DECISION OF THE SYSTEM PILLAR STEERING GROUP

Approving the Train CS Architecture as a direction for future specification work

N° 8/2025

THE SYSTEM PILLAR STEERING GROUP OF THE EUROPE'S RAIL JOINT UNDERTAKING, NOTES

- The Train CS Architecture Baseline 2 document (see Annex A) gives an integrated and high-level overview of the proposed Train CS Architecture and also describes and evaluates the evolution of the Train CS functionalities and their contribution to the benefits of the end users.

- The proposed approach has been developed based on current ERTMS specifications and technology. It provides a number of improvements which can be brought to a high maturity level in time for the TSI 2028 recommendation (REC-28).

- The document followed the principle "evolution instead of revolution" by consolidating existing knowledge and identifying a path on how to build further on it, taking into account protection of existing assets (current SUBSETS and installed base of equipment), and backward/forward compatibility.

- The rationale for this is to have a first sector-acknowledged set of architecture views of the evolution of the Train Control System that can be used as basis for the System Pillar activities related to pre-assessment and Change Requests towards ERTMS. This document can also be used by external readers of the System Pillar, to get the current state of art for CCS-OB evolution and integration.

- Such an approach is a necessary condition in developing future cost-effective systems. Numerous differing systems without the overall integration frame will be very difficult to deliver in a cost-effective way by the European supply industry.

- Inputs to the work have been received and integrated from many sources including other System Pillar domain, SP Cybersecurity, and Innovation Pillar projects and all these inputs are referenced in the Train CS Architecture Baseline 2.

- The Train CS Architecture Baseline 2 document was extensively reviewed and approved by the domain experts. Review comments were received from System Pillar Traffic CS domain, Transversal, Cybersecurity, and from Innovation Pillar FP2-R2DATO. Moreover, the user's and supplier's mirror group, CER, AERLL, UNISIG provided extensive comments that were answered by the team and solved, either by implementation of the requested change, or the clarification of the comment. The Train CS Baseline 2 in version 0.8 implemented these changes. The version 0.8 has been reviewed by the Core

Group convenors, and requested changes were implemented in version 0.9 that received Core Group convenors approval

- The Train CS System architecture proposes the migration targets for the overall CCS, with the introduction of new features that must be confirmed by in-depth studies.

- Concerning the CCS-OB, the novelties identified and subject to studies are the following:

    - Target 1 is the architecture as proposed for the next TSI to be published
        - Evaluation of modularity extensions: CCS consist network, Multi-Display System, Enhancements of the train interface, interface between ETCS-OB and Advanced Safe Train Positioning.
        - Support of FRMCS medium of communication for the airgap.
    - Target 2 is the architecture as proposed for the second next TSI to be published
        - Introduction of the Advanced Safe Train Positioning in the CCS-OB, with associated internal interfaces towards other CCS-OB subsystems, and the airgap in order for the ASTP to get required data from the trackside CCS.
    - Target A is the architecture as proposed for the long-term vision of Onboard CCS
        - Upgrade of the overall CCS system (both on-board and trackside) to support unattended train operation on the Mainline with ERTMS/ATO up to GoA4.

- The document primarily focuses on the CCS-OB architecture for Target 1, and provides an outlook towards Targets 2 and A, to secure readiness for future specification activities of the System Pillar towards ATO up to GoA4. The document integrates the results coming from the other Train CS tasks as defined by the specific contract for the phase 2.4.

- This architecture is descriptive and further decisions to be made will be at specifications level for individual subsystems and interfaces and, where appropriate, based on cost benefit analysis.

- The specification output is expected for the TSI 2028 recommendation in the following areas:
    - CCS On-Board Consist Network (new SUBSET-147)
    - Train Interface enhancements (including TI/TL adaptations)
    - Odometry enhancements (former basic ASTP)

THE SYSTEM PILLAR STEERING GROUP OF THE EUROPE'S RAIL JOINT UNDERTAKING, AGREES:

- That the Target 1 architecture, as described in chapter 3 of the Train CS Architecture Baseline 2 document, is a correct base for future work in the sector.

- That the outlook for Target 2 and A is acknowledged and that these future developments will be put forward to the SP-STG for decision.

ANNEX A: Train CS Baseline 2 document