The newsletter of ERTMS

signal

the European Rail Traffic Management System

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Also included in this issue:

Welcome back after the summer break. Groups appear to be the theme of this issue of *Signal,* with contributions from Andrea Querzè of the ERTMS Users Group and Ola Bergman of the GSM-R Industry Group. Continuing the journey of previous issues, we also take a look at Corridor D.

The Signal team

Spotlight on the ERTMS Users Group

The ERTMS Users Group is a European Economic Interest Group established in 1995 by the national railways of France, Germany and Italy. In subsequent years its membership increased and the group currently consists of the infrastructure managers: ADIF (Spain), Banverket (Sweden), DB (Germany), Network Rail (UK), Prorail (Netherlands), RFF (France), RFI (Italy) and SBB (Switzerland) as cooperating partner.

Initially funded under the EU Research Framework Programme and then under the TEN-T multi-annual programme, the ERTMS Users Group has always been instrumental in developing and validating ERTMS, in particular the European Train Control System (ETCS).

After taking over responsibility for the technical specifications written by the Union internationale des chemins de fer (UIC), one of the Users Group's first tasks was to find a balance between the complexity of the technical specifications and the flexibility of the system.

The turning point was to use such specifications in the development of pilot projects in the various countries (initially in France, Germany and Italy). In a remarkable show of coordination and speed, calls for tender were launched and contracts awarded by the members of the Users Group. As a result, suppliers turned paper specifications into industrial products and system installations, demonstrating the feasibility and capability of the system.

The pilot projects clearly showed that ETCS could fit different trackside configurations without the need for infrastructure upgrades.

The second challenge was to demonstrate that the system was sufficiently simple and robust to ensure interoperability between on-board and trackside systems even when they had been implemented by different manufacturers.

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The initial idea was to carry out cross tests by exchanging locomotives between the pilot projects. In summer 1998, concerns were growing that the ERTMS/ETCS solutions offered by different manufacturers for the trial sites might not be fully interoperable. To tackle the problem, the main signalling manufacturers were invited to form a group – UNISIG – and to improve the ETCS technical specifications.

The ERTMS Users Group then acted as 'technical counterpart' to the manufacturers and ensured that railway requirements and operational needs were duly taken into account by the manufacturers.

However, the structure and terms of the ERTMS Users Group did not enable it to fully control the growing number of national projects and to ensure that the use of the UNISIG specifications ensured technical interoperability among the various projects.

Now that the European Railway Agency (ERA) is fully operational and its role as ERTMS system authority is established, the role and responsibility of the ERTMS Users Group are reverting to its original mission: facilitating the technical interoperability of projects. Experience has shown that cross tests involving locomotives are necessary, but are not the most appropriate way to test complex situations which may affect the interoperability of the solutions engineered by different manufacturers.

For this reason, one of the main roles of the ERTMS Users Group is to collect a set of functional scenarios to be used in lab test campaigns, under the supervision of ERA and with the collaboration of the corridor organisations and manufacturers.

In such a way, the ERTMS Users Group plays a fundamental role in the process which will lead to the realisation of European-wide compatible on-board equipment, avoiding the need to repeat the same tests in different countries.

Andrea Querzè
Managing Director ERTMS Users Group

GSM-R: the way forward

*by **Ola Bergman**, GSM-R Industry Group*

GSM-R is a success. Since the start in 2000, the voice services of GSM-R for efficient train operation have been successfully used in many countries and by rail operators all over the world! Indeed GSM-R has spread to all continents – only North America is yet to decide on a wireless radio system suitable for their recently announced US passenger high-speed programme.

As a platform for ETCS Levels 2 and 3, GSM-R must be available before operation of either can commence. For the ETCS rollout in Europe over the coming years, GSM-R coverage is almost complete, while for any missing parts projects are ongoing or advanced planning is in place. This achievement has been due in part to the flexibility of the GSM-R system to facilitate continual improvements to meet railway operators' needs and the ability to swap subsystems, enabling competition.

To ensure the continued success of GSM-R, various important activities are ongoing or planned, some of which are outlined below.

Improving capacity and quality

GSM-R only employs the 4 MHz band immediately adjacent to the 35 MHz band used by public GSM and Universal Mobile Telecommunication System (UMTS) operators in the 900 MHz frequency band. The current bandwidth and frequency range pose a challenge for delivering GSM-R services in two areas:

- comparatively GSM-R has rather limited capacity to operate many concurrent speech and data connections in a limited area, in a 'hot spot';
- disturbing radio influences between GSM-R and the public services such as interference must be controlled.

A number of studies are ongoing or planned to address these challenges. To give GSM-R more capacity, the possibility to use the packet-switched capabilities of GSM-R – i.e. GPRS – is being investigated. This would enable the available 4MHz band to be optimised.

Another option is to use 'Half Rate' for voice services, in particular for group calls which may run for a long duration. Half Rate would roughly double the capacity of GSM-R to support such group calls. A further possibility is to enlarge the 4 MHz band allocated to GSM-R; however, this would require equipment to be modified and raises technical challenges as regards possible interference with public GSM.

Enhancing functionality

A 'borderless' Europe for railway operation is the vision behind the creation of the ERTMS. In practice, this means that the action needed for a train to switch from one GSM-R network to another when crossing a national border must be minimised. Work is therefore ongoing to identify how GSM-R can be improved to shorten the time needed and the driver's efforts for 're-registration'; this occurs when the train de-registers from the GSM-R network it is leaving and then registers onto the network it is entering.

Shunting is a very common and frequent task in any railway operation. GSM-R must thus provide adequate and easy-to-use communications to support this. Revised shunting specifications that better meet the needs of many railways have recently been completed.

An essential function of GSM-R, the Railway Emergency Call (REC) allows an emergency call to be broadcast to all trains within a given geographical area. This feature is being enhanced (the Enhanced Railway Emergency Call, eREC) in order for the emergency call to be sent only to trains that might enter in the 'operational sector' where danger has been detected. As such, not all trains in the geographical area will be stopped – but rather only those that really need to stop – thus increasing operational efficiency.

Ensuring interoperability

Interoperability is the cornerstone of ERTMS. For GSM-R, the interoperability between the trackside network and the on-board radio is fundamental to the co-function of interconnected GSM-R networks.

The 'interchangeability' of certain subsystems within a network is required to enhance competition. These 'inters' need to be ensured in a multivendor environment and when GSM-R specifications – i.e. EIRENE – are upgraded to incorporate new functionalities.

It is also essential to perform the required testing and certification work to high-quality and cost-effective standards – in particular not to redo work in each country but rather to rely on achievements at European level as far as possible.

A streamlined European process is required. This process (System Version Management) not only ensures the safe introduction of new functionalities into a European GSM-R network but also protects individual railway operators from the risks and costs of being a 'first implementer' of such functionality. Together with the European Railway Agency, the GSM-R Industry Group is establishing common grounds for a European System Version Management.

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Corridor D: working to move freight to rail

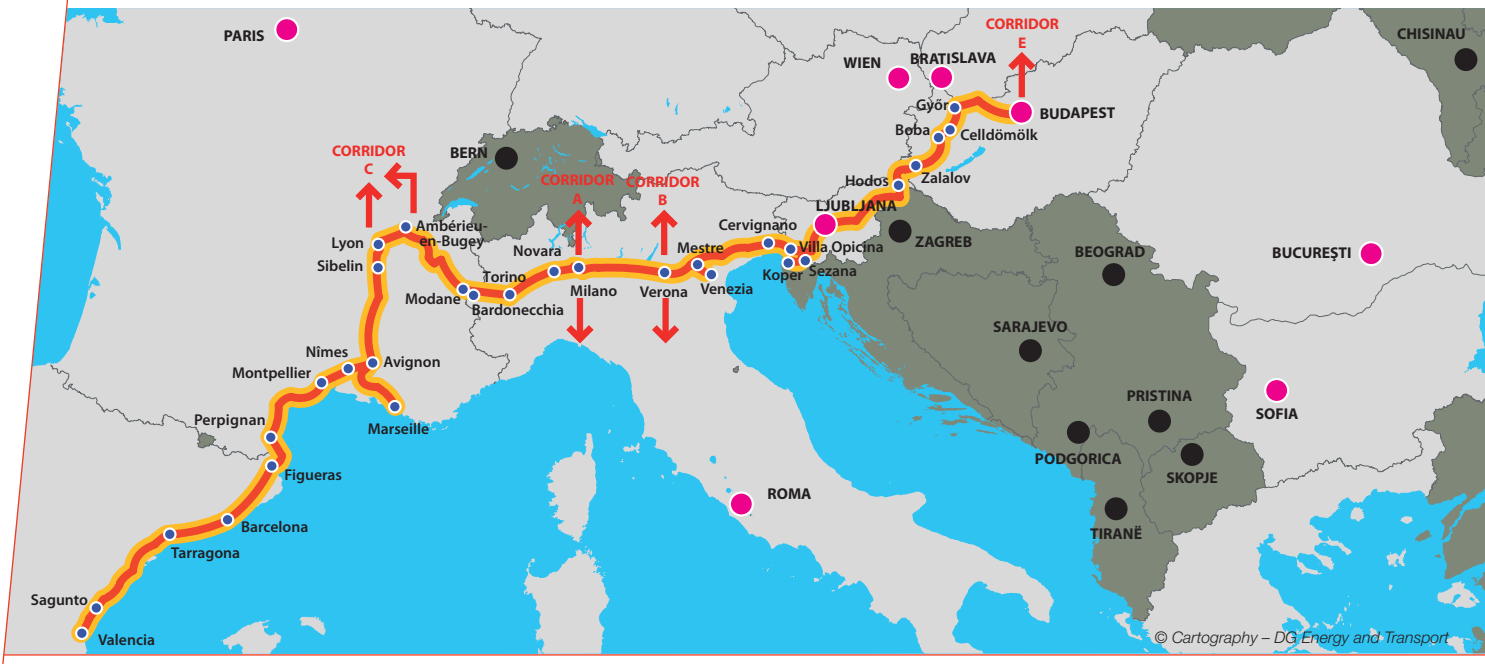
The Corridor D project (Valencia–Lyon–Torino–Ljubljana–Budapest) aims at promoting the creation of an efficient rail freight axis in Europe. It encourages modal shift of freight from road to rail, with the goal of helping to achieve the EU's sustainable development objectives.

To facilitate the coordination of the project, the railway infrastructure managers of Spain (ADIF), France (RFF), Italy (RFI) and Slovenia (SZ) set up a European Economic Interest Grouping (EEIG) in July 2007. Hungary's MAV, Spain's TP Ferro and a number of concerned railway undertakings also take part in the EEIG activities.

Corridor D's objectives are to:

- **develop the technical interoperability, as a first step, by deploying ERTMS** – the infrastructure managers and ministries involved in the project have all agreed to implement version 2.3.0d along the corridor by 2016. The deployment of ERTMS has already begun in Spain with the new Barcelona–Figueras line. Work on pilot lines in Italy and Slovenia and the equipment of vehicles by railway undertakings will start in 2009.
- **improve the quality of service through better coordination of investments between the countries, harmonisation of operational rules and an enhanced train path offer, in particular at borders** – the EEIG is working in close cooperation with existing bi-national committees (France/Italy, Slovenia/Hungary) and with RailNetEurope (RNE).

For more information, please go to: www.corridord.eu



ERTMS diary

- 6-7 October 2009: Brussels
  Committee on the Interoperability and Safety of the European Railway System
- 19 October 2009: Brussels
  ERTMS MoU Steering Committee
- 16 November 2009: Brussels
  ERTMS Corridor Group

Please send us your dates!

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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