

UNIFE and ERTMS/ETCS

The European Railway Traffic Management Systems / European Train Control System is ready, available and working

ERTMS/ETCS Commercial Projects

ERTMS/ETCS Pilot Projects



FOL
10 -05- 002

Why ERTMS/ETCS?

ERTMS/ETCS, the European Railway Traffic Management System, has been designed by the European railway industry and operators, supported by the European Commission, to meet the documented needs of the European Railways.

The work of the European Railways resulted in a specification to enable operational interoperability through out Europe. The work of industry has been to ensure technical interoperability between different suppliers in order to create an open market in equipment supply.

The past and current situation in signaling is that each country has one or more systems.



This means:

- Each railway depends on one system, generally supplied by nationally based companies. This has resulted in a lack of real competition.
- Each system was developed for one particular market, according to national specifications: this led to a lack of economies of scale and expensive systems
- Trains for cross-border operations have to be fitted with all systems they are likely to meet on their journey (eg: Thalys, with six systems on board): this is costly and significantly increase the technical and operational complexity. Thus it was only specially equipped trains that could cross borders.
- Cross-border operations are traditionally hindered, with locomotives and drivers having to be changed at the border, therefore preventing rail transport from meeting the consumers' expectations and improving the market share of rail with respect to other modes of transport.




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Implementation of ERTMS/ETCS will promote:

1.

Railway Interoperability

ERTMS/ETCS operates under rules defined by the European railway authorities: it is able to operate across national boundaries. Furthermore, trains equipped with ERTMS/ETCS, manufactured by any supplier, are able to run on any track equipped with ERTMS/ETCS by any other supplier. Therefore, the combination of operational and technical interoperability enables rail transport to deliver services matching the customers' expectations and promotes the modal shift from road to rail as required by the European Union.

2.

Railway Safety

ERTMS/ETCS improves safety by providing a comprehensive Automatic Train Protection (ATP) function, where it does not already exist. This coupled with the flexibility of ERTMS/ETCS which can be applied to low-density lines as well as high-density lines is especially important for countries where ATP systems are not widely deployed. Thus, ERTMS/ETCS is a major contributor to improving the overall safety record of the European railways. Providing an ATP also enables to increase the capacity of the network.

3.

Railway Capacity

ERTMS/ETCS has three levels², which provide a clear and cost effective migratory path in support of a need to increase network capacity. Level two facilitates the largest increase in traffic capacity but in certain cases, level 1 could also provide capacity benefits. These three levels enable to upgrade the signaling system to accommodate increasing traffic in a cost-effective manner.

This extra capacity will immediately be available, whereas construction of new lines will take a decade to impact rail transport. It will enable to increase the number of services on the most-used infrastructure, enabling rail to capture a larger share of the transportation market and operating companies to improve the use of their assets by providing more connections.

It is estimated that when ERTMS/ETCS is fully integrated with systems such as full fleet management and traffic monitoring it will be possible to increase traffic capacity by between 10% and 30%³.

4.

Railway Availability

ERTMS/ETCS is a standardised system. This implies that it is product that is proven in many applications resulting in a higher reliability and higher availability than current tailored-made systems.

As it represents a new generation of systems that can be provided by different manufacturers its connections and interfaces have been standardised and simplified. Also, with the integration of these new technologies ERTMS/ETCS is able to provide advanced maintenance and tele-diagnostics facilities.

¹ levels one and two are available, level 3 will be developed based on the experience accumulated with level 2

² Oskar Stalder and Arnold Trümpi, SBB, Bern, Switzerland, in Signal&Draht March 2003

5.

Cost-effectiveness

As the unique signaling system for Europe, ERTMS/ETCS benefits firstly from economies of scale and the production cost of the system are being lowered.

Secondly, there is also an impact on maintenance, where in the longer term, only having ERTMS/ETCS to maintain as opposed to a variety of ATP systems will sensibly ease maintenance costs, thus lowering the operational cost of ownership.

As a result, the Life-Cycle Cost of ERTMS/ETCS will be significantly lower than for current signaling systems and therefore tending to improve the cost structure of railway system as a whole.

6.

Less on-board equipment

Currently, at least one signaling system must be installed on-board for each country a train has to cross. ERTMS/ETCS will therefore remove this constraint, with only one on-board computer and one Man-Machine Interface (MMI).

This will also lower costs and ease pressure on the limited space available in locomotive as well as reducing manufacturing and operational complexity of new rolling stock.

7.

Open Market

Technical Interoperability between products from different suppliers designed to meet the harmonised requirements of the railways creates an open market for signaling systems in Europe. This will increase competition between suppliers and further reduce costs.

Any railway will be able to purchase anywhere in Europe and all suppliers will be able to bid everywhere. Having a standard system will reduce the contract-lead time due to the elimination of bespoke engineering.

ERTMS/ETCS products, being standard, will also undergo one certification process and a simplified approval process in Europe, greatly reducing the certification costs traditionally associated with the introduction of new systems.



ERTMS/ETCS deployment in Europe



The ERTMS/ETCS installation requires an optimised migration strategy that takes account of future traffic growth projections and of the existing installed asset base. The installation of ERTMS on the complete European network has been estimated to be within 3 to 6 billions euros³.

The costs related to the installation of ERTMS/ETCS are ultimately justified by the benefits it brings in terms of lower life-cycle cost, safety, extra capacity and international interoperability.



ETCS is the new control-command system that together with GSM-R forms ERTMS, the new signaling and management system for Europe, enabling interoperability throughout the European Rail Network.

Twelve countries are committed to ERTMS/ETCS and over twenty contracts have been let. ERTMS/ETCS is already in revenue service with proven technology on two lines, level 1 in Bulgaria and the advanced level 2 system in Switzerland⁴.

The technical specifications of ERTMS/ETCS were officially signed in April 2000 by the railways and the industry, adopted by the Member States of the European Union in December 2001 and published in the Official Journal of the European Communities.

This was made possible thanks to the experience accumulated on a number of test tracks where the suppliers' products were tested, enabling them to verify the specifications for ERTMS/ETCS levels 1 and 2.

GSM-R, the radio communication system for railways, will be installed in all European countries as a basis for ERTMS/ETCS level 2.

³ A detailed estimate is not possible due to the impact of project-specific costs, such as: line availability, retrofitting of existing rolling stock etc.

⁴ This system is based on the ETCS specifications at version 2.0.0, while the current specifications are at version 2.2.2. Therefore, SBB, satisfied with the experience acquired in this project, has decided to revert this line to conventional signaling and to focus its engineering resources on the next steps of its national migration plan to ERTMS/ETCS

ERTMS/ETCS Suppliers



ALSTOM

ANSALDO SIGNAL
A Finmeccanica Company

BOMBARDIER
TRANSPORTATION



SIEMENS

GSM-R Partners

ALSTOM

HÖRMANN FWK
ELNICHWERK KOLLEDA, GMBH

kapsch >>>

Marconi

NORTEL
NETWORKS



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