train position via Eurobalise

### ERTMS / ETCS Level 3

#### Eurobalise + EuroRadio (GSM-R) + Radio Block Centre (RBC)

- Movement Authorities through GSM-R
- Train position via Eurobalise
- Train integrity onboard
- Moving block

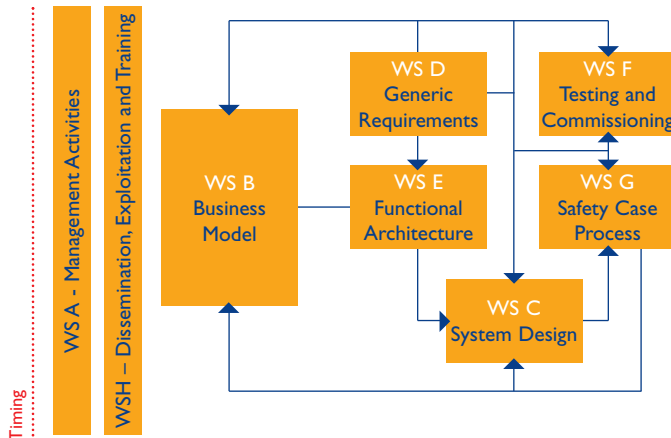
### FRAMEWORK

Until now, the interface between the interlocking and the radioblock center has not been specified as it is not directly relevant for the interoperability between track and trains. As a consequence, the various suppliers of ETCS have allocated the functions between interlockings and radioblock centres differently in their respective products, which has become a serious hindrance for the roll-out of the radio based ETCS (levels 2 and 3).

ERTMS has been strictly designed according to the system engineering principles postulated by the CENELEC norms, and which facilitate the certification, safety approval and commissioning processes.

This leads to a requirement for redesigning in the same way the adjacent parts of the signalling systems to ERTMS, especially the interlocking, which has the potential to produce a more standardised approach to the associated safety justifications for each application.

### PROJECT WORKFLOW



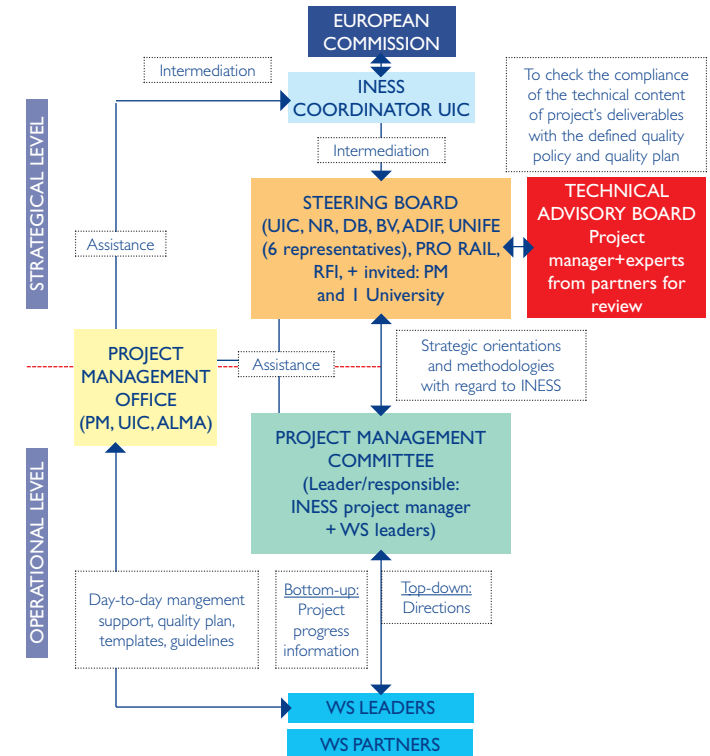
### WORK TABLE

WORKSTREAM	WORKSTREAM TITLE	TYPE OF ACTIVITY	PERSON MONTHS	START MONTH	END MONTH
A	Management	MGT	89,8	1	36
B	Business Model	RTD	126	1	36
C	System design	RTD	171,8	24	36
D	Generic requirements	RTD	317,85	2	35
E	Functional architecture	RTD	135,9	13	36
F	Testing and commissioning	RTD	86	1	36
G	Safety case process	RTD	114,5	1	33
H	Dissemination and training	OTHER	20	1	36
<b>TOTAL</b>			<b>1 061,85</b>		

### MAIN PROJECT OUTPUTS AND DELIVERABLES:

- To develop the business model and cooperation models to support migration strategies for ERTMS (WS B)
- 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 (WS C)
- To produce a common core of validated standardised functional requirements for future interlockings (WS D)
- To identify the influence of ETCS levels 2 and 3 on the functional architecture and to propose an architecture for interlockings and the adjacent subsystems (WS E)
- To provide safety-verified test tools and techniques to enable the testing and commissioning of signalling applications (WS F)
- To identify an efficient way for an interpretation of the safety case process according to the relevant CENELEC standard (WS G)

### MANAGEMENT STRUCTURE



### LIST OF THE 30 CONSORTIUM MEMBERS

UIC - UNIFE - ADIF - AZD - BV - DB - Network Rail - ProRail  
 RFI - ALMA Consulting Group - ALSTOM - ANSALDO STS -  
 BBR - Bombardier Transportation - RCS - DLR - Eindhoven  
 University of Technology - Eliop S.A. - Funkwerk IT - Invensys -  
 MerMec - Railsafe Consulting LTD - RWTH Aachen - Scheidt &  
 Bachman - Siemens AG - University of Southampton - TIFSA -  
 Thales Rail Signalling Solutions - Technical University  
 Braunschweig - University Politecnica Madrid - University of York