



ERJU SYSTEM PILLAR

Operational Vision Breakdown Alignment CCS System - Annex A Traceability Report



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Preamble






































This traceability report shows the top-down breakdown of the Operational Vision (Railway Requirements) into:



































- Operational Requirements:
Requirements to be fulfilled by an Operational Process.
- Stakeholder Requirements:
Requirements to be fulfilled by the CCS-System.
- Application Condition:
Requirements to be fulfilled neither by an Operational Process nor by the CCS-System.
Example: Requirements to be fulfilled by the Traffic Management System.



































The breakdown is done via Concept Aspects (column "Operation Vision Breakdown") which contain the analysis for the breakdown.

































Traceability Report




































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
 SPT2OD-233 - standard components	 SPP-6590 - Standard Components	 SPP-6591 - CCS shall comply with the relevant CENELEC standards	 Operational Requirement
		 SPP-6991 - CCS shall support trains equipped with ETCS Baseline 3 (ETCS Level 2 only). This means CCS will implement ETCS System Version 2 on the trackside. The implemented ETCS System Versions can be raised over time	 Stakeholder Requirement
		 SPP-7122 - Scalable, modular, multi-layered and standardised CCS architecture	 Stakeholder Requirement
		 SPP-11716 - Categorisation of system components and functional variations according to application configuration(s).	 Operational Requirement
		 SPP-14771 - External Subsystems (e.g. TMS) shall interface with CCS via standard interfaces	 Application Condition
		 SPP-15046 - TMS shall support harmonized operational process instead of national specific needs	 Application Condition
		 SPP-28337 - Standardised interfaces (FFFIS, FIS) to decouple life cycles and safety cases	 Stakeholder Requirement
		 SPP-28351 - EULYNX Standard Communication Interfaces SCI-xx	 Stakeholder Requirement
 SPT2OD-234 - long-term evolution: modularisation	 SPP-7645 - Long-term evolution: modularisation	 SPP-6860 - CCS shall be based on standardized products and configurations	 Stakeholder Requirement
		 SPP-7122 - Scalable, modular, multi-layered and standardised CCS architecture	 Stakeholder Requirement
		 SPP-7123 - Harmonized and scalable railway operation production	 Operational Requirement
		 SPP-7548 - CCS shall provide a scalable and adaptable system architecture that is suitable for different contexts depending on the IM use cases.	 Stakeholder Requirement
		 SPP-9274 - Upgradeability of Internal Components	 Stakeholder Requirement
		 SPP-10245 - Upgradeability of adjacent systems	 Stakeholder Requirement
		 SPP-10246 - Integration of external devices	


































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
			 Stakeholder Requirement
		 SPP-15046 - TMS shall support harmonized operational process instead of national specific needs	 Application Condition
		 SPP-28338 - Provide a scalable and adaptable system architecture which is suitable for different contexts	 Stakeholder Requirement
 SPT2OD-235 - Competitiveness	 SPP-7690 - Competitiveness through Merged Concept harmonized standardized processes, specifications and architectures	 SPP-6860 - CCS shall be based on standardized products and configurations	 Stakeholder Requirement
		 SPP-7122 - Scalable, modular, multi-layered and standardised CCS architecture	 Stakeholder Requirement
		 SPP-7699 - Procedures and their implementation rules variations shall be harmonized	 Operational Requirement
		 SPP-9904 - CCS shall support the tool chain provided by centralised services e.g. regarding diagnostics, configuration management, topology update	 Stakeholder Requirement
		 SPP-10174 - Decoupling of hardware and software components	 Stakeholder Requirement
		 SPP-11716 - Categorisation of system components and functional variations according to application configuration(s).	 Operational Requirement
 SPT2OD-274 - Traffic CS shall offer an optimized and automized basic functionality to control and report any type of track usage	 SPP-9034 - CCS shall offer an optimized, precise and automized basic functionality to control and report any type of track usage	 SPP-6687 - In routine operation, CCS shall support Field Force requests without the need of Field Force to have unambiguous or verbal communication with the signaller.	 Stakeholder Requirement
		 SPP-6688 - In routine operation, CCS shall support the execution of requests without the need use ambiguous or verbal communication between other actors.	 Stakeholder Requirement
		 SPP-7020 - CCS shall provide to Traffic Management System a complete, consistent and accurate status of the operational state.	 Stakeholder Requirement
		 SPP-7082 - CCS shall minimize the impact of track work on railway operations and increase the safety for the field force	 Stakeholder Requirement
		 SPP-9300 - Support for changing Operational Plans	 Stakeholder Requirement
		 SPP-10258 - Ensure fast response times	 Stakeholder Requirement
		 SPP-10259 - Timely reservation of track capacities	 Stakeholder Requirement
		 SPP-10260 - Prompt execution of requested plans	 Stakeholder Requirement




































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-14667 - TMS shall consider driver availability and train availability due to maintenance routines, construction work, incident or delays to automatically schedule a service	 Application Condition
		 SPP-14670 - TMS shall consider the track users requests and actual state of railway network to automatically schedule a service	 Application Condition
		 SPP-14824 - TMS shall consider the status of the trackside assets and trains to automatically schedule a service	 Application Condition
		 SPP-14899 - TMS shall optimize train movements in relation to each other (capacity, speed, energy consumption) and unproductive waiting times of maintenance teams or construction sites based on the track usage information received from CCS.	 Application Condition
		 SPP-14900 - TMS shall receive and manage the information on the current operating situation sent by CCS	 Application Condition
 SPT2OD-275 - ATO for normal and degraded modes	 SPP-6670 - ATO for normal and degraded modes	 SPP-6991 - CCS shall support trains equipped with ETCS Baseline 3 (ETCS Level 2 only). This means CCS will implement ETCS System Version 2 on the trackside. The implemented ETCS System Versions can be raised over time	 Stakeholder Requirement
		 SPP-7020 - CCS shall provide to Traffic Management System a complete, consistent and accurate status of the operational state.	 Stakeholder Requirement
		 SPP-7067 - Real time management of routine operational production procedures	 Operational Requirement
		 SPP-7068 - CCS shall in real time optimize the operational plans	 Stakeholder Requirement
		 SPP-7071 - Automated routine operational production procedures for train movements or shunting movements	 Operational Requirement
		 SPP-7072 - Automated routine operational production procedures for field force work	 Operational Requirement
		 SPP-7081 - CCS shall automatically supervise rail operation	 Stakeholder Requirement
		 SPP-7082 - CCS shall minimize the impact of track work on railway operations and increase the safety for the field force	 Stakeholder Requirement
		 SPP-7083 - Manned intervention in automated operation	 Operational Requirement
		 SPP-7084 - CCS shall handle different system capabilities supporting standard manual controls	 Stakeholder Requirement
		 SPP-7098 - CCS shall achieve increased standards of reliability, precision and safety	 Stakeholder Requirement


































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-7107 - Automated regulation of infrastructure resources deployment	 Operational Requirement
		 SPP-7111 - CCS shall optimize TCO through automation	 Stakeholder Requirement
		 SPP-7122 - Scalable, modular, multi-layered and standardised CCS architecture	 Stakeholder Requirement
		 SPP-7123 - Harmonized and scalable railway operation production	 Operational Requirement
		 SPP-7129 - Harmonised SERA operational rules	 Operational Requirement
		 SPP-7130 - CCS shall support technical and operational interoperability	 Stakeholder Requirement
		 SPP-7198 - Operational production shall support Migration	 Operational Requirement
		 SPP-7199 - CCS shall be flexible enabling an efficient and affordable migration	 Stakeholder Requirement
		 SPP-8839 - If driver is involved in the driving process, CCS shall support driving assistance recommendations	 Stakeholder Requirement
		 SPP-8840 - An harmonized process shall be defined to show the driver optimal energy-efficient driving and an optimised driving speed profile recommendations	 Operational Requirement
		 SPP-8866 - Implement standardised interfaces without hindering of innovation	 Stakeholder Requirement
		 SPP-9043 - An harmonized process shall be defined to support automated , efficient and fully supervised joining manoeuvres	 Operational Requirement
		 SPP-9045 - An harmonized process shall be defined to support automated splitting manoeuvres	 Operational Requirement
		 SPP-9266 - Management of variable System Capabilities	 Stakeholder Requirement
		 SPP-10233 - Supervision methodology	 Stakeholder Requirement
		 SPP-10234 - Compliance with safety-critical principles	 Stakeholder Requirement
		 SPP-10235 - Adherence to operational procedures	 Stakeholder Requirement





































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-11496 - TMS shall automatically update the operational plan in real time (in short intervals) over the entire process life-cycle	 Application Condition
		 SPP-11716 - Categorisation of system components and functional variations according to application configuration(s).	 Operational Requirement
		 SPP-12094 - Automated portions of processes "hidden" to the interfacing actor(s)	 Operational Requirement
		 SPP-14669 - In routine operation, TMS shall exchange information with CCS in a non-verbal, unambiguous and automatic way	 Application Condition
		 SPP-28346 - Implement interface designs that enable the determination of smallest common set of shareable functions	 Stakeholder Requirement
		 SPP-28347 - Handling of train and shunting movements in Traffic CS	 Stakeholder Requirement
		 SPP-28354 - Able to provide a standard interface to manage handover of trains between SERA equipped areas	 Stakeholder Requirement
 SPT2OD-276 - Track user planning via Traffic Management process	 SPP-6644 - Track user planning via Traffic Management process	 SPP-6678 - CCS shall verify and process Traffic Management System requests to create, activate, amend, deactivate or delete track usage restrictions considering TMS optimized plan.	 Stakeholder Requirement
		 SPP-6679 - An harmonized process shall be defined to automatize and optimize the activation and deactivation of planned usage restriction and to define the role or tasks carried out by trackside personnel and non-trackbound vehicles during those restrictions.	 Operational Requirement
		 SPP-6680 - An harmonized process shall be defined to automatize and optimize the activation and deactivation of unplanned usage restriction and to define the role or tasks carried out by trackside personnel and non-trackbound vehicles during those restrictions.	 Operational Requirement
		 SPP-6683 - An harmonized process shall be defined to supervise all possible track users	 Operational Requirement
		 SPP-6684 - CCS shall authorise movements only if they don't represent a danger for railway actors (such as driver or passengers), or the infrastructure and rolling stock assets, or non-track-bound track users or mobile objects and if these movements are part of plan or actions derived from degraded operation.	 Stakeholder Requirement
		 SPP-6686 - An harmonized process shall be defined to deal with remote train operation (RTO) including remote terminals (trackside or onsite).	 Operational Requirement
		 SPP-6687 - In routine operation, CCS shall support Field Force requests without the need of Field Force to have unambiguous or verbal communication with the signaller.	 Stakeholder Requirement
		 SPP-6688 - In routine operation, CCS shall support the execution of requests without the need use ambiguous or verbal communication between other actors.	 Stakeholder Requirement




































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-6960 - Field Force applications and CCS shall support a safe and performant track usage for trackbound (e.g. vehicles) and non-trackbound vehicle, and persons without creating a dangers for the traffic on the track.	 Stakeholder Requirement
		 SPP-7020 - CCS shall provide to Traffic Management System a complete, consistent and accurate status of the operational state.	 Stakeholder Requirement
		 SPP-7107 - Automated regulation of infrastructure resources deployment	 Operational Requirement
		 SPP-14667 - TMS shall consider driver availability and train availability due to maintenance routines, construction work, incident or delays to automatically schedule a service	 Application Condition
		 SPP-14668 - For planned interventions, TMS shall request reservation of track areas for field forces	 Application Condition
		 SPP-14669 - In routine operation, TMS shall exchange information with CCS in a non-verbal, unambiguous and automatic way	 Application Condition
		 SPP-14670 - TMS shall consider the track users requests and actual state of railway network to automatically schedule a service	 Application Condition
		 SPP-14785 - Track users shall be able to control infrastructure assets in-situ for maintenance routine, degradation recovery routines	 Application Condition
		 SPP-14786 - Track users shall be able to control infrastructure assets remotely for maintenance routine, degradation recovery routines	 Application Condition
		 SPP-14787 - Track users shall be able to control vehicles remotely	 Application Condition
		 SPP-14824 - TMS shall consider the status of the trackside assets and trains to automatically schedule a service	 Application Condition
		 SPP-16383 - In fully automated processes, Field Force shall request process needed actions, permissions, or asset changes via field force applications or TM terminals in or near the train	 Application Condition
		 SPP-17706 - All track users (e.g. vehicles, field force like track workers) shall send their requests, permission or needed action to TMS	 Application Condition
 SPT2OD-277 - Safety assessment on run time	 SPP-7220 - Safety assessment on runtime	 SPP-6947 - CCS shall allow movements from any point A to any point B without restrictions, if a route is available and is physically feasible.	 Stakeholder Requirement
		 SPP-8624 - An harmonised process shall be defined to systems configuration during rail operation	 Operational Requirement
		 SPP-9266 - Management of variable System Capabilities	 Stakeholder Requirement
		 SPP-9270 - Support for mixed fleet operation	


































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
			 Stakeholder Requirement
		 SPP-9274 - Upgradeability of Internal Components	 Stakeholder Requirement
		 SPP-9296 - CCS shall enable updates of Configuration Data on runtime	 Stakeholder Requirement
		 SPP-9297 - Reduction of engineering complexity	 Stakeholder Requirement
		 SPP-9298 - Minimum required Configuration Data implementation	 Stakeholder Requirement
		 SPP-9301 - Support for efficient rollout processes	 Operational Requirement
		 SPP-9303 - Execution of Safety Supervision based on predefined procedures	 Stakeholder Requirement
		 SPP-10231 - Independence from pre-engineered safety critical logic	 Stakeholder Requirement
		 SPP-10232 - Automated triggering of mitigations	 Stakeholder Requirement
		 SPP-10245 - Upgradeability of adjacent systems	 Stakeholder Requirement
		 SPP-10246 - Integration of external devices	 Stakeholder Requirement
		 SPP-10253 - Allow configuration of Generic Application according to local needs within predefined limits	 Stakeholder Requirement
		 SPP-10254 - Enable implementation of Generic Products with Safety Cases independent of Configuration Data	 Stakeholder Requirement
		 SPP-10255 - Enable implementation of Generic Applications with Safety Cases independent of Configuration Data	 Stakeholder Requirement
		 SPP-14827 - TMS shall support changes of system configuration of internal and external components during running time	 Application Condition
		 SPP-15440 - TMS shall be able to manage train mixed fleets equipped with CCS on-boards with different system versions and/or supporting different capabilities	 Application Condition
		 SPP-15441 - TMS shall define a migration strategy able to be aligned with the CCS evolution plan	 Application Condition


































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-15442 - TMS shall support the extension of automatic functions and the increased level of automation in functions already implemented.	 Application Condition
		 SPP-15528 - TMS shall enable the implementation of 'Generic Products' for its subsystems in accordance with CENELEC 50126	 Application Condition
		 SPP-15633 - TMS shall allow to define a 'Generic Application', in accordance with CENELEC 50126	 Application Condition
 SPT2OD-279 - Automation in degraded modes and system intervention	 SPP-6813 - Automation in degraded modes and system intervention	 SPP-7071 - Automated routine operational production procedures for train movements or shunting movements	 Operational Requirement
		 SPP-7072 - Automated routine operational production procedures for field force work	 Operational Requirement
		 SPP-7107 - Automated regulation of infrastructure resources deployment	 Operational Requirement
		 SPP-8624 - An harmonised process shall be defined to systems configuration during rail operation	 Operational Requirement
		 SPP-8625 - An harmonized process shall be defined to run diagnose test of a component during running time	 Operational Requirement
		 SPP-8626 - CCS shall support diagnose test of a component during running time.	 Stakeholder Requirement
		 SPP-8650 - An harmonized process shall be defined to mitigation measures to react in case of an incident	 Operational Requirement
		 SPP-8864 - CCS able to handle different and changing system capabilities of its actors during operation	 Stakeholder Requirement
		 SPP-9266 - Management of variable System Capabilities	 Stakeholder Requirement
		 SPP-9296 - CCS shall enable updates of Configuration Data on runtime	 Stakeholder Requirement
		 SPP-14827 - TMS shall support changes of system configuration of internal and external components during running time	 Application Condition
		 SPP-14828 - TMS shall support diagnose test of a component during running time	 Application Condition
		 SPP-14829 - TMS shall support CCS to automatically and safely handle pre-defined degraded modes during operation	 Application Condition
			 Application Condition



































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-14899 - TMS shall optimize train movements in relation to each other (capacity, speed, energy consumption) and unproductive waiting times of maintenance teams or construction sites based on the track usage information received from CCS.	
 SPT2OD-280 - Continuous supervision of railway production	 SPP-9039 - Continuous supervision of railway production	 SPP-6683 - An harmonized process shall be defined to supervise all possible track users	 Operational Requirement
		 SPP-6817 - Defined application configuration(s) to supervise operational production of all types of infrastructure needs and users and to automatically trigger event-related mitigations or corrective measures.	 Operational Requirement
		 SPP-6819 - CCS shall allow the definition of specific application configuration(s) for supporting the supervision of operational production of all types of infrastructure needs and users	 Stakeholder Requirement
		 SPP-6949 - CCS shall merge localisation information from train-side (e.g. position and speed) and trackside sources (e.g. track occupancy) into one safe representation as part of the operating state.	 Stakeholder Requirement
		 SPP-6952 - An harmonized process shall be defined to automatically warn and advise trackside personnel, non-trackbound vehicles, and tagged objects	 Operational Requirement
		 SPP-6957 - CCS shall support the integration of complementary sensor information and data sources that enable the supervision of vehicles as well as trackside personnel and rail customers.	 Stakeholder Requirement
		 SPP-6960 - Field Force applications and CCS shall support a safe and performant track usage for trackbound (e.g. vehicles) and non-trackbound vehicle, and persons without creating a dangers for the traffic on the track.	 Stakeholder Requirement
		 SPP-6989 - An harmonized process shall be defined to incorporate additional standard subsystems sensory information sources	 Operational Requirement
		 SPP-9037 - An harmonized process shall be defined to automatically or semi-automatic trigger pre-defined mitigation measures	 Operational Requirement
		 SPP-9038 - For non safety critical systems, an harmonized process shall be defined to configure new rules to automatically or semi-automatic trigger pre-defined mitigation measures	 Operational Requirement
		 SPP-9041 - An harmonized process shall be defined to automatically or semi-automatic detect abnormal events in the railway production using real-time "sensor fusion" information.	 Operational Requirement
		 SPP-9042 - An harmonized process shall be defined to display dynamically pre-defined assistive information	 Operational Requirement
		 SPP-9274 - Upgradeability of Internal Components	 Stakeholder Requirement
		 SPP-10245 - Upgradeability of adjacent systems	 Stakeholder Requirement
		 SPP-10246 - Integration of external devices	 Stakeholder Requirement

































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-14788 - IM shall train the operator in charge of configuration CCS System to create or adapt configurable rules for non safety critical	 Application Condition
		 SPP-14789 - IM shall train the operator interacting with CCS System to understand the advisory/ assistive information and related limitations of CCS System in case of an incident or degraded situation	 Application Condition
 SPT2OD-282 - Improved ETCS performance	 SPP-6990 - Improved ETCS performance	 SPP-6857 - CCS shall minimize the number of configuration parameters for Generic and Specific Applications	 Stakeholder Requirement
		 SPP-6860 - CCS shall be based on standardized products and configurations	 Stakeholder Requirement
		 SPP-6991 - CCS shall support trains equipped with ETCS Baseline 3 (ETCS Level 2 only). This means CCS will implement ETCS System Version 2 on the trackside. The implemented ETCS System Versions can be raised over time	 Stakeholder Requirement
		 SPP-7020 - CCS shall provide to Traffic Management System a complete, consistent and accurate status of the operational state.	 Stakeholder Requirement
		 SPP-7021 - CCS shall allow manoeuvres with cab-signalling (with no light signals) or using not-harmonised dwarf light signals.	 Stakeholder Requirement
		 SPP-7025 - CCS shall be designed to use ETCS L2 without optical (light) signals.	 Stakeholder Requirement
		 SPP-7051 - The operational processes shall be simplified in order to optimize as much as possible the commercial and operational production processes within the Railway System boundary.	 Operational Requirement
		 SPP-7052 - A process shall feature the ability of executing rolling stock routine manoeuvres for commercial operational production.	 Operational Requirement
		 SPP-7053 - CCS shall support the dynamic automated determination of train characteristics	 Stakeholder Requirement
		 SPP-7081 - CCS shall automatically supervise rail operation	 Stakeholder Requirement
		 SPP-14776 - TMS shall support the track capacity optimization through a correct and efficient use of the operational state received from CCS.	 Application Condition
 SPT2OD-283 - Optimizing track capacity	 SPP-6604 - Optimizing track capacity	 SPP-6662 - Limited allocation of infrastructure resources to train movements	 Stakeholder Requirement
		 SPP-6817 - Defined application configuration(s) to supervise operational production of all types of infrastructure needs and users and to automatically trigger event-related mitigations or corrective measures.	 Operational Requirement
		 SPP-6819 - CCS shall allow the definition of specific application configuration(s) for supporting the supervision of operational production of all types of infrastructure needs and users	 Stakeholder Requirement

































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-6820 - CCS shall support the onboard determination of track occupation - i.e. train position, length and integrity, including safety margins.	 Stakeholder Requirement
		 SPP-6821 - Dynamic track path determination	 Stakeholder Requirement
		 SPP-6949 - CCS shall merge localisation information from train-side (e.g. position and speed) and trackside sources (e.g. track occupancy) into one safe representation as part of the operating state.	 Stakeholder Requirement
		 SPP-7020 - CCS shall provide to Traffic Management System a complete, consistent and accurate status of the operational state.	 Stakeholder Requirement
		 SPP-9303 - Execution of Safety Supervision based on predefined procedures	 Stakeholder Requirement
		 SPP-10231 - Independence from pre-engineered safety critical logic	 Stakeholder Requirement
		 SPP-10232 - Automated triggering of mitigations	 Stakeholder Requirement
		 SPP-11496 - TMS shall automatically update the operational plan in real time (in short intervals) over the entire process life-cycle	 Application Condition
		 SPP-14776 - TMS shall support the track capacity optimization through a correct and efficient use of the operational state received from CCS.	 Application Condition
 SPT2OD-284 - Stable and backwards compatible air gap interface	 SPP-7268 - Stable and backward compatible air-gap interface	 SPP-6949 - CCS shall merge localisation information from train-side (e.g. position and speed) and trackside sources (e.g. track occupancy) into one safe representation as part of the operating state.	 Stakeholder Requirement
		 SPP-6991 - CCS shall support trains equipped with ETCS Baseline 3 (ETCS Level 2 only). This means CCS will implement ETCS System Version 2 on the trackside. The implemented ETCS System Versions can be raised over time	 Stakeholder Requirement
		 SPP-7021 - CCS shall allow manoeuvres with cab-signalling (with no light signals) or using not-harmonised dwarf light signals.	 Stakeholder Requirement
		 SPP-7025 - CCS shall be designed to use ETCS L2 without optical (light) signals.	 Stakeholder Requirement
		 SPP-7082 - CCS shall minimize the impact of track work on railway operations and increase the safety for the field force	 Stakeholder Requirement
		 SPP-7084 - CCS shall handle different system capabilities supporting standard manual controls	 Stakeholder Requirement
		 SPP-7122 - Scalable, modular, multi-layered and standardised CCS architecture	 Stakeholder Requirement
		 SPP-7663 - Implementation of TSI	





































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
			 Stakeholder Requirement
		 SPP-7664 - Application configurations shall support backward compatibility	 Operational Requirement
		 SPP-7668 - ATO GoA 3/4	 Stakeholder Requirement
		 SPP-8839 - If driver is involved in the driving process, CCS shall support driving assistance recommendations	 Stakeholder Requirement
		 SPP-8840 - An harmonized process shall be defined to show the driver optimal energy-efficient driving and an optimised driving speed profile recommendations	 Operational Requirement
		 SPP-8863 - CCS designed to reduce OPEX	 Stakeholder Requirement
		 SPP-8864 - CCS able to handle different and changing system capabilities of its actors during operation	 Stakeholder Requirement
		 SPP-8865 - CCS shall reduce engineering complexity	 Stakeholder Requirement
		 SPP-8866 - Implement standardised interfaces without hindering of innovation	 Stakeholder Requirement
		 SPP-8867 - Support Backward compatibility within the Target System architecture	 Stakeholder Requirement
		 SPP-9266 - Management of variable System Capabilities	 Stakeholder Requirement
		 SPP-11716 - Categorisation of system components and functional variations according to application configuration(s).	 Operational Requirement
		 SPP-15441 - TMS shall define a migration strategy able to be aligned with the CCS evolution plan	 Application Condition
		 SPP-15442 - TMS shall support the extension of automatic functions and the increased level of automation in functions already implemented.	 Application Condition
		 SPP-15538 - TMS shall support CCS backwards compatibility feature	 Application Condition
		 SPP-28338 - Provide a scalable and adaptable system architecture which is suitable for different contexts	 Stakeholder Requirement
		 SPP-28346 - Implement interface designs that enable the determination of smallest common set of shareable functions	 Stakeholder Requirement



































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-28354 - Able to provide a standard interface to manage handover of trains between SERA equipped areas	 Stakeholder Requirement
 SPT2OD-286 - Train CS shall offer all basic onboard functionalities for subprocesses concerning TM/CM, ATO and ATP (ETCS) happening in trains or train units			
 SPT2OD-288 - ATO			
 SPT2OD-289 - Driver advisory systems	 SPP-8841 - SPT2TRAFFIC-6084 - Driver advisory systems	 SPP-8839 - If driver is involved in the driving process, CCS shall support driving assistance recommendations	 Stakeholder Requirement
		 SPP-8840 - An harmonized process shall be defined to show the driver optimal energy-efficient driving and an optimised driving speed profile recommendations	 Operational Requirement
 SPT2OD-290 - Optimizing track capacity			
 SPT2OD-292 - Field Force Applications, Control and Supervision shall support a safe and performant trackusage (basif functionality) for objects, vehicles and persons which are not track-bound and which shall not create dangers for the traffick on track	 SPP-6946 - Field Force safety applications for non-trackbound objects, vehicles and persons	 SPP-6679 - An harmonized process shall be defined to automatize and optimize the activation and deactivation of planned usage restriction and to define the role or tasks carried out by trackside personnel and non-trackbound vehicles during those restrictions.	 Operational Requirement
		 SPP-6680 - An harmonized process shall be defined to automatize and optimize the activation and deactivation of unplanned usage restriction and to define the role or tasks carried out by trackside personnel and non-trackbound vehicles during those restrictions.	 Operational Requirement
		 SPP-6683 - An harmonized process shall be defined to supervise all possible track users	 Operational Requirement
		 SPP-6684 - CCS shall authorise movements only if they don't represent a danger for railway actors (such as driver or passengers), or the infrastructure and rolling stock assets, or non-track-bound track users or mobile objects and if these movements are part of plan or actions derived from degraded operation.	 Stakeholder Requirement
		 SPP-6687 - In routine operation, CCS shall support Field Force requests without the need of Field Force to have unambiguous or verbal communication with the signaller.	 Stakeholder Requirement
		 SPP-6688 - In routine operation, CCS shall support the execution of requests without the need use ambiguous or verbal communication between other actors.	 Stakeholder Requirement
		 SPP-6952 - An harmonized process shall be defined to automatically warn and advise trackside personnel, non-trackbound vehicles, and tagged objects	 Operational Requirement
		 SPP-6953 - An harmonized process shall be defined to access and entry of a construction site vehicle	 Operational Requirement
		 SPP-6954 - An harmonized process shall be defined to locally operate trackside assets or local maintenance of trackside assets and define the role of Field Force during this operation.	 Operational Requirement
		 SPP-6955 - An harmonized process shall be defined to perform manually train composition and define the role of Field Force and Driver during this operation.	 Operational Requirement









































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-6957 - CCS shall support the integration of complementary sensor information and data sources that enable the supervision of vehicles as well as trackside personnel and rail customers.	 Stakeholder Requirement
		 SPP-6960 - Field Force applications and CCS shall support a safe and performant track usage for trackbound (e.g. vehicles) and non-trackbound vehicle, and persons without creating a dangers for the traffic on the track.	 Stakeholder Requirement
		 SPP-7082 - CCS shall minimize the impact of track work on railway operations and increase the safety for the field force	 Stakeholder Requirement
		 SPP-7107 - Automated regulation of infrastructure resources deployment	 Operational Requirement
		 SPP-14793 - In routine operation, track workers and drivers shall use the non-verbal, unambiguous communication with CCS instead of the verbal communication with Signaller	 Application Condition
 SPT2OD-293 - Reduce production impact	 SPP-9269 - Reduce railway service production impact	 SPP-6683 - An harmonized process shall be defined to supervise all possible track users	 Operational Requirement
		 SPP-6687 - In routine operation, CCS shall support Field Force requests without the need of Field Force to have unambiguous or verbal communication with the signaller.	 Stakeholder Requirement
		 SPP-6688 - In routine operation, CCS shall support the execution of requests without the need use ambiguous or verbal communication between other actors.	 Stakeholder Requirement
		 SPP-6952 - An harmonized process shall be defined to automatically warn and advise trackside personnel, non-trackbound vehicles, and tagged objects	 Operational Requirement
		 SPP-6957 - CCS shall support the integration of complementary sensor information and data sources that enable the supervision of vehicles as well as trackside personnel and rail customers.	 Stakeholder Requirement
		 SPP-6960 - Field Force applications and CCS shall support a safe and performant track usage for trackbound (e.g. vehicles) and non-trackbound vehicle, and persons without creating a dangers for the traffic on the track.	 Stakeholder Requirement
		 SPP-7052 - A process shall feature the ability of executing rolling stock routine manoeuvres for commercial operational production.	 Operational Requirement
		 SPP-7054 - CCS shall autonomously supervise the routine procedures for the handing over of safety responsibility	 Stakeholder Requirement
		 SPP-7071 - Automated routine operational production procedures for train movements or shunting movements	 Operational Requirement
		 SPP-7072 - Automated routine operational production procedures for field force work	 Operational Requirement
		 SPP-7082 - CCS shall minimize the impact of track work on railway operations and increase the safety for the field force	 Stakeholder Requirement







































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-7107 - Automated regulation of infrastructure resources deployment	 Operational Requirement
		 SPP-14667 - TMS shall consider driver availability and train availability due to maintenance routines, construction work, incident or delays to automatically schedule a service	 Application Condition
		 SPP-14669 - In routine operation, TMS shall exchange information with CCS in a non-verbal, unambiguous and automatic way	 Application Condition
		 SPP-15529 - CCS shall support carrying out maintenance activities under production without blocking a track	 Stakeholder Requirement
		 SPP-15530 - An harmonised process and its limitation shall define to carry out maintenance activities under production without the need of blocking a track	 Operational Requirement
		 SPP-15531 - Field Force applications shall support a safe and performant track usage for trackbound and non-trackbound vehicle, and persons without creating a dangers for the traffic on the track.	 Application Condition
		 SPP-15532 - IM/RU shall plan routine operations including train traffic routines and supporting routines like construction and maintenance activities	 Application Condition
		 SPP-15865 - In normal operation, Field Forces shall support non verbal communication with CCS in the execution of railway services	 Application Condition
 SPT2OD-294 - Automated field force protection	 SPP-7022 - Automated field force protection	 SPP-6679 - An harmonized process shall be defined to automatize and optimize the activation and deactivation of planned usage restriction and to define the role or tasks carried out by trackside personnel and non-trackbound vehicles during those restrictions.	 Operational Requirement
		 SPP-6680 - An harmonized process shall be defined to automatize and optimize the activation and deactivation of unplanned usage restriction and to define the role or tasks carried out by trackside personnel and non-trackbound vehicles during those restrictions.	 Operational Requirement
		 SPP-6683 - An harmonized process shall be defined to supervise all possible track users	 Operational Requirement
		 SPP-6684 - CCS shall authorise movements only if they don't represent a danger for railway actors (such as driver or passengers), or the infrastructure and rolling stock assets, or non-track-bound track users or mobile objects and if these movements are part of plan or actions derived from degraded operation.	 Stakeholder Requirement
		 SPP-6687 - In routine operation, CCS shall support Field Force requests without the need of Field Force to have unambiguous or verbal communication with the signaller.	 Stakeholder Requirement
		 SPP-6688 - In routine operation, CCS shall support the execution of requests without the need use ambiguous or verbal communication between other actors.	 Stakeholder Requirement
		 SPP-6952 - An harmonized process shall be defined to automatically warn and advise trackside personnel, non-trackbound vehicles, and tagged objects	 Operational Requirement







































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-6953 - An harmonized process shall be defined to access and entry of a construction site vehicle	 Operational Requirement
		 SPP-6954 - An harmonized process shall be defined to locally operate trackside assets or local maintenance of trackside assets and define the role of Field Force during this operation.	 Operational Requirement
		 SPP-6955 - An harmonized process shall be defined to perform manually train composition and define the role of Field Force and Driver during this operation.	 Operational Requirement
		 SPP-6957 - CCS shall support the integration of complementary sensor information and data sources that enable the supervision of vehicles as well as trackside personnel and rail customers.	 Stakeholder Requirement
		 SPP-6960 - Field Force applications and CCS shall support a safe and performant track usage for trackbound (e.g. vehicles) and non-trackbound vehicle, and persons without creating a dangers for the traffic on the track.	 Stakeholder Requirement
		 SPP-6989 - An harmonized process shall be defined to incorporate additional standard subsystems sensory information sources	 Operational Requirement
		 SPP-7082 - CCS shall minimize the impact of track work on railway operations and increase the safety for the field force	 Stakeholder Requirement
		 SPP-14794 - During maintenance and construction activities, non-trackbound vehicles, construction equipment, and tagged objects shall be trackable bear the tracks	 Application Condition
		 SPP-15531 - Field Force applications shall support a safe and performant track usage for trackbound and non-trackbound vehicle, and persons without creating a dangers for the traffic on the track.	 Application Condition
 SPT2OD-295 - Efficient and cheaper warning systems	 SPP-7024 - Efficient and cheaper warning systems	 SPP-6683 - An harmonized process shall be defined to supervise all possible track users	 Operational Requirement
		 SPP-6952 - An harmonized process shall be defined to automatically warn and advise trackside personnel, non-trackbound vehicles, and tagged objects	 Operational Requirement
		 SPP-6960 - Field Force applications and CCS shall support a safe and performant track usage for trackbound (e.g. vehicles) and non-trackbound vehicle, and persons without creating a dangers for the traffic on the track.	 Stakeholder Requirement
		 SPP-7051 - The operational processes shall be simplified in order to optimize as much as possible the commercial and operational production processes within the Railway System boundary.	 Operational Requirement
		 SPP-7054 - CCS shall autonomously supervise the routine procedures for the handing over of safety responsibility	 Stakeholder Requirement
		 SPP-7055 - An harmonized process shall defined to execution safety-related mitigation measures for Track Workers protection	 Operational Requirement




































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-14819 - Warning system shall be reliable (low number of false positives and low number false negatives)	 Application Condition
		 SPP-14820 - Warning system shall be rapid to install	 Application Condition
		 SPP-16242 - Warning system shall detect threats for non-trackbound vehicles, tagged objects, and construction equipment near tracks during maintenance and during construction activities	 Application Condition
 SPT2OD-297 - Trackside Asset CS allows to control a broad heterogeneity of systems and technologies in a standardized way	 SPP-8622 - CCS allows to control a broad heterogeneity of trackside assets technologies in a standardized way	 SPP-8810 - CCS shall base the information exchange to/from subsystem component on standard communication interfaces that shall be defined up to the physical layer.	 Stakeholder Requirement
 SPT2OD-299 - The Transversal Systems shall offer efficient and automated support to manage asset data, technical asset status information (for diagnostics), configurations of CCS systems, security, and integrated user interfaces			
 SPT2OD-301 - The quantitative targets for PRAMSS shall fulfil the needs of the System Pillar stakeholders, in a scalable relation to the cost they create			
 SPT2OD-304 - Reduced TCO	 SPP-9472 - Achieving a reduced TCO	 SPP-7082 - CCS shall minimize the impact of track work on railway operations and increase the safety for the field force	 Stakeholder Requirement
		 SPP-7084 - CCS shall handle different system capabilities supporting standard manual controls	 Stakeholder Requirement
		 SPP-9644 - CCS shall acquire the static properties of the infrastructure (e.g. tracks with speed and gradient profiles) from a centralised service).	 Stakeholder Requirement
		 SPP-9645 - CCS shall acquire system configuration data from a centralised service via a standardised interface, based on EULYNX SMI-xx.	 Stakeholder Requirement
		 SPP-9647 - CCS shall acquire the static properties of the trains (e.g. loading gauge) from a centralised service.	 Stakeholder Requirement
		 SPP-9870 - CCS shall follow modular design principles	 Stakeholder Requirement
		 SPP-10254 - Enable implementation of Generic Products with Safety Cases independent of Configuration Data	 Stakeholder Requirement
		 SPP-10255 - Enable implementation of Generic Applications with Safety Cases independent of Configuration Data	 Stakeholder Requirement
		 SPP-28338 - Provide a scalable and adaptable system architecture which is suitable for different contexts	 Stakeholder Requirement
 SPT2OD-305 - Positive business case	 SPP-9495 - Positive business case	 SPP-6934 - CCS shall be able to handle the specific capabilities and characteristics of the train units when executing train movements	 Stakeholder Requirement





































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-7199 - CCS shall be flexible enabling an efficient and affordable migration	 Stakeholder Requirement
		 SPP-9469 - CCS shall support scalable PRAMSS targets	 Stakeholder Requirement
		 SPP-9496 - CCS shall be adaptable to local performance requirements by ensuring the scalability of its software components	 Stakeholder Requirement
		 SPP-9513 - CCS shall be based on Generic Products that can be configured using openly available configuration parameters to address varying application needs	 Stakeholder Requirement
		 SPP-10174 - Decoupling of hardware and software components	 Stakeholder Requirement
		 SPP-10254 - Enable implementation of Generic Products with Safety Cases independent of Configuration Data	 Stakeholder Requirement
		 SPP-10255 - Enable implementation of Generic Applications with Safety Cases independent of Configuration Data	 Stakeholder Requirement
		 SPP-14326 - CCS shall use reference models, reference laboratories and automated compliance testing in accordance with the European approval procedure (CENELEC phases 6 to 9)	 Stakeholder Requirement
		 SPP-15046 - TMS shall support harmonized operational process instead of national specific needs	 Application Condition
 SPT2OD-306 - TCO Optimization	 SPP-9542 - TCO optimization	 SPP-6857 - CCS shall minimize the number of configuration parameters for Generic and Specific Applications	 Stakeholder Requirement
		 SPP-6858 - CCS shall rely on a standardized set of manual controls for normal operations, based on harmonised operational rules	 Operational Requirement
		 SPP-6859 - CCS shall rely on a standardized set of manual controls for degraded operations, based on harmonized operational rules	 Operational Requirement
		 SPP-7111 - CCS shall optimize TCO through automation	 Stakeholder Requirement
		 SPP-9553 - CCS Hardware, Software and Engineering Data shall be independently upgradeable to minimize engineering efforts and reduce deployment time.	 Stakeholder Requirement
		 SPP-9554 - CCS shall follow a generic safety approach in encapsulating safety relevant functions within building blocks with a separate safety approvals	 Stakeholder Requirement
		 SPP-9555 - CCS shall ensure decoupled lifecycles for its components to simplify asset management	 Stakeholder Requirement








































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-9894 - CCS shall implement an architecture based on standardised interfaces to facilitate independent safety cases and approval processes for each subsystem	 Stakeholder Requirement
		 SPP-14771 - External Subsystems (e.g. TMS) shall interface with CCS via standard interfaces	 Application Condition
		 SPP-15046 - TMS shall support harmonized operational process instead of national specific needs	 Application Condition
		 SPP-15079 - Track users shall support harmonized operational processes instead of national specific needs	 Application Condition
		 SPP-28353 - As a Supplier, I want a Traffic CS system implementing an architecture based on standardized interfaces	 Stakeholder Requirement
 SPT2OD-307 - Unit prices	 SPP-9556 - Unit prices	 SPP-6860 - CCS shall be based on standardized products and configurations	 Stakeholder Requirement
		 SPP-8864 - CCS able to handle different and changing system capabilities of its actors during operation	 Stakeholder Requirement
 SPT2OD-309 - Operational process harmonization	 SPP-6664 - Operational process harmonization	 SPP-6857 - CCS shall minimize the number of configuration parameters for Generic and Specific Applications	 Stakeholder Requirement
		 SPP-6858 - CCS shall rely on a standardized set of manual controls for normal operations, based on harmonised operational rules	 Operational Requirement
		 SPP-6859 - CCS shall rely on a standardized set of manual controls for degraded operations, based on harmonized operational rules	 Operational Requirement
		 SPP-6860 - CCS shall be based on standardized products and configurations	 Stakeholder Requirement
		 SPP-15046 - TMS shall support harmonized operational process instead of national specific needs	 Application Condition
 SPT2OD-310 - Re-use	 SPP-9613 - Re-use	 SPP-6858 - CCS shall rely on a standardized set of manual controls for normal operations, based on harmonised operational rules	 Operational Requirement
		 SPP-6859 - CCS shall rely on a standardized set of manual controls for degraded operations, based on harmonized operational rules	 Operational Requirement
		 SPP-6881 - The operational processes involving trackside personnel and non-trackbound vehicles shall be optimized, in order to reduce their impact on railway operations.	 Operational Requirement
		 SPP-9614 - CCS shall implement an architecture based on standardized interfaces to enable the integration of components from multiple suppliers	 Stakeholder Requirement
		 SPP-10253 - Allow configuration of Generic Application according to local needs within predefined limits	 Stakeholder Requirement







































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-10254 - Enable implementation of Generic Products with Safety Cases independent of Configuration Data	 Stakeholder Requirement
		 SPP-10255 - Enable implementation of Generic Applications with Safety Cases independent of Configuration Data	 Stakeholder Requirement
 SPT2OD-311 - Upgradeability	 SPP-9615 - Upgradeability	 SPP-6938 - CCS shall implement functionalities that allow the use and combination of different types of sensor technologies and information	 Stakeholder Requirement
		 SPP-8864 - CCS able to handle different and changing system capabilities of its actors during operation	 Stakeholder Requirement
		 SPP-8866 - Implement standardised interfaces without hindering of innovation	 Stakeholder Requirement
		 SPP-9901 - CCS shall be designed in such a way that specified components can be replaced and interconnected without the need to re-approve other components	 Stakeholder Requirement
		 SPP-10174 - Decoupling of hardware and software components	 Stakeholder Requirement
		 SPP-28338 - Provide a scalable and adaptable system architecture which is suitable for different contexts	 Stakeholder Requirement
		 SPP-28346 - Implement interface designs that enable the determination of smallest common set of shareable functions	 Stakeholder Requirement
 SPT2OD-315 - Simplified, modular architecture to avoid redundancies	 SPP-9927 - Simplified, modular architecture to avoid redundancies	 SPP-7020 - CCS shall provide to Traffic Management System a complete, consistent and accurate status of the operational state.	 Stakeholder Requirement
		 SPP-7122 - Scalable, modular, multi-layered and standardised CCS architecture	 Stakeholder Requirement
		 SPP-9274 - Upgradeability of Internal Components	 Stakeholder Requirement
		 SPP-9296 - CCS shall enable updates of Configuration Data on runtime	 Stakeholder Requirement
		 SPP-9660 - CCS shall disclose incompatibilities between its subsystems and their interfaces during runtime.	 Stakeholder Requirement
		 SPP-9856 - Usage of FRMCS and GSM-R	 Stakeholder Requirement
		 SPP-9870 - CCS shall follow modular design principles	 Stakeholder Requirement
		 SPP-9942 - Use standard hardware components	 Stakeholder Requirement









































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-10174 - Decoupling of hardware and software components	 Stakeholder Requirement
		 SPP-10245 - Upgradeability of adjacent systems	 Stakeholder Requirement
		 SPP-10246 - Integration of external devices	 Stakeholder Requirement
		 SPP-14827 - TMS shall support changes of system configuration of internal and external components during running time	 Application Condition
		 SPP-15534 - TMS shall consider the CCS PRAMSS requirements when defining TMS PRAMSS requirements	 Application Condition
		 SPP-15535 - TMS shall comply with the ARC-D2.3 Granularity Concepts and Principles for designing TMS architecture	 Application Condition
 SPT2OD-316 - Improved change process and backwards compatibility			
 SPT2OD-317 - Decoupling of asset life cycle	 SPP-9621 - Decoupling of asset life cycle	 SPP-7122 - Scalable, modular, multi-layered and standardised CCS architecture	 Stakeholder Requirement
		 SPP-9553 - CCS Hardware, Software and Engineering Data shall be independently upgradeable to minimize engineering efforts and reduce deployment time.	 Stakeholder Requirement
		 SPP-14326 - CCS shall use reference models, reference laboratories and automated compliance testing in accordance with the European approval procedure (CENELEC phases 6 to 9)	 Stakeholder Requirement
		 SPP-28351 - EULYNX Standard Communication Interfaces SCI-xx	 Stakeholder Requirement
 SPT2OD-320 - Reduced amount of skill needs	 SPP-9928 - Reduced amount of skill needs	 SPP-6858 - CCS shall rely on a standardized set of manual controls for normal operations, based on harmonised operational rules	 Operational Requirement
		 SPP-6859 - CCS shall rely on a standardized set of manual controls for degraded operations, based on harmonized operational rules	 Operational Requirement
		 SPP-6860 - CCS shall be based on standardized products and configurations	 Stakeholder Requirement
		 SPP-6881 - The operational processes involving trackside personnel and non-trackbound vehicles shall be optimized, in order to reduce their impact on railway operations.	 Operational Requirement
		 SPP-7129 - Harmonised SERA operational rules	 Operational Requirement
		 SPP-7130 - CCS shall support technical and operational interoperability	 Stakeholder Requirement
		 SPP-9297 - Reduction of engineering complexity	






































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
			 Stakeholder Requirement
		 SPP-9298 - Minimum required Configuration Data implementation	 Stakeholder Requirement
		 SPP-9679 - CCS shall implement standardised diagnostics functions and standardised interfaces for faster root cause analysis, recovery processes, failure prediction and prevention.	 Stakeholder Requirement
		 SPP-9681 - An harmonized process shall be defined to report, store and distribute diagnosis information to/from a centralised system.	 Operational Requirement
		 SPP-9904 - CCS shall support the tool chain provided by centralised services e.g. regarding diagnostics, configuration management, topology update	 Stakeholder Requirement
		 SPP-9935 - Standardisation and automation of operational processes to reduce training and increase safety of personnel	 Operational Requirement
		 SPP-9942 - Use standard hardware components	 Stakeholder Requirement
		 SPP-14896 - IMs and RUs shall train operators and drivers using the harmonized operational processes instead of national rules	 Application Condition
		 SPP-15046 - TMS shall support harmonized operational process instead of national specific needs	 Application Condition
 SPT2OD-321 - Scalability of skills	 SPP-6874 - Scalability of skills	 SPP-6881 - The operational processes involving trackside personnel and non-trackbound vehicles shall be optimized, in order to reduce their impact on railway operations.	 Operational Requirement
		 SPP-6882 - CCS shall support advisory systems	 Stakeholder Requirement
		 SPP-14326 - CCS shall use reference models, reference laboratories and automated compliance testing in accordance with the European approval procedure (CENELEC phases 6 to 9)	 Stakeholder Requirement
		 SPP-14896 - IMs and RUs shall train operators and drivers using the harmonized operational processes instead of national rules	 Application Condition
 SPT2OD-326 - Reduction of trackside CCS assets	 SPP-10108 - Reduction of trackside CCS assets	 SPP-6931 - CCS shall allow a visual representation of the complete, consistent and accurate status of the operational situation	 Stakeholder Requirement
		 SPP-6932 - Signaller shall have a visual representation of the complete, consistent and accurate status of the operational situation	 Operational Requirement
		 SPP-6935 - Signaller shall have a visual representation of malfunctioning devices and their impact on the operational situation	 Operational Requirement









































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-6936 - CCS shall allow a visual representation malfunctioning devices and their impact on the operational situation	 Stakeholder Requirement
		 SPP-6938 - CCS shall implement functionalities that allow the use and combination of different types of sensor technologies and information	 Stakeholder Requirement
		 SPP-7025 - CCS shall be designed to use ETCS L2 without optical (light) signals.	 Stakeholder Requirement
		 SPP-10109 - CCS shall support system deployment on centralised data centers.	 Stakeholder Requirement
		 SPP-10110 - CCS shall support the separation between the central system and decentralised lineside devices	 Stakeholder Requirement
		 SPP-11496 - TMS shall automatically update the operational plan in real time (in short intervals) over the entire process life-cycle	 Application Condition
		 SPP-14776 - TMS shall support the track capacity optimization through a correct and efficient use of the operational state received from CCS.	 Application Condition
		 SPP-14824 - TMS shall consider the status of the trackside assets and trains to automatically schedule a service	 Application Condition
 SPT2OD-327 - Simplified process for planning and installing CCS systems	 SPP-9686 - Simplified process for planning and installing CCS systems	 SPP-9297 - Reduction of engineering complexity	 Stakeholder Requirement
		 SPP-9298 - Minimum required Configuration Data implementation	 Stakeholder Requirement
		 SPP-9614 - CCS shall implement an architecture based on standardized interfaces to enable the integration of components from multiple suppliers	 Stakeholder Requirement
		 SPP-10254 - Enable implementation of Generic Products with Safety Cases independent of Configuration Data	 Stakeholder Requirement
		 SPP-10255 - Enable implementation of Generic Applications with Safety Cases independent of Configuration Data	 Stakeholder Requirement
		 SPP-14326 - CCS shall use reference models, reference laboratories and automated compliance testing in accordance with the European approval procedure (CENELEC phases 6 to 9)	 Stakeholder Requirement
		 SPP-14821 - Railway Authorities shall be trained of the scope and respectively limitations of the SERA automated compliance testing for new installation	 Application Condition
		 SPP-15528 - TMS shall enable the implementation of 'Generic Products' for its subsystems in accordance with CENELEC 50126	 Application Condition
		 SPP-15633 - TMS shall allow to define a 'Generic Application', in accordance with CENELEC 50126	 Application Condition







































Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
 SPT2OD-328 - Selective on demand replacements	 SPP-10228 - Selective on demand replacements	 SPP-9274 - Upgradeability of Internal Components	 Stakeholder Requirement
		 SPP-9301 - Support for efficient rollout processes	 Operational Requirement
		 SPP-10230 - Integration of external devices	 Stakeholder Requirement
		 SPP-10245 - Upgradeability of adjacent systems	 Stakeholder Requirement
		 SPP-10246 - Integration of external devices	 Stakeholder Requirement
		 SPP-14827 - TMS shall support changes of system configuration of internal and external components during running time	 Application Condition
 SPT2OD-329 - Optimizing track capacity	 SPP-6890 - Optimizing track capacity	 SPP-6931 - CCS shall allow a visual representation of the complete, consistent and accurate status of the operational situation	 Stakeholder Requirement
		 SPP-6932 - Signaller shall have a visual representation of the complete, consistent and accurate status of the operational situation	 Operational Requirement
		 SPP-6934 - CCS shall be able to handle the specific capabilities and characteristics of the train units when executing train movements	 Stakeholder Requirement
		 SPP-6935 - Signaller shall have a visual representation of malfunctioning devices and their impact on the operational situation	 Operational Requirement
		 SPP-6936 - CCS shall allow a visual representation malfunctioning devices and their impact on the operational situation	 Stakeholder Requirement
		 SPP-6938 - CCS shall implement functionalities that allow the use and combination of different types of sensor technologies and information	 Stakeholder Requirement
		 SPP-6940 - CCS shall deploy and use future sensor technology, based on defined Standard Interfaces) with no impact on the Traffic CS safety logic	 Stakeholder Requirement
		 SPP-6941 - CCS shall perform periodical self-tests and self-diagnostics of its vital functions	 Stakeholder Requirement
		 SPP-11496 - TMS shall automatically update the operational plan in real time (in short intervals) over the entire process life-cycle	 Application Condition
		 SPP-14776 - TMS shall support the track capacity optimization through a correct and efficient use of the operational state received from CCS.	 Application Condition
	 SPP-6930 - Optimizing track capacity (SPT2OD-329)	 SPP-6947 - CCS shall allow movements from any point A to any point B without restrictions, if a route is available and is physically feasible.	 Stakeholder Requirement









Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-6948 - Traffic CS shall support driving in relative braking distance, managed by trackside infrastructure.	 Stakeholder Requirement
		 SPP-6949 - CCS shall merge localisation information from train-side (e.g. position and speed) and trackside sources (e.g. track occupancy) into one safe representation as part of the operating state.	 Stakeholder Requirement
		 SPP-6950 - CCS shall support virtual coupling of trains, with train-to-train communication.	 Stakeholder Requirement
		 SPP-6956 - As an Infrastructure Manager, I want Traffic CS to make available a complete, consistent, accurate and up-to-date operating state.	 Operational Requirement
		 SPP-6957 - CCS shall support the integration of complementary sensor information and data sources that enable the supervision of vehicles as well as trackside personnel and rail customers.	 Stakeholder Requirement
		 SPP-7020 - CCS shall provide to Traffic Management System a complete, consistent and accurate status of the operational state.	 Stakeholder Requirement
		 SPP-10259 - Timely reservation of track capacities	 Stakeholder Requirement
		 SPP-11496 - TMS shall automatically update the operational plan in real time (in short intervals) over the entire process life-cycle	 Application Condition
		 SPP-14776 - TMS shall support the track capacity optimization through a correct and efficient use of the operational state received from CCS.	 Application Condition
 SPT2OD-330 - Mixed system versions	 SPP-10107 - Mixed ETCS System Versions	 SPP-14132 - CCS subsystems and their interfaces version compatibility	 Stakeholder Requirement
		 SPP-14133 - CCS system shall provide standardised interfaces	 Stakeholder Requirement
		 SPP-14897 - From a CONEMP perspective, backward compatibility should not only be an on-board...	 Application Condition
		 SPP-15440 - TMS shall be able to manage train mixed fleets equipped with CCS on-boards with different system versions and/or supporting different capabilities	 Application Condition
		 SPP-15441 - TMS shall define a migration strategy able to be aligned with the CCS evolution plan	 Application Condition
 SPT2OD-331 - Independent asset life cycle	 SPP-9687 - Independent asset life cycle	 SPP-8624 - An harmonised process shall be defined to systems configuration during rail operation	 Operational Requirement
		 SPP-9296 - CCS shall enable updates of Configuration Data on runtime	 Stakeholder Requirement
		 SPP-14823 - TMS shall have a completely independent lifecycle	 Application Condition

Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-14825 - TMS shall acquire system configuration data for infrastructure and vehicle systems from the same centralised service used by CCS using a standard interface	 Application Condition
		 SPP-14827 - TMS shall support changes of system configuration of internal and external components during running time	 Application Condition
 SPT2OD-332 - Data acquisition	 SPP-9648 - Data acquisition	 SPP-7020 - CCS shall provide to Traffic Management System a complete, consistent and accurate status of the operational state.	 Stakeholder Requirement
		 SPP-9644 - CCS shall acquire the static properties of the infrastructure (e.g. tracks with speed and gradient profiles) from a centralised service).	 Stakeholder Requirement
		 SPP-9645 - CCS shall acquire system configuration data from a centralised service via a standardised interface, based on EULYNX SMI-xx.	 Stakeholder Requirement
		 SPP-9647 - CCS shall acquire the static properties of the trains (e.g. loading gauge) from a centralised service.	 Stakeholder Requirement
		 SPP-14116 - An harmonized process shall be defined to acquire data configuration related with railway infrastructure	 Operational Requirement
		 SPP-14117 - An harmonized process shall be defined to acquire data configuration related with train composition	 Stakeholder Requirement
		 SPP-14118 - An harmonized process shall be defined for automatic generation of data configuration using different technologies	 Stakeholder Requirement
		 SPP-14824 - TMS shall consider the status of the trackside assets and trains to automatically schedule a service	 Application Condition
 SPT2OD-333 - Reduced special hardware	 SPP-9943 - Reduce special hardware	 SPP-9496 - CCS shall be adaptable to local performance requirements by ensuring the scalability of its software components	 Stakeholder Requirement
		 SPP-9942 - Use standard hardware components	 Stakeholder Requirement
		 SPP-10174 - Decoupling of hardware and software components	 Stakeholder Requirement
 SPT2OD-334 - Data center deployment	 SPP-10111 - Data center deployment	 SPP-9679 - CCS shall implement standardised diagnostics functions and standardised interfaces for faster root cause analysis, recovery processes, failure prediction and prevention.	 Stakeholder Requirement
		 SPP-9681 - An harmonized process shall be defined to report, store and distribute diagnosis information to/from a centralised system.	 Operational Requirement
		 SPP-9904 - CCS shall support the tool chain provided by centralised services e.g. regarding diagnostics, configuration management, topology update	 Stakeholder Requirement
		 SPP-10109 - CCS shall support system deployment on centralised data centers.	 Stakeholder Requirement

Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-10110 - CCS shall support the separation between the central system and decentralised lineside devices	 Stakeholder Requirement
		 SPP-14825 - TMS shall acquire system configuration data for infrastructure and vehicle systems from the same centralised service used by CCS using a standard interface	 Application Condition
		 SPP-14826 - TMS shall use the same centralized diagnostic service used by CCS using a standard interface	 Application Condition
		 SPP-15534 - TMS shall consider the CCS PRAMSS requirements when defining TMS PRAMSS requirements	 Application Condition
 SPT2OD-339 - Data acquisition			
 SPT2OD-340 - Remote upgrade			
 SPT2OD-341 - Driver Support Systems			
 SPT2OD-343 - Simplified asset configuration management	 SPP-9646 - Simplified asset configuration management	 SPP-6857 - CCS shall minimize the number of configuration parameters for Generic and Specific Applications	 Stakeholder Requirement
		 SPP-9513 - CCS shall be based on Generic Products that can be configured using openly available configuration parameters to address varying application needs	 Stakeholder Requirement
		 SPP-9644 - CCS shall acquire the static properties of the infrastructure (e.g. tracks with speed and gradient profiles) from a centralised service).	 Stakeholder Requirement
		 SPP-9645 - CCS shall acquire system configuration data from a centralised service via a standardised interface, based on EULYNX SMI-xx.	 Stakeholder Requirement
		 SPP-9647 - CCS shall acquire the static properties of the trains (e.g. loading gauge) from a centralised service.	 Stakeholder Requirement
		 SPP-14825 - TMS shall acquire system configuration data for infrastructure and vehicle systems from the same centralised service used by CCS using a standard interface	 Application Condition
		 SPP-16201 - TMS shall minimize the number of configuration parameters for Generic and Specific Applications	 Application Condition
 SPT2OD-345 - Standard diagnostic features	 SPP-9683 - Standard diagnostic features	 SPP-9679 - CCS shall implement standardised diagnostics functions and standardised interfaces for faster root cause analysis, recovery processes, failure prediction and prevention.	 Stakeholder Requirement
		 SPP-9680 - CCS shall provide diagnostic information based on the generic part of the EULYNX/ EU-Rail System Pillar standardised diagnostic interface, called SDI-xx.	 Stakeholder Requirement
		 SPP-9681 - An harmonized process shall be defined to report, store and distribute diagnosis information to/from a centralised system.	 Operational Requirement
		 SPP-14826 - TMS shall use the same centralized diagnostic service used by CCS using a standard interface	 Application Condition

Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
 SPT2OD-346 - Sharing of diagnostic information	 SPP-9684 - Sharing of diagnostic information	 SPP-6941 - CCS shall perform periodical self-tests and self-diagnostics of its vital functions	 Stakeholder Requirement
		 SPP-9679 - CCS shall implement standardised diagnostics functions and standardised interfaces for faster root cause analysis, recovery processes, failure prediction and prevention.	 Stakeholder Requirement
		 SPP-9681 - An harmonized process shall be defined to report, store and distribute diagnosis information to/from a centralised system.	 Operational Requirement
		 SPP-14826 - TMS shall use the same centralized diagnostic service used by CCS using a standard interface	 Application Condition
 SPT2OD-348 - Enhanced Security Management			
 SPT2OD-349 - Security by Design	 SPP-9903 - Security by Design	 SPP-9296 - CCS shall enable updates of Configuration Data on runtime	 Stakeholder Requirement
		 SPP-9904 - CCS shall support the tool chain provided by centralised services e.g. regarding diagnostics, configuration management, topology update	 Stakeholder Requirement
		 SPP-9905 - CCS system shall be developed using a security-by-design process, in order to avoid attacks to hardware or software components	 Stakeholder Requirement
		 SPP-9906 - CCS system shall be protected by managing access in centralised access and identification Systems	 Stakeholder Requirement
		 SPP-14106 - CCS shall interface to centralised security services	 Stakeholder Requirement
		 SPP-16199 - TMS shall be developed using a security-by-design process	 Application Condition
		 SPP-16200 - TMS shall use a centralised access management and identification system	 Application Condition
 SPT2OD-351 - Enhanced Safety Assurance Process			
 SPT2OD-352 - Modular Safety	 SPP-9868 - Modular Safety	 SPP-8866 - Implement standardised interfaces without hindering of innovation	 Stakeholder Requirement
		 SPP-9554 - CCS shall follow a generic safety approach in encapsulating safety relevant functions within building blocks with a separate safety approvals	 Stakeholder Requirement
		 SPP-9620 - CCS shall avoid as much as possible exported Safety-Related Application Conditions	 Stakeholder Requirement
		 SPP-9870 - CCS shall follow modular design principles	 Stakeholder Requirement
		 SPP-9894 - CCS shall implement an architecture based on standardised interfaces to facilitate independent safety cases and approval processes for each subsystem	 Stakeholder Requirement

Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-9901 - CCS shall be designed in such a way that specified components can be replaced and interconnected without the need to re-approve other components	 Stakeholder Requirement
		 SPP-10253 - Allow configuration of Generic Application according to local needs within predefined limits	 Stakeholder Requirement
		 SPP-10254 - Enable implementation of Generic Products with Safety Cases independent of Configuration Data	 Stakeholder Requirement
		 SPP-10255 - Enable implementation of Generic Applications with Safety Cases independent of Configuration Data	 Stakeholder Requirement
		 SPP-14827 - TMS shall support changes of system configuration of internal and external components during running time	 Application Condition
		 SPP-15535 - TMS shall comply with the ARC-D2.3 Granularity Concepts and Principles for designing TMS architecture	 Application Condition
 SPT2OD-353 - Risk assessment quality	 SPP-9619 - Risk assessment quality	 SPP-9554 - CCS shall follow a generic safety approach in encapsulating safety relevant functions within building blocks with a separate safety approvals	 Stakeholder Requirement
		 SPP-9620 - CCS shall avoid as much as possible exported Safety-Related Application Conditions	 Stakeholder Requirement
		 SPP-14326 - CCS shall use reference models, reference laboratories and automated compliance testing in accordance with the European approval procedure (CENELEC phases 6 to 9)	 Stakeholder Requirement
		 SPP-15534 - TMS shall consider the CCS PRAMSS requirements when defining TMS PRAMSS requirements	 Application Condition
 SPT2OD-354 - Dynamic change of system configurations	 SPP-9661 - Dynamic change of system configurations	 SPP-6882 - CCS shall support advisory systems	 Stakeholder Requirement
		 SPP-8624 - An harmonised process shall be defined to systems configuration during rail operation	 Operational Requirement
		 SPP-8625 - An harmonized process shall be defined to run diagnose test of a component during running time	 Operational Requirement
		 SPP-8626 - CCS shall support diagnose test of a component during running time.	 Stakeholder Requirement
		 SPP-8650 - An harmonized process shall be defined to mitigation measures to react in case of an incident	 Operational Requirement
		 SPP-9296 - CCS shall enable updates of Configuration Data on runtime	 Stakeholder Requirement
		 SPP-9660 - CCS shall disclose incompatibilities between its subsystems and their interfaces during runtime.	 Stakeholder Requirement

Operational Vision (Railway Requirements)	Operational Vision Breakdown	Operational Vision Breakdown Result	Type
		 SPP-10253 - Allow configuration of Generic Application according to local needs within predefined limits	 Stakeholder Requirement
		 SPP-14826 - TMS shall use the same centralized diagnostic service used by CCS using a standard interface	 Application Condition
		 SPP-14827 - TMS shall support changes of system configuration of internal and external components during running time	 Application Condition
		 SPP-14828 - TMS shall support diagnose test of a component during running time	 Application Condition

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