UIC | unife THE EUROPEAN RAIL INDUSTRY

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

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INtegrated European Signalling System

Delivering ERTMS compliant Interlockings

PROJECT SCOPE

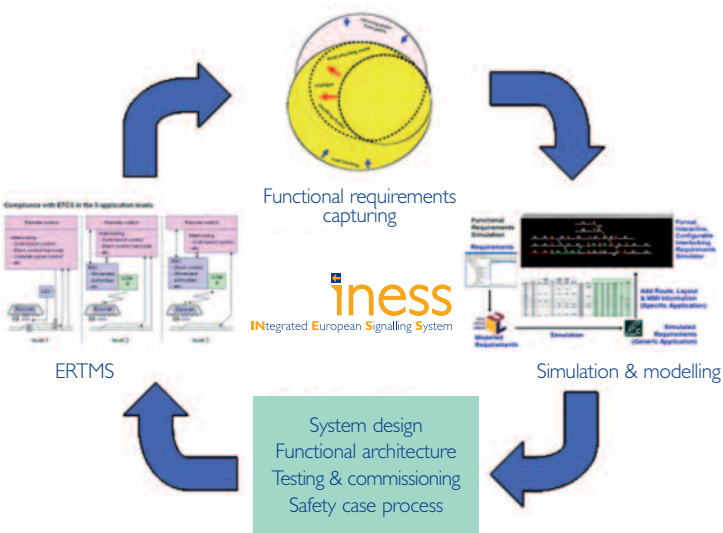an INtegrated European Signalling System project involving 30 partners including :

▶ 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

Functional requirements capturing

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ERTMS

Simulation & modelling

System design
Functional architecture
Testing & commissioning
Safety case process

PROJECT MANAGER
Emmanuel Buseyne
buseyne@uic.org

PROJECT COORDINATOR
George Barbu
barbu@uic.org

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Workstream A - Management Activities
Emmanuel Buseyne - buseyne@uic.org

Workstream B - Business Model
Karsten Kamps / Bernd Elsweiler
karsten.kamps@bahn.de / bernd.Elsweiler@bahn.de

Workstream C - System Design
Tom Stein - tom.stein@de.transport.bombardier.com

Workstream D - Generic Requirements
Wendi Mennen - wendi.mennen@prorail.nl

Workstream E - Functional Architecture
Jorge Gamelas - jorge.gamelas@trafikverket.se

Workstream F - Testing & Commissioning
Neil Barnatt - neil.barnatt@networkrail.co.uk

Workstream G - Safety Case Process
Carsten Trog / Geltmar von Buxhoeveden
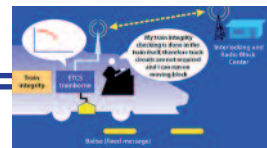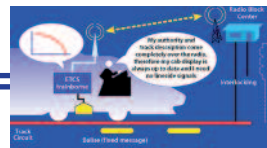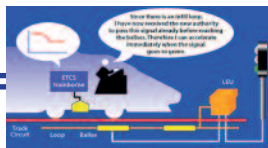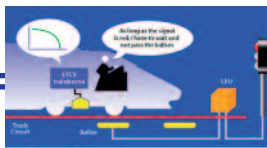carsten.trog@funkwerk-it.com / buxhoeveden@iva.ing.tu-bs.de

Workstream H - Dissemination
Maria Lafont
lafont@uic.org

UIC | unife THE EUROPEAN RAIL INDUSTRY | SEVENTH FRAMEWORK PROGRAMME

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
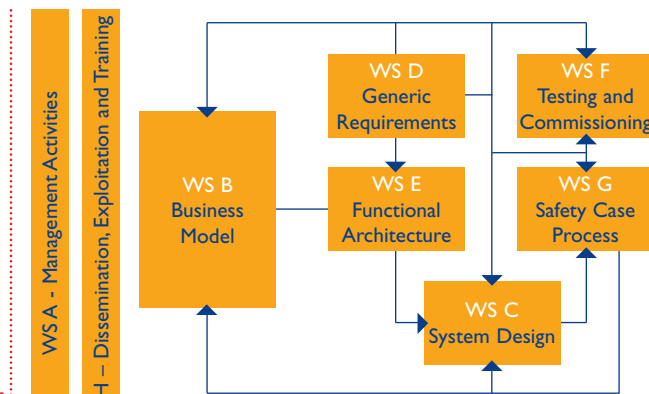
WORK TABLE

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
	TOTAL		1 061,85		

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)
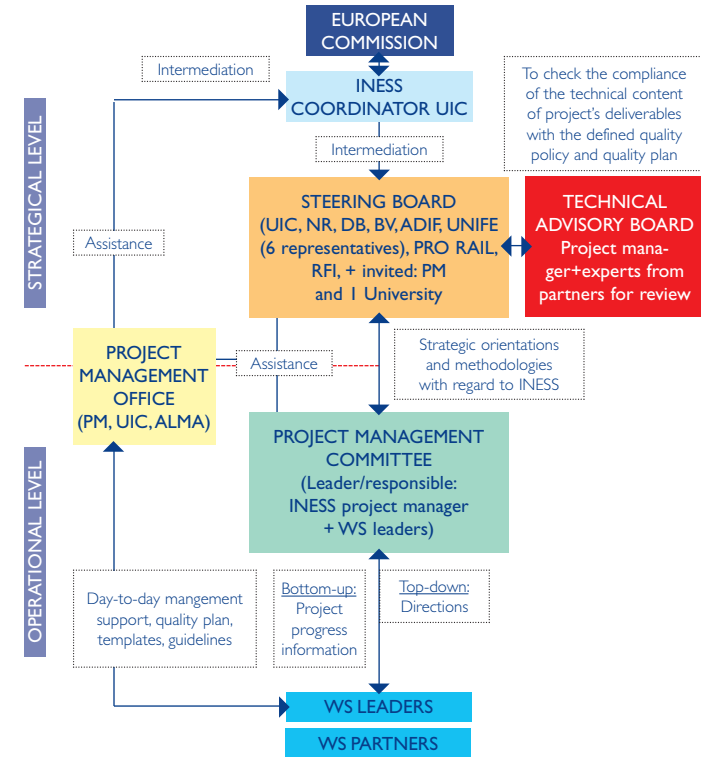
LIST OF THE 30 CONSORTIUM MEMBERS

UIC - UNIFE - ADIF - AZD - Network Rail - ProRail - RFI - ALMA Consulting Group - ALSTOM - ANSALDO STS - BBR - Bombardier Transportation RCS - DLR - Eindhoven University of Technology - 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 - Trafikverket - Nucleo - DB Netz - LaQuSo - University of Twente