

Co-operation is key to rapid deployment

Regulators and suppliers believe that greater standardisation and operational harmonisation will be essential to ensuring cost-effective implementation of the European Rail Traffic Management System over the coming years, avoiding a proliferation of country-specific adaptations. Chris Jackson reports from Valenciennes.

I am extremely passionate to preach the message of ERTMS', proclaimed ERA Executive Director Oana Gherginescu, opening the agency's biennial conference on April 22. Describing the concept as a 'technical religion', she said that over the past 30 years it had gathered 'a lot of believers, who were buoyed up by faith'. However, there were still many non-believers, and she felt it was essential to consider 'what we are actually doing, and what we need to do, urgently. We need to make it happen now'.

Organised by the EU Agency for Railways at the Cité des Congrès in Valenciennes, the three-day event attracted more than 650 delegates from all parts of the European rail sector, with a further 100 or more following the proceedings online.

Citing the 'promises' of safety and capacity which underpinned the train control architecture that had been developed by engineers almost 30 years ago, Gherginescu warned that 'a religion needs to be lived in real life, and not just preached'. But with ERTMS she admitted that 'we are not where we need to be'; there were 'too many issues and too many interpretations of the standards'. In particular, she felt this was penalising the early adopters, who had expressed their faith in the technology before the standards were really complete.

DG Move's Director of Land Transport Kristian Schmidt told delegates that there was 'momentum' in the European rail sector, with passenger demand up 5.8% in 2025 and a raft of new services introduced including

cross-border and night trains. Meanwhile, the European Commission was 'moving ahead' with many aspects of its rail policy. The much-debated Capacity Management Regulation would come into force at the end of June, he reported, while a Regulation on rail ticketing would also be tabled within the next month. Meanwhile, the Commission was looking at strengthening ERA and providing the agency with additional resources to cope with its evolving mandate. Overall, he believed, 'rail is going well, but ERTMS risks being the weak link'.

Citing the findings from a report into the escalating costs, issued by the Commission's ERTMS Deployment Management Team last year (p49), Schmidt suggested that governance was a major challenge. 'The fragmented bottom up approach will not work any more', he warned. According to the report, implementing ETCS on a project-by-project basis had resulted in more than 150 country-specific variants, as different infrastructure managers sought vainly to mesh the new technology with their legacy signalling systems and operational rules.

However, Schmidt felt there was no time for recrimination, with customers blaming the suppliers or the authorising authorities and the suppliers blaming numerous bespoke requirements which drove up the cost compared to standard products. 'The bashing must stop', he urged. 'We must all work together if we are to accelerate the pace of change.'

'Rail is not living in a vacuum', Schmidt continued. 'We are in competition with other modes.'

650

Delegates from all parts of the European rail sector, with a further 100 or more following online

Drawing on his wider Land Transport brief, he explained that the road sector was 'a completely different world', with thousands of small operators across the member states. Each made its own investment decisions with very few cross-border interoperability issues, while the reinvestment cycles were much shorter than those for rail, making it easier to keep up with changing technology.

Emphasising that 'the road sector is greening fast' with the increasing adoption of electric vehicles, he suggested that rail's environmental advantage would be much reduced in 15 to 20 years, even if railways still offered significant advantages in terms of capacity and energy efficiency. 'Rail's future has to be collaborative', he reiterated.

The Commission's ERTMS Co-ordinator Matthias Ruete emphasised that a Europe-wide roll-out 'should not be treated merely as a complex technical challenge, but rather considered at the highest level of all stakeholders as a strategic modernisation project. Crucially, stakeholders must recognise the ERTMS roll-out as a long-term project with a strong industrial and policy dimension.'

In his recently published third Work Plan, Ruete reported that by the end of 2024 ERTMS was in operation on 12 400 km of the TEN-T network across the 27 EU member states. Another 28 000 km was due to be operational by 2030, although he pointed out that would still be a long way short of the legal requirement to equip the entire 62 960 km core network by that date.

In terms of rolling stock, some 8 730 vehicles had been fitted with onboard equipment, representing 19% of the total fleet, with a further 13 600 vehicles to be equipped by 2030. That represented a 'significant' increase in the annual rate achieved over the past four years, but he was concerned that in many cases it would still be 'insufficient' to allow for a phasing out of the so-called Class B national train protection systems.



Photos: ERA

Learning and sharing

Over the course of the conference there were panel discussions looking at the current state of deployment in various pioneering countries and the practical experience of train operators, infrastructure managers and regulatory authorities as they sought to implement ERTMS or operate using ETCS across multiple networks and cross-border connections.

Another panel looked at certification and authorisation, seeking suggestions for ways to simplify and speed up the process to reduce the costs. Speaker after speaker emphasised the need for greater standardisation between projects, which would reduce the complexity and facilitate

Conference delegates included representatives of train operators, infrastructure managers and regulatory bodies, as well as suppliers, researchers and industry associations.

cross-acceptance of equipment and systems from one project to another. A series of workshops looked at the scope for harmonising operational rules and processes, including the use of automated text messaging to minimise voice communications between drivers and signallers.

Former Bane NOR CTO Sverre Kjenne, now heading the ERTMS Users Group, said there was 'no disagreement about the need for harmonisation and standard products — the question is how do we do it'.

Another session looked at the current state of development of FRMCS and the challenges that face the sector as it is gradually implemented as a replacement for GSM-R. With more

than 50 open points in the standards still to be addressed, the final specification is not expected to be ready until 2027, ready for inclusion in the Technical Specifications for Interoperability by the end of 2028. However, that will leave relatively little time to roll out the new radio network across Europe by the mid-2030s, even if the funding and technical resources can be found.

A long discussion on ERTMS cost drivers was followed by a session on innovation, with Europe's Rail Executive Director Giorgio Travaini heading up a panel that largely focused on the work of the System Pillar. 'What future do we want?', he asked. 'More Europe, that is more prosperous, with more sustainable transport. We need to make rail more attractive, more integrated. And that needs a collective effort — many minds working together.'

Reflecting on the 'valley of death' between research and commercial deployment, Travaini explained how Europe's Rail had been focusing on a 'pre-deployment phase', where emerging technologies could be tested in real-world operations, as is currently happening with the Digital Automatic

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Oana Gherghinescu, Executive Director, ERA





Coupler. Looking ahead, he suggested that a key focus for the next research partnership, which would hopefully follow EU-Rail under the EU's 2028-34 budget period, would be a 'system simplification mission', developed in conjunction with DG Move.

Reflecting on the trade-off between innovation and stability, Kjenne explained how Norway's signalling programme had taken 10 years of development between the initial concept and the first application, during which time the specifications had continued to evolve. His dream was a Europe-wide target architecture, as was now being pursued through the System Pillar.

Gherginescu reiterated that 'ERTMS is no longer a technical experiment, it is a reality. We need to handle it very cautiously. Do we need to update the TSIs every two years, or should we wait a bit longer to ensure stability? We must resist the urge to add in all those "nice to have" improvements.'

However, Travaini emphasised that 'stability does not mean stagnation', warning that 'the system we have now is not sustainable for the future. We need to evolve the railway system, but to do that we need you all to work with us. And we need to inspire the next generation.'

Three proposals

Looking ahead, Schmidt said DG Move had been reflecting on ways in which ERTMS deployment might help to

A series of workshops sought feedback on key aspects of ERTMS, including the harmonisation of operational rules, cost control, evolution of the specifications and the future interface with FRMCS.

make the longed-for Single European Railway Area a reality. He put forward three concepts for consideration by industry stakeholders over the coming months.

- Introduction of a 'SERA label' for ERTMS products that are fully compliant with the target system and compatible with each other. This would hopefully incentivise the adoption of standard products for future deployments rather than bespoke variants; and allow greater industrialisation by the suppliers to help drive down costs. In turn, it might force countries to decommission their incompatible Class B systems faster. Use of such products might become a requirement for EU funding support, he suggested.
- The introduction by ERA of a 'fast lane' for the approval of ERTMS trackside (and potentially onboard) systems, as the use of fully SERA-compliant equipment should simplify the certification and authorisation process. The agency would look to

work with applicants and NoBos to standardise the wording of the online applications to facilitate automated checking and potentially cross-acceptance of previously approved elements.

- A common template for ERTMS procurement, enabling infrastructure managers and train operators to specify their purchases in a standard way. This would also incentivise the procurement of equipment that meets the SERA blueprint, at a lower cost, and feed into the faster approval process.

No going back

'We are in a bit of a "stuck" situation' Gherginescu admitted. 'Do we go back or are we truly committed to make it happen? I want to praise the pioneers that have gone for it and implemented ERTMS across their networks. Some of the followers are still not convinced, but I believe we don't have the choice any more; there is no going back.'

'We all recognise that the cost and configuration issues are not trivial, but we need to tackle the complexity. As someone said earlier in the conference, "don't wait for the stars to align". We need to make a start and get on with it.'

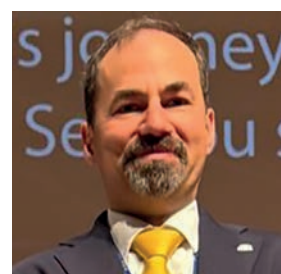
'The pressure is on all of us. We have legal pressures, in the form of the TEN-T deadlines, and financial pressures from the investment already made. We cannot afford to put that at risk. Then there are operational pressures — having no ATP is a risk, and unfortunately accidents are still happening. We need to play the safety card as well as productivity. Political pressure is coming in the form of the EU's high speed rail master plan and the growing issue of military mobility. And finally — but by no means least — there is market pressure. Europe needs to make it quick and simple to install, or the Chinese will come in and make it.

'We need to respond to these pressures, and not be scared. When we come back in two years, I hope that we will not be discussing the same challenges, but looking at the progress we have made in tackling them. The future starts now.' 



'We need to make rail more attractive, more integrated. And that needs a collective effort — many minds working together'

Giorgio Travaini, Executive Director, Europe's Rail



Suppliers reject 'limited competition' claim

UNIFE and UNISIG have pushed back against suggestions that limited supplier competition is to blame for spiralling ETCS costs, arguing instead that the real problem lies with market fragmentation. **Thomas Wintle** explains.

European rail supply association UNIFE and signalling group UNISIG have challenged the findings of a European Commission-backed study into rising ETCS costs, calling its claim of limited market competition 'unjustified'. In a paper entitled 'The cost drivers for ETCS on-board systems: the supply industry's perspective', they argue that costs are being pushed up instead by fragmented project requirements and the complexity of deployment.

The industry document is a direct response to a report by the Commission's ERTMS Deployment Management Team report, published last year, which identified limited competition as one of several cost drivers behind the sharp rise in onboard ETCS deployment costs across Europe. The DMT study painted a sobering picture of escalating costs threatening the continent's ERTMS roll-out, claiming that the average price of retrofitting rolling stock with ETCS had doubled between 2018 and 2022, from around €450 000 to €900 000 per vehicle.

Warning that the sector was 'closer to the worst-case scenario than to the target envisaged', the DMT report attributed this to a combination of fragmented national requirements, lengthy and unpredictable authorisation processes, and excessive testing. However, it also honed in on 'limited competition among on-board system suppliers' as one of the key cost drivers, listing a series of measures aimed at making ETCS tenders more competitive.

Fragmentation to blame

UNIFE and UNISIG feel that the problem is fundamentally structural, rejecting the DMT views on limited competition as 'unjustified', they point out that 'currently, there are at least seven active ETCS onboard suppliers and an even greater number of ETCS onboard products available on the market'.

The associations believe that the real challenge in the ETCS onboard sector 'lies far more in market fragmentation', noting that competition in cross-border projects is 'more limited than the mere availability of ETCS onboard products'. ERTMS projects, they argue, are rarely just a case of buying and installing an onboard signalling product; in many cases, suppliers must make ETCS work alongside older national train control systems, bringing different control interfaces together and adding new or country-specific functions.

This can mean integrating several Class B national systems, combining ETCS and legacy controls into a single Driver Machine Interface, and preparing for additional functions such as FRMCS. Retrofit projects can be even harder,

because the suppliers are often dealing with older rolling stock, incomplete vehicle information and non-standard interfaces, sometimes without full support from the original vehicle manufacturer. 'Not all manufacturers are willing to take on the risks associated with these challenges', the associations warn. 'Project complexity must therefore be reduced so as to reduce market fragmentation.'

Requirements drive costs

Another key point of divergence is the role of operators and contracting authorities. While the DMT report identifies project-specific requirements as one of several cost drivers, the associations place far greater weight on this element, suggesting that customer requirements 'have the biggest impact on the costs for an ETCS onboard system'.

The issue, in their view, is not simply that ETCS projects are technically complex, but that buyers often add demands beyond the baseline control-command and signalling technical specifications for interoperability. 'Every additional requirement that goes beyond the CCS TSI increases costs, adds complexity and diverts resources away from the implementation of genuine product improvements', they explain.

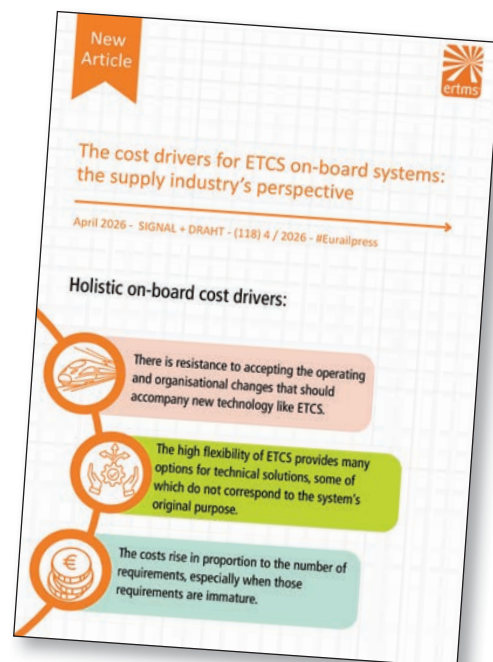
Modularity not a short-term solution

While the DMT report favours modularity as a key pathway to reducing life-cycle costs, the associations argue that ETCS systems are already 'highly modular' and that further modularisation would not automatically deliver savings. For example, they note that any change to a safety-critical SIL 4 system would still require the whole system to be re-tested and re-certified. 'These challenges will not disappear just because the components have been defined as modular subsystems', the suppliers warn.

The manufacturers also point to a hardware issue: new requirements and higher safety standards have pushed the existing processors to their limits. This means 'simple' software updates often require expensive hardware replacements just to handle the extra processing required. Redesigning for modularity could mean higher short-term costs, they argue, even if standard interfaces would help longer term.

Regulatory changes under scrutiny

UNIFE also pushes back on regulatory changes introduced under the 2023 revision to the CCS TSI, which the DMT report presents as part of the solution. One example is partial fulfilment, where the suppliers suggest that removing existing flexibility would increase costs by forcing



UNISIG has pointed to a range of factors driving the recent increase in ETCS equipment costs.

suppliers to implement functions 'that may never be used or are new and have open points'.

They also question the new error correction regime, noting that suppliers often implement proprietary fixes before formal solutions are agreed upon, meaning later mandatory changes can add further cost. 'Neither the new regulations pertaining to error corrections nor the elimination of partial fulfilment will lead to any cost reductions', the report concludes.

On certification and authorisation, the associations broadly align with the DMT view, whilst describing the process as 'unpredictable, costly and resource-intensive'. They call for simplification measures, including reduced duplication of effort, reusing previous assessments and the introduction of 'authorisation-free zones' for certain changes. The industry remains highly critical of the ETCS System Compatibility framework, which was intended to streamline deployment, but has become 'one of the biggest sources of complaint in the sector' due to inconsistent implementation and its close link to authorisation procedures.

Whilst UNIFE and UNISIG essentially support the majority of the Commission's analysis, they see the cost drivers and related solutions somewhat differently. The paper concludes by stressing that the list of points addressed 'is certainly not exhaustive', and 'it is therefore essential that the stakeholders engage in regular dialogue about cost drivers and agree on ways to eliminate them'.