

Signal

the European Rail Traffic Management System

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Also included in this issue:

- Testing p3
- ERTMS in Poland p4
- Upcoming events p4



In the previous edition of *Signal* we reported on the European Railway Agency and its mission to support the development of a modern railway system that is unrestricted by national borders. The Agency is focusing in particular on ensuring the operational interoperability of ERTMS: the latest *Signal* takes a closer look at this key issue.

We would also like to take this opportunity to offer our readers our very best wishes for the festive season and we look forward to seeing you again for (an ERTMS-packed!) 2009...

The Signal team

Towards operational harmonisation

Railway operations require increasingly complex technological support and systems, but the most significant role in the performance of ERTMS is that of human intervention. GSM-R phones and ETCS (European Train Control System) equipment on board trains function across borders and on different infrastructures; operational harmonisation, however, will enable train drivers to use and interact with that standard technology in a reliable, predictable, and specific manner.

To reach this objective, different operational situations are analysed from the perspective of a person doing a job. High quality service can be delivered by ensuring overall consistency between the behaviour of the technical system, its interface with the driver and the operational rules to be applied in each operational situation. A harmonised technical system alone is not sufficient to get the expected quality of service: a certain number of additional activities concerning operation need to be taken into consideration.

The situation today

As an example, the GSM-R (Global System for Mobile Communications – Railway) system offers the standardised function to launch an emergency call to the driver. When receiving the call in country A the driver may have to brake immediately and bring the train to a standstill; in country B, in the same situation, the driver may only have to ‘run on sight’ or reduce the train’s speed... This example shows how important operational harmonisation is, especially in this case of a potential emergency situation which requires semi-reflex actions from the driver. Thanks to their harmonised onboard systems, ERTMS trains are able to cross borders; however, we also have to consider that these trains operate in different national environments. The difficulty is therefore in identifying the range of operational situations to be harmonised; a functional approach to rail operation will detect these limits. →

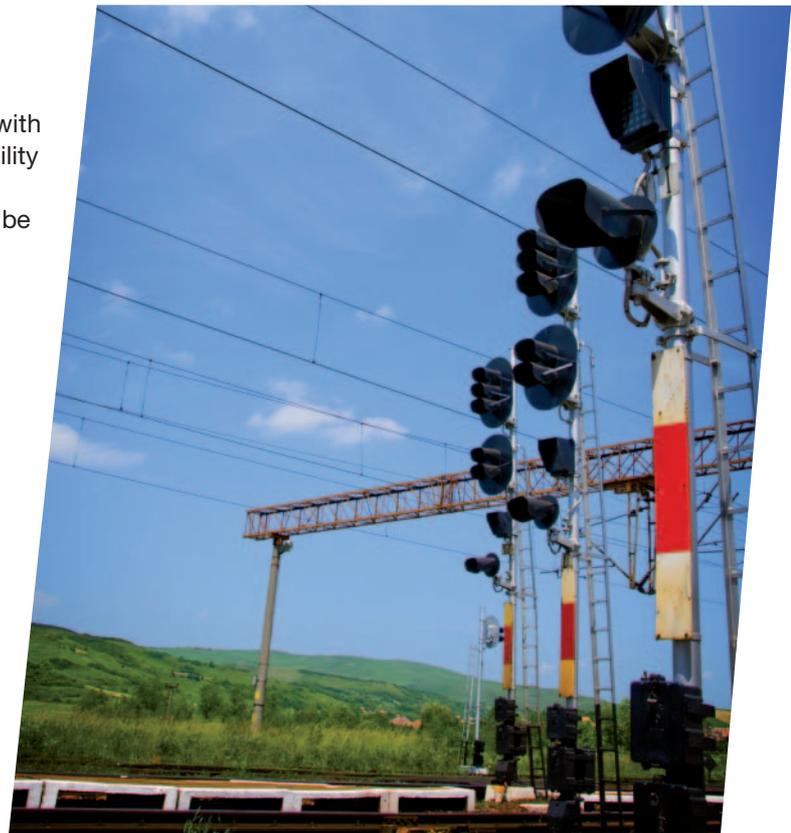


Next steps

The following activities must be carried out with a view to ensuring the operational interoperability of ERTMS:

- functional requirements of the system should be based on agreed operating principles;
- engineering rules and their impact should be considered in order to limit divergence and to avoid multiplication of different operational situations;
- specifications of the interface between the driver and the system (Driver Machine Interface – DMI) should be harmonised, taking into account possible harmonisation of the trackside ‘boards’ (fixed panel indications);
- consolidation of the harmonised operational rules and their insertion into the driver’s rulebook.

A ‘Human Factor approach’ will be employed from the beginning of these different activities and a validation plan will ensure consolidation of the harmonised operational rules.



Cab Simulator – courtesy DLR

The way forward

To set up the most efficient process, operational activities are coordinated within the framework of a European Railway Agency (ERA) Working Party on ‘Operational Harmonisation of ERTMS’ created in September 2008. The excellent level of participation has demonstrated the interest of the sector organisations in this topic. The Working Party’s activities are carried out in close cooperation with the Agency’s ‘Traffic Operation and Management TSI (Technical Specifications for Interoperability)’ Working Party. All the results will be submitted to the ERA Control Group in the framework of the ERA Change Control Management process for ERTMS. Results will enable ERTMS to deliver not only the benefits of a standardised technical system but also successful seamless operations which will enhance railway transport.



Interlocking Operator Station – courtesy DLR



Test Labs: enhancing ERTMS testing

All players in the rail sector agree: the ERTMS testing strategy must be improved and made more effective. The increase in the number of lines and international connections, the large number of manufacturers, and the availability – prospectively for 2012 – of a new version of the specifications all argue in favour of strengthening testing significantly.

The European Commission is working with the sector on three complementary tracks:

- optimising the use of existing laboratories;
- examining the added value of test centres;
- defining a strategy of tests linked among existing lines.

The emphasis will be on the laboratories. It is here that interoperability can be tested most effectively. The idea is simply to test the ERTMS computer installed on trains in a laboratory capable of simulating scenarios for all existing lines in Europe.

As it stands the tests make it possible to check whether the on-board computer respects the specifications of each and every line. However, it is difficult to guarantee by way of testing procedures that the specifications cover all possible cases and configurations. This is why, even if an on-board computer has passed all the tests, there is still a risk that there will be some difficulties on a certain line. On the other hand, once a line is equipped with ERTMS, it is necessary to ensure its compatibility with the products of all the manufacturers.

The gradual improvement of the specifications has reduced the risk of incompatibility. Nevertheless, for a new project, the manufacturer's main concern will not always be to check the compatibility of the chosen solution with the products developed by its competitors.

Testing the compatibility of each new on-board computer with all test scenarios for existing lines and testing all new lines with the existing on-board computers is only possible if the European Railway Agency makes proposals and takes the lead to improve testing procedures as these currently take too long. It is in the interests of each actor to contribute to this

strategy which must also involve notified bodies and safety authorities:

- the infrastructure managers should provide a precise description of their lines so that they can be integrated into the databases of the laboratories;
- the laboratories should establish a common database capable of integrating these scenarios in addition to the test specifications;
- the manufacturers should ensure that a prototype is made available.

A constructive and effective collaboration is expected on the part of the manufacturers because the aforementioned programme is also in their interests.



Eurocab Laboratory – courtesy CEDEX Rail Research Laboratory

ERTMS Deployment in Poland

The Polish national ERTMS Deployment Plan foresees a strict schedule for the implementation of ERTMS in Poland. Steps are now underway to begin works to install the first ERTMS equipment in the country. The Plan foresees ERTMS implementation along 84 km of the key E30 line – on the section from the German border to Legnica, which is the Polish pilot section of ERTMS Corridor F – as well as 224 km on the E65 CMK line – on the section from Grodzisk Mazowiecki to Zawiercie, which is a convenient connection between Warsaw and Kraków/Katowice and a major line for passenger transport. Implementation of ERTMS on the E65 line, which currently has technical but not signalling capacity to sustain operations with a speed of 200 km/h, will allow an increase of operational speed.

A tender to carry out these first Polish ERTMS projects will be launched by the end of the year. The tender involves implementation of ETCS Level 2 on the E30 line and ETCS Level 1 on the E65. The ultimate aim is to achieve full technical compatibility between ERTMS projects, taking into account the harmonisation of ERTMS operational rules, the cross-acceptance of traction rolling stock, the inclusion of STMs, as well as the cross-acceptance of train drivers' competences and common operational languages. ERTMS is expected to be operational in 2012 on the E65 CMK line from Warsaw to Kraków/Katowice and in 2013 on the Corridor F pilot line.

ERTMS diary

- 19 January, 2009: Brussels ERTMS MoU Steering Committee
- 18 February, 2009: Prague Czech Presidency Conference on ERTMS Corridors
- 19 February, 2009: Prague ERTMS Corridor Group
- 4-5 March, 2009: Brussels Committee on the Interoperability and Safety of the European Railway System

Please send us your dates!

POLISH RAILWAY NETWORK

Map only shows double-track lines of the network



For further information on ERTMS, see: http://ec.europa.eu/transport/rail/interoperability/ertms/ertms_en.htm

To view previous editions of *Signal*, click: http://ec.europa.eu/transport/rail/interoperability/ertms/newsletter_en.htm

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