

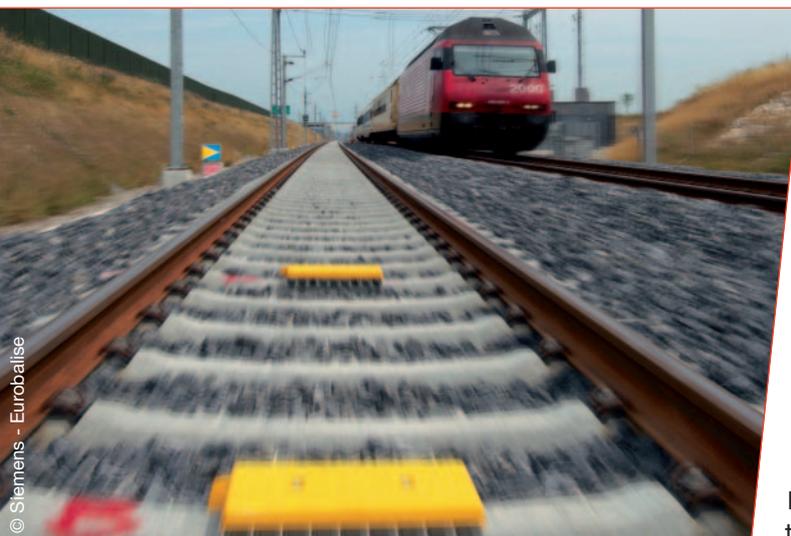
Signal

the European Rail Traffic Management System

Issue number 12,
May 2009

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© Siemens - Eurobalise

2009 has been a productive year so far. In this issue, *Signal* welcomes guest author Bernhard Stamm, Senior Expert with Siemens Switzerland, to provide his expert view on the data transmission system – Eurobalise. In addition, not one but two Chairmen of the UNIFE ETCS Steering Committee discuss ERTMS and Corridor C is given the once-over.

The Signal team

Eurobalises

By Bernhard Stamm (Senior ERTMS Expert with Siemens Switzerland, a member of various UNISIG working groups and industry representative at the European Railway Agency Working Groups on ETCS System Version Management and ETCS Braking Aspects).

The most critical element of any train control system is the transmission medium used to send data from the track to the train and vice versa. In most of the existing train control systems, the data transmission channel is the limiting factor with regard to functionality, performance and safety.

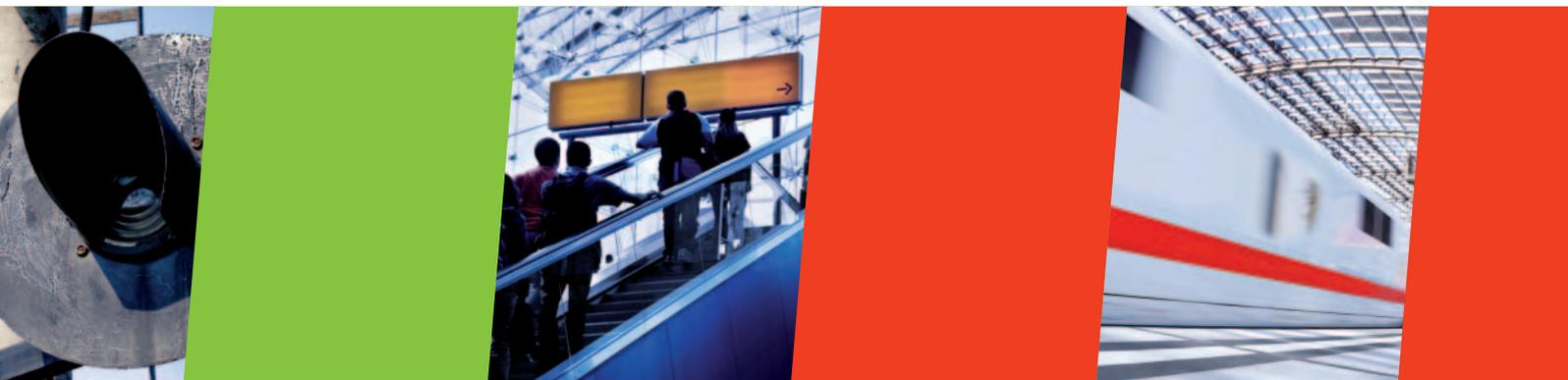
To avoid such limitations, three different data transmission systems have been defined for ERTMS/ETCS, the use of which depends on the requirements of specific applications. These systems are:

- **Eurobalise** for spot data transmission
- **Euroloop** for semi-continuous data transmission
- **GSM-R** (Global System for Mobile Communications – Railway) for semi-continuous and continuous data transmission as well as for voice communication.

Out of these three, however, the Eurobalise is the only one utilised in every ERTMS/ETCS project regardless of the application level.

ERTMS/ETCS involves a number of very demanding performance requirements including high data rates and volumes, speeds of up to 500 km/h, high immunity against environmental influences and very high safety targets. Because of these requirements, however, none of the existing spot transmission systems available on the market was suitable, meaning that a new technology had to be developed specifically for ERTMS/ETCS.

This technology is based on a magnetic coupling between an onboard Eurobalise-reading antenna and the Eurobalise in the track. The onboard antenna generates a strong magnetic field of a high frequency, which is used to power and interrogate the Eurobalise. The latter then responds by cyclically sending back a telegram until the onboard antenna leaves the contact zone. The data sent by the Eurobalise can either be



pre-programmed into the balise or generated by the lineside signalling system.

Any Eurobalise can be read by any onboard device regardless of the supplier. To ensure that the Eurobalise is interoperable under all circumstances, hundreds of technical parameters had to be specified and tested.

Many suppliers have developed compatible Eurobalise products. Any of these balises can be read by any balise reader, without the latter detecting any difference. This interoperability is, however, limited to the air gap. In many other aspects the products differ quite extensively, since certain functions not relevant for interoperability such as mechanical mountings and programming are not standardised.

Today the Eurobalise has become ‘the’ standard element for spot data transmission in railway applications. These applications not only include ERTMS/ETCS but also many applications where existing train control systems (such as the Italian SCMT or the Swiss EuroZUB) are being prepared for later transition to ERTMS/ETCS (through additional programming of the Eurobalises). Eurobalises are also being utilised in more and more countries worldwide. Even train control systems for narrow gauge trains – as well as trams – are starting to use Eurobalises due to their performance and price advantages and their availability on the market.

Interview with Friedrich Hagemeyer and Michel Van Liefferinge



Friedrich Hagemeyer, born 1947, studied physics. He occupied different development and managerial functions in the Siemens Communications Division (1979-92). Until 2006 he was General Manager of control systems, mass transit and the signalling business with Deutsche Bahn. He is currently coordinating the ERTMS strategy at Siemens Mobility.



Michel Van Liefferinge, born 1959, has a background in telecommunication engineering. For 20 years, he has built a solid experience in the signalling division of Alstom, where he has occupied several managerial positions. He is currently Managing Director of Alstom Belgium Charleroi, the Alstom development centre of ERTMS solutions and projects.

At the beginning of June, Friedrich Hagemeyer will hand over the Chairmanship of the UNIFE ETCS Steering Committee to Michel Van Liefferinge. Signal interviews them both.

Signal: What key challenges stood in the way of ERTMS when you took over as Chair?

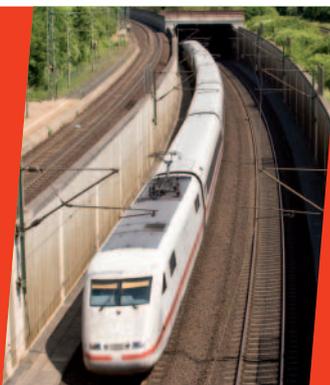
FH: Three years ago, the ERTMS environment was different from the one we have today. Back then, I remember that there were even questions such as ‘Will it really work?’ or ‘Is it really necessary?’

The first practical challenges, for instance the putting into commercial service of the first lines, had to be met. From a technical point of view, the ERTMS standards were not yet stabilised: all actors, including the supply industry, were still in a learning phase. One should not forget that by opening the supply market and opening opportunities for a fully interoperable

European railway network, ERTMS pushed both suppliers and railway undertakings to completely review their business strategies – and also to learn working together.

Signal: What have been the major achievements since then?

FH: The entering into commercial service of major ERTMS-equipped lines was a key milestone for the industry. The stakeholders realised that ERTMS was indeed bringing significant benefits, and ultimately enabling modal shift. Furthermore, ERTMS demonstrated that it was suited to both high-density traffic (Switzerland) and High Speed (Italy, Spain). It even emerged as a solution for the overlooked interoperability problems between mass transit and regional systems in big cities!



Under the leadership of the EU, this translated into a strong political commitment from all stakeholders, as illustrated by the ERTMS Memorandum of Understanding. We increasingly see that the debate is not any more on whether ERTMS should be implemented; the question is rather now how best to implement it.

Signal: What can be done by the different actors to decrease costs?

FH: Many of the costs relate to the double equipment of lines. A fast migration scenario enabling railways to move quickly to ERTMS and remove the obsolete legacy systems provides significant gains to both infrastructure managers – as maintenance cost fall dramatically – and railway undertakings, since locomotives do not have to be equipped with several signalling systems. A fast and EU-coordinated migration scenario is the key to the successful deployment of ERTMS.

Signal: What next, for you?

FH: As the regular time period for sharing the UNIFE ETCS Steering Committee has passed, I am handing over the Chairmanship to Michel Van Liefferinge but I will continue to represent Siemens Mobility within this Committee.

Signal: What role can industry play to ensure that commitments in the Memorandum of Understanding signed by key actors in the railway sector last July 2008 are met on time?

MVL: The ERTMS Memorandum of Understanding contains clear objectives and deadlines, to which the suppliers are fully committed. As regards the development of Baseline 3, our experts gathered in the UNISIG consortium will follow strictly the timetable laid down in the MoU, in cooperation with the European Railway Agency.

I believe that the recent debates within the ERTMS Steering Committee have also shown that there is a significant added value in discussing issues such as the harmonisation of operational rules or testing, which are also part of the Memorandum of Understanding. We will continue to invest time and resources in these debates.

Signal: What challenges lie ahead for ERTMS?

MVL: The opening of cross-border lines will be an exciting challenge. On this topic, the stakeholders realise that issues not directly related to ERTMS – for example the diverging operational rules between countries, or cross-acceptance – also come into play and should be investigated.

Another critical issue will be to coordinate ERTMS investments, and we very much welcome the initiatives taken by the European Commission in this regard. A true European coordination is vital to ensure that there are no ‘gaps’ along the rail corridors equipped with ERTMS.

Signal: ERTMS is also an opportunity on the world market – how do you see that developing?

MVL: Indeed, nearly 50 % of the total ERTMS investments are made outside the EU. Countries such as China, India, Saudi Arabia, Turkey, Mexico, Algeria, Taiwan or South Korea have launched major investment programmes. For many UNIFE members and for the EU, ERTMS has become a strategic product for export. It also consolidates the European leadership in terms of railway systems.

Finally it demonstrates that ERTMS is simply the best signalling standard in terms of traffic capacity, speed, safety and multi-supplier opportunities.

Signal: What are your priorities as Chair for the next 12 months?

MVL: A key priority will be to continue our ongoing activities to define a clear process for ERTMS testing and homologation. As shown in the debates we had with the European Commission and the stakeholders, there is a clear ‘European added value’ on this challenging topic.

Another key issue will be the work to be done on the migration strategy from 2.2.x to 2.3.0d in order to align smoothly the current ‘ERTMS islands’ and move the cross-border operation.

Following the same idea, I aim to continue the excellent work done in the past years – UNIFE must remain at the forefront of the ERTMS debates and as Chair I will strive to ensure that this remains the case.

Focus on Corridor C



The European Economic Interest Grouping (EEIG) Corridor C was created on 16 March 2007 by the infrastructure managers (IM) RFF, CFL and Infrabel with one specific goal – to promote interoperability along the Antwerp-Basel/Lyon axis and, thanks to the implementation of a substantial component of the axis by 2013, it is a project to which the Swiss IM SBB Infra joined thereafter.

Its permanent ERTMS and 'Quality and Interoperability' working groups are gradually producing concrete agreements between IMs and railway undertakings (RUs) in the field of national values (variables that are used to set parameters for the onboard computer on one line), categories of trains, the harmonisation of operational rules, braking curves and data entry. Since work began, the participants have unanimously opted for the implementation of ETCS version 2.3.0.d.

In line with the desire to develop European rail traffic, several actions have been taken to improve the quality and reliability of traffic: the implementation of the train monitoring tool Eurotiral, altering the rules on changing train numbering in France and developing a facilitator role to help RUs.

In all its work, the EEIG has given priority to rapidly obtaining results in technical, operational and regulatory areas. While strengthening its permanent staff, it maintains a lean and flexible structure based on a single management body. And as senior officials are involved, decisions on the field are made more quickly.

The tonnage transported and the number of tonne-km on Corridor C increased by some 8% in 2008 compared with the previous year.

To contact Corridor C: info@corridorC.eu



© UIC 2009. Source: UIC ERTMS database

ERTMS diary

- 8 June 2009: Brussels ERTMS Corridor Group

- 11-12 June 2009: Brussels Committee on the Interoperability and Safety of the European Railway System

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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Published by: Directorate-General for Energy and Transport
European Commission – BE-1049 Brussels

http://ec.europa.eu/dgs/energy_transport/index_en.html

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