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BUSINESS & TECHNOLOGY

E MAGAZINE FOR EUROPEAN RAIL DECISION MAKERS

THE MATERIAL WORLD OF COMPOSITES

VIRGIN & NTV SHARING THE PASSION

TOILET FACILITIES ROOM FOR IMPROVEMENT?

GEOLOCATION MOVEMENT MONITORING FOR EUROPORTE

BALLAST & RAILS HIGHWAY TO HIGH SPEED

SWEDEN SET TO BOOST CAPACITY WITH HALLANDÅS

INESS – DELIVERING ERTMS-COMPLIANT INTERLOCKINGS

WITH THE INESS[1] SIGNALLING PROJECT NOW AT AN END, HOPES ARE HIGH THAT ITS RESULTS WILL FAVOUR THE INTEGRATION OF ERTMS IN EUROPE. "DUE TO THE LACK OF HARMONISATION OF THE SIGNALLING SYSTEMS, ERTMS IMPLEMENTATION HAS BEEN SOMEWHAT HAMPERED," SAID JEAN-PIERRE LOUBINOUX, DIRECTOR, UIC, SPEAKING AT THE FINAL CONFERENCE IN FEBRUARY THIS YEAR. "AND WE ALL KNOW THAT AN INCOMPLETE ERTMS IMPLEMENTATION HAS NO ECONOMICAL SENSE."

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INESS facts & figures

- part of the 7th Framework Programme of the European Commission (EC) dedicated to supporting research projects
- duration: 43 months
- funding: €16.6 million: provided by the European Commission (EC) and industry partners
- 8 work streams (WS)
- total of 100 deliverables

Defining and developing a common core of functional requirements for a new generation of interoperable interlocking systems. This has been the objective of the three-year INESS – INtegrated European Signalling System – and its consortium of 30 partners (see box, p.144). "Harmonisation of the interlocking system was one of the main goals, together with reducing the associated costs of producing and installing existing and future signalling installations, and, of course, achieving ERTMS compliance," explained Emmanuel Buseyne, project manager, UIC. Indeed, the number of different signalling systems currently in use across European networks (16 on Spain's high-speed network alone) is proving a major hindrance to the roll-out of ERTMS.

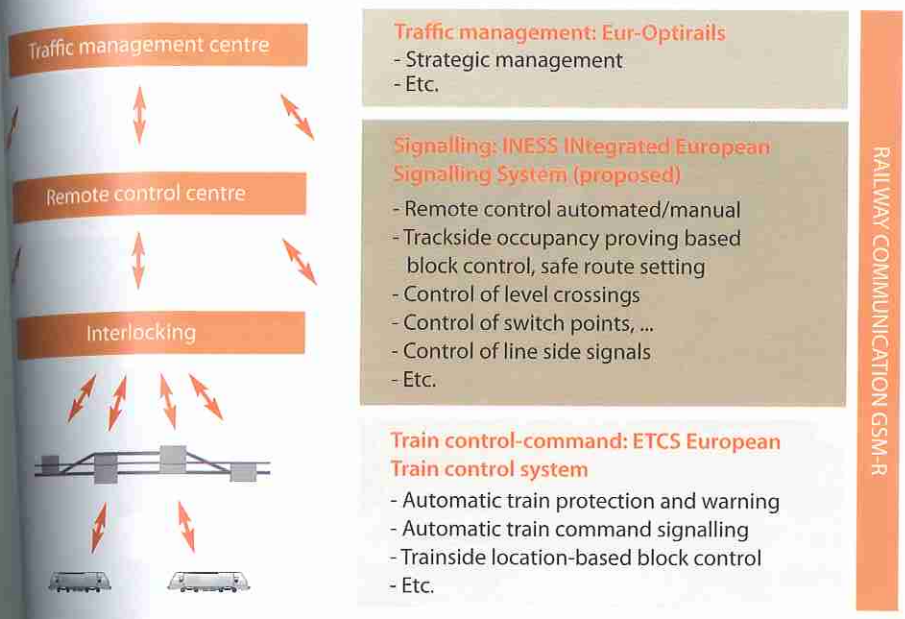
Until now, the interface between the interlocking and the radioblock centre (RBC) has not been specified since it is not directly relevant to interoperability between the track and train. Consequently the various suppliers of ETCS have allocated the functions of both differently in their respective products. And today this has become a serious barrier to the roll-out of the radio-based ETCS (Levels 1 & 2).

ERTMS has been strictly designed according to the system engineering principles of the CENELEC norms, which facilitate the certification, safety approval, and commissioning processes. This leads to a requirement for redesigning the adjacent parts of the signalling systems to ERTMS, particularly the interlocking, which has the potential to produce a more standardised approach to the associated safety justifications for each application.

If an ERTMS-compliant signalling system were to exist, it would undoubtedly represent a huge step towards enhancing the efficiency of Europe's rail network. At last trains would be able to cross all borders without any trackside compatibility interference caused by the mix of national signalling systems. Furthermore, the communications and protocols between border railway traffic control systems would be facilitated and secured.

STEERING & OPERATIONAL LEVELS

The partners are a mixed team of industry and railways, universities, research institutes, consultants, and specialists. At the strategic level, the steering board comprises six railways – Deutsche Bahn (DB), ProRail, Network Rail, Trafikverket, Adif, and the Swedish National Rail Administration (BV Sweden) – six industrials, and the UIC as coordinator. In parallel, the operational (technical implementation) level is divided into the following seven work streams (WS): **business model; data model; common**



ESS in the ERTMS context: outline of the functional structure of the Rail Traffic Management System (left) & associated ropean projects (right)

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and modeling; sys-chitecture and FFFIS; and commissioning; case process; dissemi-exploitation, training, cking.

siness model – leader:

luating of the effects her WS, the group results into a busi-el that will allow to calculate their make an estimation of migration that is adopt the new sys-the first year, this ally involved un-

derstanding the markets and analysing their different status quo, in the second, the effects of the other WS regarding a LCC impact were explored. And finally, in 2011, a model was developed to illustrate and simulate key mechanisms of the European signalling market.

WS C: System design – leader: Bombardier

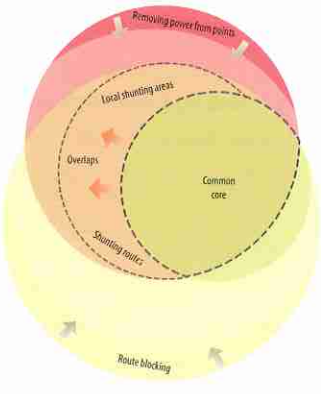
The main objective here was to describe a European Unified Data Model for Railway Infrastructures (EUDRI) for the data flow into an interlocking system. This EUDRI data file format has been designed to be compatible with existing design and interlocking configuration tools to truly facilitate the process of transmitting railway information to the industry. It shall enable data transfer for calls to tender, and the production and implementation of an INESS-compliant interlocking, thus supporting the data flows linked to the INESS system architecture. Furthermore, the contained data can also be used to maximise the knowledge base of owned assets within the railway infrastructure.

After selecting the best-suited data model, RailML, and describing the already recognised (major) gaps, the requirements were put to the test by suppliers and railway companies. The results produced a precise list of gaps and a verification of the work completed so far.

WS D: common kernel & modeling – leader: ProRail

The main objectives were twofold:

- to define a common kernel of validated, standardised functionalities for future interlockings, including functionalities specially required by ERTMS Levels 2 and 3, and which are capable of supporting the common operational requirements of the various railways
- to define standardised and optimised methods and tools for managing the requirements, plus for verification and validation purposes.

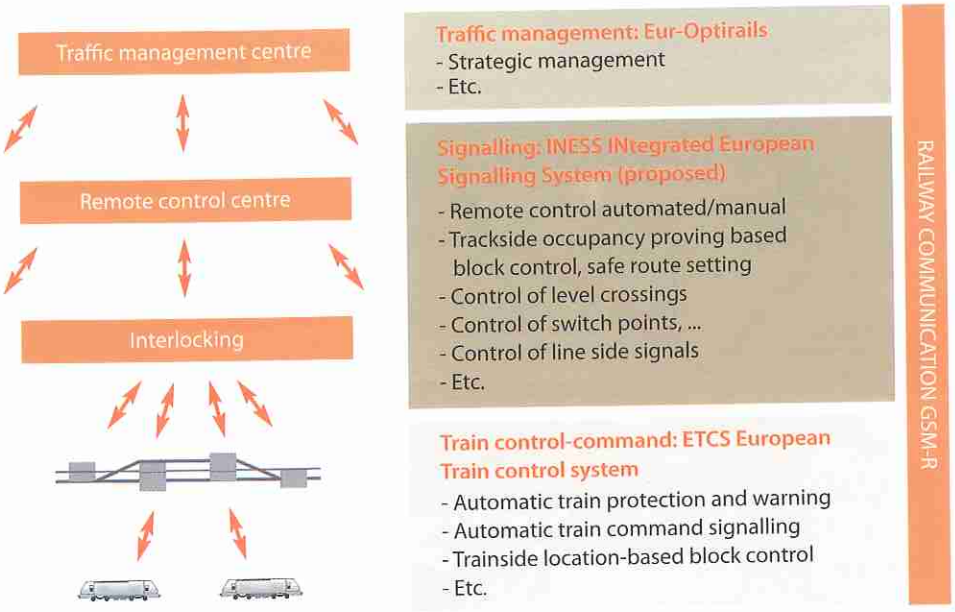


Common core methodology

Two mechanisms for developing the common core:

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
> removing special individual functions
> harmonising certain individual functions, thus moving them to the core



INESS in the ERTMS context: outline of the functional structure of the Rail Traffic Management System (left) & associated European projects (right)

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kernel and modeling; system architecture and FFFIS; testing and commissioning; safety case process; dissemination, exploitation, training, and coaching.

WS B: business model – leader: DB Netz

After evaluating of the effects of the other WS, the group worked the results into a business model that will allow companies to calculate their costs and make an estimation of any kind of migration that is needed to adopt the new systems. During the first year, this work essentially involved understanding the markets and analysing their different status quo, in the second, the effects of the other WS regarding a LCC impact were explored. And finally, in 2011, a model was developed to illustrate and simulate key mechanisms of the European signalling market.

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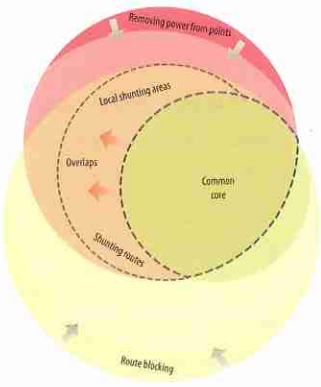

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