


Pre-assessment bundles and Change Requests

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1 Introduction

The Standardisation and TSI Input Plan defines specific topics that EU-Rail intends to propose for harmonisation through the TSI channel. For planning purposes, ERA has requested that the System Pillar (SP) registers in the ERA CCM database the specific enhancement Change Requests (CRs) that will cover these harmonisation proposals for the TSI 2026 recommendation (REC-26) and TSI 2028 recommendation (REC-28). An ERA TSI recommendation is the basis for RISC voting and subsequent update of the TSI, normally some months later.

In line with the EU-Rail harmonisation process agreed within the SP-STG, there are two stages at which the SP-STG will be consulted. The first occurs before the specific CR is submitted to the ERA CCM database, and the second takes place when the mature solution proposal must be agreed by the sector prior to submission to ERA.

Most of the CRs included in this document are intended for the REC-28 and are therefore in a preliminary phase, where the problem descriptions are defined and initial approaches to potential solutions are under discussion.

Consequently, the request to the SP-STG in December will be to approve the submission of the problem descriptions and preliminary solution approaches. All CRs presented are included in the STIP v02 as decided by the SP STG. The preliminary solution proposal should show the approach of the later solution. Once for the CRs mature solution proposals have been developed - including migration strategies and economic considerations - they will be presented again to the SP-STG for discussion and endorsement.

2 Process and timing

Pre-assessment bundles serve as the primary communication channel between the European Union Agency for Railways (ERA) and the System Pillar (SP). Within each bundle, the level of maturity varies, as some topics are more developed than others.

Individual Change Requests (CRs) are prepared by the SP domains and/or the innovation Pillar (IP), based on the outcomes of EU-Rail's activities. Once finalized, each CR is submitted to the ERA CCM process.

Each CR undergoes review and approval through the SP governance process, which includes contributions and feedback from the mirror groups.

The technical refinement of the CR solution proposals is carried out within the domain and mirror groups, with opportunities for sector participation.

The SP-STG will be consulted at two stages of the process:

- Initially, before the submission of problem descriptions, and
- Subsequently, prior to submitting the mature solution proposals.

The main objective of registering these CRs in the ERA CCM database is to formalize and structure the detailed planning for the forthcoming TSI recommendations.

The key milestones are as follows:

- December 2025: Submission of CRs for the REC-26 and REC-28 recommendations to the ERA CCM database
- Q1 2026: Request to SP-STG for endorsement of solution proposals for the REC-26 recommendation
- End 2026: ERA issues its recommendation to the European Commission for the updated TSI, following completion of the internal ERA process
- Q3 2027: Request to SP-STG for endorsement of solution proposals for the REC-28 recommendation
- End 2028: ERA issues its recommendation to the European Commission for the updated TSI, following completion of the internal ERA process.

Note: If mature solution proposals or complete topic bundles become available before Q3 2027, they will be presented to the SP-STG ahead of schedule.

For some of the enhancements also related error CRs are needed as enablers for the enhancement solutions. In some cases the System Pillar analysis of possible enhancements has revealed errors in the ERTMS specifications. This should be addressed by submitting related error CRs, in addition.

3 Problem descriptions and analysis

3.1 Cybersecurity

Current TSI specification have limited requirements for cybersecurity and may not fully comply to EU cybersecurity acts and directives.

Most current TSI specification related to communication interfaces will likely need an update to comply to EU cybersecurity acts and directives for their respective scope (technical interoperability).

Subsystem	Impact ed (Y/N)	Comments
Control-command and signaling	Y	Closing gaps in Subset-146 and Subset-147 Reduce overspecification in Subset-146
Rolling stock	Y	Onboard Energy metering systems (EMS) gap analysis not fully completed
Infrastructure	N	No impact
Energy	Y	Onboard Energy metering systems (EMS) and data collection systems (DCS) subject to TSI ENE
Operation and Traffic Management Subsystem	Y	For parts of TSI CCS
Maintenance	N	No impact
Telematics applications for passenger and freight services	Y	Closing gaps in TD-104 and TD-B60, define automation for PKI certificate management (from email communication and manual certificate update process to automatic certificate renewal as in TSI CCS)

transition regime and impact are currently under analysis by the domain and mirror groups

3.2 Odometry enhancements (former basic ASTP)

There are currently 3 CR associated to this bundle:

- SP-CR-07692-ASTP/Odometry robustness enhancement
- SP-CR-07695-ASTP/Odometry - Performance Target enhancement
- SP-CR-11989-Localisation interface

Robustness

The conditions to fulfil the current ETCS accuracy targets for distance and speed measured onboard (SS041 5.3.1.1 and 5.3.1.2) can be ambiguous leading to a large variety of behaviours concerning odometry, depending on the implementation of each supplier.

This CR aims to clarify the conditions when the odometry function can be considered in the malfunctioning state and explicitly define an availability target with the goal to make the odometry function more “robust”.

This CR intends not to trigger new development but rather to specify what is already achieved and under which conditions, by most of the current odometry system in operation.

Performance

One of the aims of the change is to achieve better performance than currently specified in the TSI for the odometry under defined conditions.

The increased performance of the odometry is applicable primarily to “Basic advanced safe train positioning” based on what is currently achievable.

Odometry enhancement interface

The Odometry-interface for testing and external users needs to be specified and included as CR for the CCS TSI.

3.3 CCS onboard modularity

For REC 2026/REC2028 extensions in relation to the CCS Ethernet Consist Network (ECN) are foreseen. The CCS ECN is a basis for CCS on-board modularity. It supports on-board CCS upgradeability of separate sub-systems and a simplification of system integration to be able to ease the integration of new subsystems from different vendors, facilitated by full standardization of most of the interfaces between subsystems within the on-board CCS subsystem and between the on-board CCS subsystem and its external environment (e.g. the Rolling Stock subsystem). So, the CCS ECN is a basis for the System Pillar Train CS architecture and its further evolution steps.

The CCS Ethernet Consist Network (ECN) has been introduced already with CCS TSI 2023 with Subset-147 and several application layer FFFIS. With the current SUBSET-147 v1.0.0 for some of the interfaces an unambiguous standard solution on the lower layers 1 & 2 (physical and data link layer) is established. For some interfaces and for the communication layers 3-6 as well as for the safety layer there are several options allowed so that there is no unambiguous standard solution defined yet (in case of newly designed vehicle types you can select one option for the middle layers: TRDP, OPC-UA, Profinet or S-143). Existing options and proprietary interfaces lead to a complex lifecycle management with high costs and risks. Furthermore, the existing options and proprietary interfaces do not allow to easily add new functions impeding innovation.

The next step is a full standardisation of the layers (OSI layer 3 to 6) of the interfaces between subsystems, which can be exchangeable subsystems or interoperability constituents.

The submission of the CRs for SS-147 for the complementation of the layers (for process, message, event and bulk data) is planned as it is needed for REC-26 (cyber-security) even if the other items in the pre-assessment are not ready to be finalised.

The submission of the CRs for improvement of Application Layer FFFIS (S-119, S-130 etc.) for using XML data for packet definitions is also planned before end 2025 according to IEC 61375-2-3, Annex C. If XML data are used the packet definitions can be directly used in projects without project specific transformation of the packet definitions in the Application Layer FFFIS to the XML format.

A CR for the introduction of Safe Time Layer is needed for time-critical safety applications which establishes a relative but safe time synchronisation for safe time stamping. The submission is planned for 2027. A proper cannot be achieved for REC-26 solution needs but needs to be

aligned with IEC 61375 workstream. For the current CCS on-board architecture and for target 1 of Train CS architecture this CR is not needed. The CR will be only needed for new sub-systems with very high demands on time critical communication. The solution would result in an additional communication layer for which the efforts for upgrading are marginal in comparison to the introduction of new sub-systems in the CCS on-board architecture, Therefore, a a separate later introduction with REC-28 is unproblematic.

In addition some changes will be needed for consistency of SUBSET-147 specification with FRMCS v3 workstream.

3.4 Train Interface enhancements

In The Train CS domain an analysis took place of missing gaps to have a stable and full set of ETCS-Rolling Stock and ATO-Rolling Stock functionalities defined for the next years in order to allow a TCMS of supplier 1 being interfaced with ETCS/ATO of supplier 2 without any additional modifications required on the TCMS-product in order to be properly interfaced with the ETCS/ATO. For this purpose The SP Train CS has followed the following analysis process:

- We had a questionnaire asking suppliers and operators for additional TI functions which are missing in S-034/-119/-139.
- Further input analysed: OCORA analysis of OCORA Releases 5 and 6.
- Further input analysed: DAC input for train length elaborated in Task 4 of the System Pillar.
- All inputs have been analysed if something is missing. So far not additional TI functions are known.
- The Train CS architecture analysis has been checked for possible impacts.
- In addition, in future additional requirements can come from the operational design activities of the System Pillar.

Train CS has analysed the current limitations and future needs of the functional description of the ERTMS - Train Interface.

These individual enhancements will support the CCS on-board evolutions as included in STIP and contribute to protection of investments and CCS onboard upgradeability. They consider not only the final target but the coherent stepwise approach with consideration of target system and current ERTMS implementations.

If no action is taken,

- project specific integration costs and efforts are not reduced as possible,
- the functional description of the CCS on-board-train interface
 - will not consider the enhancements brought to the system by DAC,
 - will not benefit from the harmonisation of operational procedures and
 - will not follow the roadmap of the onboard architecture for a more modular onboard systems.

Within the European fleet, these shortcomings will increase if this enhancement is not considered for the interface of the new developed vehicles. Several CRs of this pre-assessment bundle shall be introduced together with results from operational harmonisation and with approved related step of the on-board roadmap (recommendation REC-28). The solutions of specific topics proposed will be reviewed when the results of operational harmonisation or onboard modularity roadmap have been finalised

Different data in the system:

The following are different examples of the specific objectives related to system data:

1. **SP-CR-07696: Exchange of Driver entries on the Train Interface:** A bi-directional exchange between the ETCS on-board and the TCMS is requested for the language information and the train running number. The driver entry should be only one time.
2. **SP-CR-07698: Information on Changed Train Data on the Train Interface:** It is an option for specific train data items used by the ETCS on-board to be changeable by input from the train interface (TCMS), as well as by the driver. In case the driver overwrites a value of the train data stored by the ETCS on-board that was obtained from the TCMS via the train interface this will lead to the data inconsistency at the train level. The only way for the TCMS to know what train data are used by the ETCS on-board, is that the on-board mirrors the data to the TCMS after change.
3. **SP-CR-07700: NID Country on the Train Interface:** Exchanging the NID country of the Last Relevant Balise Group encountered by the train from the CCS on-board to the Rolling Stock informs the train of the country or region in which it is running and enables it to automatically adapt its operational behavior according to national rules.

SP-CR-07697: ETCS mode provided to TCMS:

Currently only some of the ETCS modes are sent through the train interface. It should be avoided

to have specific solutions for each function but to have a generic solution. Provision of the ETCS mode prevents from further introduction of signals just reflecting a single ETCS mode like AD. In addition, the [EN 14033-1] is being reworked. During this activity the need has been recognised that a synchronisation between the operational ETCS mode and the vehicle operation mode, being controlled by TCMS, is required. Based on current specifications (TSI CCS 2023), this synchronisation is quite demanding and difficult to achieve. A neat solution would be by generally providing the operational ETCS mode from the ETCS to the TCMS.

SP-CR-07691: Addition of ETCS packet #44 on the train interface:

The ETCS packet #44 is used for “applications outside the ERTMS/ETCS system”. This means that ETCS on-board receives data which might need to be sent to the outside. One of the most common external consumers is the train.

The purpose of this interface enhancement is to harmonise this exchange from ETCS on-board to TCMS. This allows for additional functions making use of ETCS packet #44 without the need of implementing project specific ETCS on-board solutions. With this proposal it is avoided to extend the Train Interface in a proprietary way. The target of SERA should be to remove packet #044 functionality from ETCS. As long as the packet is not removed it is useful to have it on the train interface for the migration period.

SP-CR-17381/CR-33502: Missing Train Interface Functions in TSI LOC & PAS:

The functionality for the ETCS and ATO related Train Interface functions of Subset-034 and Substem-139 need to be described in the TSI Loc&Pas. Currently this is only the case for a part of these functions. When we write the solution proposal we will provide the description of missing functions. If the problem is not addressed newly designed vehicle types might be not prepared for integration of ETCS on-board as several Train interface functions which are mandatory for ETCS are not addressed in the TSI Loc&Pas.

SP-CR-18783: ETCS Odometry Data on the Train Interface:

There is a need to provide odometry information from the ETCS on-board on the train interface e.g. to improve the capability of the "set speed" function or to potentially reduce and rationalise the number of odometry sensors and odometry systems.

There are situations in which there are differences in odometry information between what TCMS has evaluated and ETCS uses which potentially can cause unexpected interventions. The TCMS needs the data of ETCS speed and distance supervision so that an ETCS intervention is prevented.

SP-CR-28259: Standardised Train Length Input with higher SIL:

According to the concepts and expectations from SP Task 4/FP5/FP2 an option for Train Length input with high SIL is introduced which allows to have the train length input without the need for additional project specific mitigations.

3.5 Operational harmonisation

Specific objective is to cover EC request CS-12 Further harmonisation of operational rules for radio based ETCS-alone operation

For this topic there are different CR proposed:

- **SP-CR-32559-CR for ETCS Rulebook**, is an overarching CR that aims to introduce a new ETCS rulebook that harmonises the operations both for drivers and signallers of lines equipped with the ERTMS level 2 without systems following the SP traffic CS target system.
- The rest of the CR proposed identify the enhancements for the CCS TSI Subset-026 that are aimed to facilitate the operational harmonisation:
 - SP-CR-10342-Driver ID (OD), to minimise driver interaction during start of mission
 - SP-CR-10374-SH to SM transition, to provide a transition from SH to SM mode while running
 - SP-CR-10403-Track conditions in RV mode, to make the already existing track condition functionality in ETCS also available in RV mode
 - SP-CR-10432-SR initiated by trackside, to provide the transition to SR by technical means
 - SP-CR-10461-LX-functionality, to provide better information to the driver during LX procedure
 - SP-CR-17693-SH-SM button merge, to make the start of shunting operationally more efficient and for the driver ergonomically more consistent
 - SP-CR-34635 SoM messages, to define the new system messages and related on-board functionality to enable the harmonised operational SoM procedure

The new ETCS rulebook is expected only for lines which implement ERTMS level 2 without

signals SP architecture. Economic impact on the benefits for harmonisation is being performed.

3.6 ATO GoA 1/2

The objective of this change request is to support the harmonisation and standardisation of driving rules and ATO-specific data interfaces, with a focus on loco-hauled (Freight and Passengers) trains (S-Type train). This will address current inefficiencies in integration, testing, and operation of CCS on-board systems, and enable scalable, safe, and cost-effective deployment of ATO across the Single European Railway Area (SERA).

The objectives are:

to extend, complete and formalise the set of agreed driving rules of Subset-125 and exported constraints,

to identify and standardise ATO-specific data elements required for GoA2 operation and

to improve interfaces to support the implementation of harmonised driving rules.

Background and Rationale

The current CCS TSI (Subset-125) includes clauses (from 7.1.5.2 till 7.1.5.27), also covering only some relevant aspects, to standardise the design and implementation of driving rules with particular focus on loco-hauled trains.

At the time of its release, the analysis of driving rules was incomplete, and the rules did not fully cover the diversity of operational contexts across SERA. In particular, freight trains - due to their unique kinematic and technical characteristics (e.g. length, weight, load distribution, braking systems)- require dedicated attention.

Without harmonised driving rules and standardised data interfaces, each project must independently define and implement its own logic, leading to duplicated efforts, increased costs, and delayed deployment. This change request aims to resolve these issues by defining a common framework that supports GoA2 automation. Addressing GoA2 automation also lays the foundation for further ATO grades of automation as GoA3 and GoA4.

Specific Objectives

Objective	Description	Category
1. Extend, complete and formalise the set of agreed driving rules currently only informatively referenced in Subset-125, with a focus on freight train operations.	This includes rules related inter alia to braking strategies and safe handling of longitudinal compressive forces.	Safety, Operational Performance

2. Identify and standardise ATO-specific data elements required for GoA2 operation, including train composition, track characteristics, and dynamic parameters.	These data will be integrated into the ATO and possibly ETCS data entry process and exchanged via harmonised interfaces.	Safety, Cost Reduction
3. Define clear interfaces (FIS and FFFIS) between ATO-OB/TS, ETCS-OB/TS and Rolling Stock to support the implementation of harmonised driving rules.	This will reduce integration complexity and support modular, interoperable system design.	Cost Reduction, Operational Performance
4. Develop a harmonised ATO data entry process for freight trains (S-Type trains), based on the identified ATO-specific data and operational needs.	This will ensure consistency across operators and reduce manual configuration errors.	Safety, Operational Performance
5. Demonstrate the benefits of harmonised driving rules in a GoA2 freight (S-Type train) pilot	The pilot will also assess the potential for improved safety, energy efficiency, operational harmonisation in GoA2.	Safety, Operational Performance
6. Reduce project-specific development and testing efforts through the adoption of standardised rules and interfaces.	This will be measured through stakeholder feedback and implementation metrics.	Cost Reduction

Expected Benefits

4. **Safety:** Harmonised safety barriers to prevent accidents and mitigate safety risks caused by failures of the Basic Integrity for GoA2, especially for freight trains.
5. **Operational Performance:** More efficient and consistent driving rules across operators and networks, enabling smoother GoA2 deployment.
6. **Cost Reduction:** Lower integration and testing costs for CCS on-board systems, especially for retrofitting existing freight trains (S-Type trains).

3.7 Stepwise evolution

This bundle includes analysis and considerations to facilitate predictability and stability in the systems by simplifying functional allocation and bundling of functions as well as proposals to improve ETCS compatibility.

In order to achieve an improved and eased migration between ETCS System Versions different options are analysed including adding the principles that more enhancement CRs could be classified as compatible, if the criterion “operational performance” would be excluded from the assessment of pure technical compatibility. This would increase the number of compatible track-train combinations in the future and could be done by slightly adapting today’s specification of system version management to let the current assessment be less restrictive regarding “operational performance issues”.

In addition, there is an analysis for the simplification of functional allocation including providing comprehensive list of ETCS functions which should no longer to be implemented by the ETCS trackside, e.g. ‘route suitability function’.

3.8 Telematics TSI

This bundle includes the analysis and proposals for harmonisation necessary to realise the federated variant of cross borders both for TMS and CMS

In the federated variant for TMS, each Infrastructure Manager (IM) retains full responsibility for managing all train traffic within its own network. A Network Coordinator plays a supporting and facilitative role, rather than an operational one. Specifically, the Network Coordinator supports the harmonisation of processes, provides assistance in international contingency management, and collects data for performance management across networks. It is important to note that the Network Coordinator does not execute Traffic Management commands. Instead, harmonized processes, defined either by legislation or through sectoral collaboration, ensure effective cooperation between IMs for cross-border traffic operations

In the federated variant for CMS, the coordination and harmonisation processes, as well as the overarching IT systems, are provided by a central entity that is appointed and jointly governed by the Infrastructure Managers (IMs). This central entity ensures the alignment of procedures and tools across networks. The individual IMs remain responsible for the local and national development of capacity products during the advance planning, Temporary Capacity Restrictions (TCR), and timetabling phases, while adhering to the harmonisation procedures established by the central entity.

4 Annex: CR proposed

The following links are the Polarion documents with the work of the CRs. Once approved they will be submitted to the ERA CCM database with the format required in this tool. The fields and template included in the Polarion documents may differ from each other depending on the information that was deemed necessary for the internal work of the SP for each CR. They all contain the fields that will later on be necessary for submission to ERA CCM database.

4.1 CR for recommendation REC-26

4.1.1 Cybersecurity

[SP-CR-30014-Cybersecurity update of Subset-146 - ETCS End-to-End Security Layer](#)

status: work ongoing. Planned mature solution proposal end 2025

[SP-CR-31878-Cybersecurity update of Subset-147 - CCS Consist network communication Layers FFFIS](#)

status: work ongoing. Planned mature solution proposal end 2025

[SP-CR-31890 Shared Cybersecurity Services FFFIS](#)

status: work ongoing. Planned mature solution proposal end 2025

[SP-CR-32610 Cybersecurity update of Subset-148 ATO-OB ATO-TS FFFIS Transport and Security Layers](#)

status: work ongoing. Planned mature solution proposal end 2025

[SP-CR-31943 Cybersecurity Security update for Subset-143](#)

status: work ongoing. Planned mature solution proposal Q1 2026


[SP-CR-32651 Cybersecurity TSI Telematics](#)

status: work started. Planned mature solution proposal Q1 2026

[SP-CR-32663 Cybersecurity TSI Energy](#)

status: work started. Planned mature solution proposal Q1 2026

4.1.2 On-board Modularity

 [SP-CR-26831 Update of S-147 for the limitation of the middle layer to TRDP as Ethernet technology for process data](#)

Status: Review finished. 2nd pre-assessment feedback received from ERA with agreement for REC 2026 with follow-up discussion end of November. Planned mature solution proposal end 2025.

 [SP-CR-26860 Introduction of new communication types bulk and event-based communication in addition to process data communication](#)

Status: Revision ongoing after review. 2nd pre-assessment feedback received from ERA with agreement for REC 2026 with follow-up discussion end of November. Planned mature solution proposal end 2025.

 [SP-CR-26889 Adaptation of Application Layer Subsets to an XML-based description of the communication packets](#)

Status: Review finished. 2nd pre-assessment feedback received from ERA with agreement for REC 2026 with follow-up discussion end of November. Planned mature solution proposal end 2025.

 [SP-CR-26918-Elimination of MVB and CAN from the Subsets](#)

Status: Revision ongoing. 2nd pre-assessment feedback received from ERA with agreement for REC 2026 with follow-up discussion end of November. Planned mature solution proposal end 2025.

 [SP-CR-27490 FFFIS update for Subset-027](#)

Status: Work ongoing. Planned mature solution proposal 2026.

 [SP-CR-26947 Consistency of S-147 specification with FRMCS v3 workstream](#)

Status: Work ongoing. Planned mature solution proposal 2026.

4.2 CR for recommendation REC-28

4.2.1 Operational Harmonisation

[SP-CR-32559-CR for ETCS Rulebook](#)

status: work ongoing. Planned mature solution proposal 2027

[SP-CR-10342-Driver ID \(OD\)](#)

status: revision ongoing. Planned mature solution proposal 2026

[SP-CR-10374-SH to SM transition](#)

status: revision ongoing. Planned mature solution proposal 2026

[SP-CR-10403-Track conditions in RV mode](#)

status: revision ongoing. Planned mature solution proposal 2027

[SP-CR-10432-SR initiated by trackside](#)

status: revision ongoing. Planned mature solution proposal 2026

[SP-CR-10461-LX-functionality](#)

status: revision ongoing. Planned mature solution proposal 2027

[SP-CR-17693-SH-SM button merge](#)

status: revision ongoing. Planned mature solution proposal 2026

[SP-CR-34635 SoM messages](#)

status: revision ongoing. Planned mature solution proposal 2026

4.2.2 On-board Modularity

[SP-CR-32678 Introduction of Safe Time Layer](#)

Status: Work ongoing. 2nd pre-assessment feedback received from ERA with agreement for REC 2026 with follow-up discussion end of November. Planned mature solution proposal earliest 2027

4.2.3 Train Interface enhancements

[SP-CR-07691 Addition of ETCS packet 44 on the Train interface](#)

Status: Review is finished. 2nd pre-assessment feedback received from ERA with follow-up discussion end of November. Planned mature solution proposal 2026.

[SP-CR-07697 ETCS mode provided to Rolling Stock](#)

Status: Review is finished. 2nd pre-assessment feedback received from ERA with follow-up discussion end of November. Planned mature solution proposal 2026.

[SP-CR-07698 Information on changed train data on the Train Interface](#)

Status: Review is finished. 2nd pre-assessment feedback received from ERA with follow-up discussion end of November. Planned mature solution proposal 2026.

[SP-CR-07700 NID Country on the Train Interface](#)

Status: Review is finished. 2nd pre-assessment feedback received from ERA with follow-up discussion end of November. Planned mature solution proposal 2026.

[SP-CR-07696 Exchange of Driver Entries on the Train Interface](#)

Status: Review is finished. 2nd pre-assessment feedback received from ERA with follow-up discussion end of November. Planned mature solution proposal 2026.

[SP-CR-07702 Standardised Train Length Input with higher SIL](#)

Status: Agreement from ERA in 2nd pre-assessment feedback. Revision ongoing. Planned mature solution proposal Q4 2025.

[SP-CR-18783 ETCS Odometry Data on the Train Interface](#)

Status: Review is finished. 2nd pre-assessment feedback received from ERA with follow-up discussion end of November. Planned mature solution proposal 2026.

[SP-CR-17381 Missing ETCS TI Functions in LocPas TSI](#)

Status: Mirror group review is ongoing. 2nd pre-assessment feedback received from ERA with follow-up discussion end of November. Planned mature solution proposal 2026.

[SP-CR-33502 Missing ATO TI Functions in LocPas TSI](#)

Status: Mirror group review is ongoing. Solution proposal to be prepared. 2nd pre-assessment feedback received from ERA with follow-up discussion end of November. Planned mature solution proposal 2026.

4.2.4 Odometry enhancement (former basic ASTP)

 [SP-CR-07692-ASTP/Odometry robustness enhancement](#)

status: revision ongoing. Planned mature solution proposal 2026

 [SP-CR-07695-ASTP/Odometry - Performance Target enhancement](#)

status: revision ongoing. Planned mature solution proposal 2026

 [SP-CR-11989-Localisation interface](#)

status: work ongoing. Planned mature solution proposal 2027


4.2.5 ATO GoA 1/2

 [SP-CR-32699 Management of Longitudinal Compressive Forces](#)

status: work ongoing for problem description. Planned mature solution proposal 2027

 [SP-CR-32711 Availability of Dynamic Brake](#)

status: work ongoing for problem description. Planned mature solution proposal 2027

 [SP-CR-32723 Train separation avoidance](#)

status: work ongoing for problem description. Planned mature solution proposal 2027

 [SP-CR-32735 Preventing from brake pipe exhaustion and overheating](#)

status: work ongoing for problem description. Planned mature solution proposal 2027

 [SP-CR-32747 Brake cleaning](#)

status: work ongoing for problem description. Planned mature solution proposal 2027

 [SP-CR-32772 Miscellaneous from freight train innovation pillar projects](#)

status: work ongoing for problem description. Planned mature solution proposal 2027

4.2.6 Stepwise evolution

 [SP-CR-33988 revision of subset 104 and enhanced compatibility](#)

status: work ongoing. Planned mature solution proposal 2027

 [SP-CR-33726 Removal or optionality of functions](#)

status: work ongoing. Planned mature solution proposal 2027

4.2.7 Telematics TSI

 [SP-CR- 33445 socioeconomic criteria for CMS](#)

status: work ongoing for problem description. Planned mature solution proposal 2027

 [SP-CR- 33449 priority rules for traffic management](#)

status: work ongoing for problem description. Planned mature solution proposal 2027

 [SP-CR- 33453Data exchange rules for Incident Management](#)

status: work ongoing for problemdescription. Planned mature solution proposal 2027