European Rail Industry involvement in the Eulynx project activities

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About UNIFE

Based in Brussels since 1992, UNIFE is the association representing the European rail supply industry at the EU and international level. UNIFE gathers over 90 direct company Members – from numerous SMEs to major industrial champions from all over Europe – active in the engineering, design and manufacture of rolling stock (i.e. trains, metros, trams, freight wagons) as well as rail signalling and infrastructure equipment. UNIFE also brings together national rail industry associations from 14 European States.

Introduction: scope and evolution of the Eulynx Project

Eulynx is a European initiative, launched in 2014, bringing together 12 European Infrastructure Managers (IMs) in a consortium with the aim to standardize interfaces and elements of the signaling systems in order to reduce cost and installation time of signaling equipment. At the basis of this project there is the willingness to find a common solution to the following challenges the railway business is currently facing:

- Cost of rail infrastructure;
- Train delays due to old and diverse signaling technologies;
- Route availability threatened by shortage of crucial signaling components and knowledge;
- Market changes driven by competing transport modes and customers requiring more information, services and operational excellence.

Eulynx consortium takes inspiration from the project that has defined the European Rail Traffic Management System (ERTMS) as the unique standard European System (Class A) for Automatic Train Protection (ATP) replacing 24 different national (Class B) ATP systems. In the same way as ERTMS, the 12 IMs of the Eulynx consortium aim to replace the current patchwork of national interlocking systems by defining and implementing the interlocking system standardization interfaces in the framework of the future digital control command system (CCS) architecture.

One of the main goals of the interlocking system standardization would be a significant reduction of the lifecycle cost (LCC) of computer-based interlockings with respect to relay-based interlockings. In this way, some parts of an interlocking could be replaced without the need for a complete renewal of the interlocking, also reducing the demand for planning and approval resources which comes with a complete replacement.

Prior to the Eulynx projects, several European initiatives relating to the interlocking system standardization have been carried out in the past (i.e. Euro Interlocking, INESS). However, none of them proved to be successful due to a lack of a clear business case. For this reason, Eulynx members decided to apply a different approach mainly focusing on the reduction of life cycle costs due to the interchangeability of components (allowing the opening of the market).

Currently and in the context of the digitalization of the Railway System, the Railway Sector is facing several existing - and sometimes overlapping –initiatives, Eulynx being one of them:

European initiatives:

- ERTMS Users Group (EUG) and Eulynx White Paper Reference CCS Architecture based on ERTMS (July 2018)
- S2R – Innovation programme 2 (IP2) on Advanced Traffic Management and Control Systems (2016)
- Eulynx (2014)
- ERA/Arcadis CCS Migration Study (2018 – ongoing)

National initiatives:

- DB Netze NeuPro project (2014)
- SNCF PAI-NG 3, new generation of computerized interlocking control unit
- Swiss Railways Smartrail 4.0 project - ETCS interlocking (2018)
- Bane NOR project in Norway (2018) including (ETCS) Level 2 type, implementing Eulynx specifications

This fragmented approach will not allow to meet the objectives of reducing the lifecycle cost (LCC) as actually required by the overall business case of the Railway System. For this reason, UNIFE calls for more coordination at the European level in the interlocking system standardization process, including the Eulynx project's objectives.

Rail Industry views on the current status of Eulynx Project

During the last Eulynx Consortium meeting, held in February 2018, the Consortium members recalled a set of interface specifications (baseline 2) was recently released. As the Rail Industry is one of the potential users of these specifications and will be required by some customers to build products and systems based on them, a feedback from the industry on their experience and concerns is requested.

Currently the role of the Eulynx consortium in the context of proposing interlocking standards is mainly focused on the interfaces between objects controllers (OC) and the ILS (electronic interlocking)[1] with the purpose of exchangeability in the context of existing architectures.

However, there is a lack of top-down approach, considering the Rail Industry, the European Railways Agency (ERA) and the other European bodies (DG Move, S2R) have not been involved in the process of the Eulynx Project so far. Therefore, there is a concrete need to bring the Eulynx Project to a European level in order to avoid any possible overlapping and/or inconsistency

[1] Interfaces between ILS-RBC, ILS-TSS, ILS-LEU, ILS-TCS, ILS-ILS, are taken into account as well.

between the different existing initiatives and give leverage to the developments and implementation of the interlocking system specifications in a harmonized way at European level.

With this regard, UNIFE welcomes the recent initiative of the ERTMS Users Group (EUG) to publish the White Paper Reference CCS Architecture based on ERTMS. This document paves the way to a larger participation to the Eulynx project, notably to all the IMs members of the EUG.

The Rail Industry involvement should also be considered as being instrumental for the success of the project. Industry should coordinate the mind setting in a structured and formal way, contributing actively to the definition of the specifications, not only as a reviewer of them. UNIFE supports the Eulynx Consortium proposal to build this concrete cooperation around the CCB (Change Control Board) where industry representatives might be sitting to present industry's views and elaborate standards not only for the specifications, but also for approval and homologation processes for products and applications.

This involvement could be a good opportunity for the Rail Industry to rightsize the existing interfaces, use the existing solutions as springboard, co-shape the interfaces together with customers, avoid any additional R&D Costs, enable an efficient technical interchangeability and achieve a high level of generic specifications.

Main Rail Industry concerns about Eulynx Project

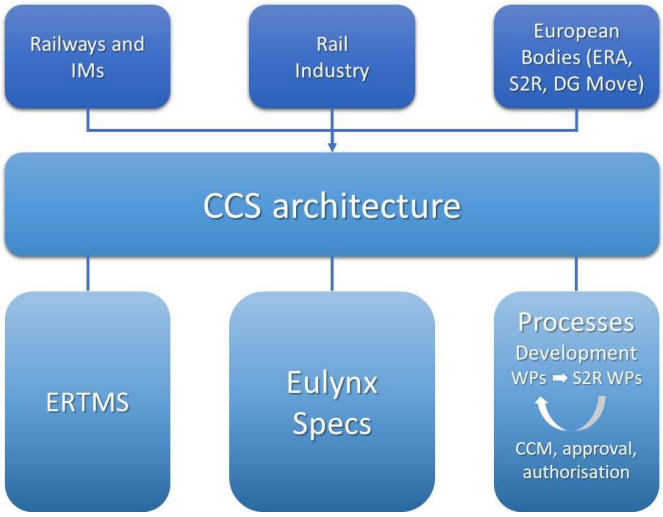
To achieve the positive effects of a wider cooperation in the Eulynx Project, the following topics have been identified and need to be addressed:

- **Top down approach and Business Case:** IMs and Rail Industries shall agree on top down approach, driven by Business Case able to demonstrate that the proposed technical choices bring clear advantages for the European Railways and Rail Industries (e.g. in terms of LCC reduction, improvement of safety and security, protection and improvement of the European market, flexibility in accepting new technologies and systems);
- **Operational principles & requirements:** IM's shall agree upfront on common basic operational principles & requirements. Such an agreement will the basis for subsequent standardisation activities and avoid the situation that interface standards become a collection of national options;
- **CCS architecture:** the Eulynx project aims at standardising some interfaces of the interlocking system, but lacks a top-down system approach in the context of a digital railway system based on ERTMS, reaching state of the art safety, security and system performances;
- **Specifications approval process:** Approval and validity process of the Eulynx specifications should be defined based on a standardized European approach for approval and homologation process;
- **Standards need to be future proof:** Eulynx project activities should be ready to face future developments and challenges (i.e. IoT, wireless, low power);

- **Role of S2R IP2:** the Eulynx activities have to be managed in a way to ensure coordination with S2R IP2 and avoid unnecessary double effort;
- **A binding commitment by IMs and industry:** to bring Eulynx project one step further, a concrete commitment by all IMs and Rail Industry to use and implement the specs in the future is needed;
- **The attractiveness by customers:** a precise business case showing the real interest of the customers in migrating towards a unique interlocking standard is needed considering both the significant effort required to the customers and the different willingness to migrate between the Member States;
- **A clear migration strategy:** National requirements should be progressively replaced by the European specs based on a structured and common migration strategy;
- **Definition of resources and funding:** an initial definition of the workload in terms of resources and expertise needs to be considered based on a clear allocation of the key tasks and responsibilities between the Rail Industry, IMs and other Rail actors;
- **Avoid any customization requests:** any specific client and/or national request to customize the products should be avoided as this contradicts with the standardization process objectives;
- **IPR issues:** the specifications IPRs are currently restricted to the Eulynx consortium members. The IPRs shall be managed to allow a level playing field, as reached by the ERTMS specifications.

Industry proposal in a wider context

The picture below shows the Industry proposal on how the Eulynx project can be conceived a in a wider context within the rail traffic management system.



The top layer represents a high-level framework where the Rail stakeholders (Industry, Railways and Infrastructure Managers) together with the European bodies (ERA, S2R and DG Move) should be contributing with their inputs to the definition of the future CCS architecture based on clear distribution of the tasks and responsibilities.

The future CCS architecture should be based on ERTMS (ETCS and radio communications) and its future game changers, leading to revisiting the basic building blocks of the infrastructure and the related processes necessary to develop the specifications, ensure the change control management, the approval and authorization.

Conclusions and next steps

Overall, UNIFE members are considering that Eulynx project aiming at the interlocking interfaces standardization may be one building block of a wider approach for a modern Railway infrastructure. However, Eulynx will come with a high price for product development if standardisation is not carefully managed. In addition, in order to make Eulynx a successful project, a “critical market mass” has to be reached.

The most important chance UNIFE detects is gaining the critical market mass by spreading interface standards to the European and worldwide markets. While the most complex risk might be “branching” interface standards into a different set for each National Market.

For this reason, the implementation of the interface specifications at European level, to be considered as real standards, should take place following a harmonised common European process aiming to avoid any customization requests from the clients, based on different national needs.

The Rail industry is willing to support the definition of the common architecture of the next generation of CCS system based on ERTMS, taking into account the Eulynx project deliveries. To this purpose, the concerns, as raised above, shall be addressed and a Memorandum of Understanding should be signed between the Rail Industry and the other stakeholders at sector level to clearly define the level of involvement and responsibility of each contributor.

For further questions, please contact:

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