




ERJU SYSTEM PILLAR

# **Transversal CCS - System definition - SL4 - Risk Analysis**



# Transversal CCS - System definition - SL4 - Risk Analysis

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Abstract	FMEA for Transversal CCS based on System Definition (System Level 4)
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## 1 Preamble



### 1.1 Methodology

- The risk analysis is done by a FMEA (Failure modes and effect analysis) to identify safety relevance of the CCS System and to define mitigation measures to mitigate hazards.
  - There are three general failure modes (commission, omission, incorrect) analysed per exchange.
  - The effects are split into describing the immediate effect on the linked function and the effect on the railway system as a whole.
- The analysis of the output exchanges of the physical environment, external systems and human actors to the CCS System is structured by the corresponding System Actors.
- The link to the Risk Sheet of this analysis can be used to see the full FMEA: FMEA - Transversal CCS - SL4 (<https://polarion.rail-research.europa.eu/polarion/#/project/SPRM/risksheet?document=02%20TCCS%20Working%20documents%2FTransversal%20CCS%20-%20System%20definition%20-%20SL4%20-%20Risk%20Analysis>).
- This document contains all the exchanges that are analysed in a FMEA (see Risk Sheet link above) and a summary of the most important risk analysis results (Failures, effects, hazards, mitigations, etc.).


### 1.2 Scope and intended audience

The scope of this FMEA is the inputs and outputs of the Transversal CCS system, as defined in the  TCCS System Definition ([https://polarion.rail-research.europa.eu/polarion/#/project/SPT2TS/wiki/System%20Level%204/TCCS\\_System\\_Definition](https://polarion.rail-research.europa.eu/polarion/#/project/SPT2TS/wiki/System%20Level%204/TCCS_System_Definition)). The inputs are taken into account and will be updated with outputs from other domains, such as Traffic CS and Train CS. This analysis is meant to be reviewed from all domains designing functions with inputs and/or outputs to Transversal CCS System.

The two main functions allocated to the Transversal CCS System are :

-  SPMS-2834 - Maintain configuration data: simplified as "**TCCS Configuration**" here
-  SPMS-4502 - Monitor+Evaluate system asset state: simplified as "**TCCS Diagnostics**" here






The Transversal CCS System also needs to synchronise time with a time reference to perform its functions, hence another function is allocated:

-  SPMS-2922 - Synchronise current time: simplified as "**TCCS time synchronisation**" here






## 2 Detailed Failure Modes and Effects Analysis

**Output of TCCS Diagnostics to Asset Management System: system asset state evaluation sent too early**

ID	SPRM-1596
Failure Mode (Keyword)	Commission
Failure Description	System asset state is given too early or at a wrong time.
Effect on Linked Functions Systems	No effect, as long as the diagnosis is correct at the time it is sent (see incorrect failure mode if not).
Effect on Railway System	No effect.
Risk Comment	All safety-related components should fail safely. Further constraints to be defined.






Linked Work Items	relates to :  SPMS-5445 relates to :  SPMS-4502 - Monitor+Evaluate system asset state relates to :  SPMS-4507 - Evaluated system asset state relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis
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#### Output of TCCS Diagnostics to Asset Management System: system asset state evaluation sent too late





ID	SPRM-1597
Failure Mode (Keyword)	Omission
Failure Description	System asset state is given too late or not at all.
Effect on Linked Functions Systems	The target might not be aware of a potential dangerous behaviour of the system.  Restrictions and/or maintenance might be issued too late, resulting in failure due to the target system staying in operation with a dangerous behaviour.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-5445 relates to :  SPMS-4502 - Monitor+Evaluate system asset state relates to :  SPMS-4507 - Evaluated system asset state relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Output of TCCS Diagnostics to Asset Management System: wrong system asset state evaluation sent





ID	SPRM-1598
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong system asset state is given.
Effect on Linked Functions Systems	A wrong diagnosis might affect the target system maintenance and/or restrictions.  If the diagnosis is worse than the correct one, a wrong restriction might be imposed and/or earlier maintenance operation might be planned. If the diagnosis is better than the correct one, the target system might continue to operate with a dangerous behaviour.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely.  Further constraints to be defined.

Linked Work Items	relates to :  SPMS-5445 relates to :  SPMS-4502 - Monitor+Evaluate system asset state relates to :  SPMS-4507 - Evaluated system asset state relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis
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#### Output of TCCS Diagnostics to Signaller: system asset state evaluation sent too early

ID	SPRM-1602
Failure Mode (Keyword)	Commission
Failure Description	System asset state is given too early or at a wrong time.
Effect on Linked Functions Systems	No effect, as long as the diagnosis is correct at the time it is sent (see incorrect failure mode if not).
Effect on Railway System	No effect.
Risk Comment	All safety-related components should fail safely.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-4502 - Monitor+Evaluate system asset state relates to :  SPMS-6556 - Evaluated system asset state relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis





#### Output of TCCS Diagnostics to Signaller: system asset state evaluation sent too late

ID	SPRM-1603
Failure Mode (Keyword)	Omission
Failure Description	System asset state is given too late or not at all.
Effect on Linked Functions Systems	The target might not be aware of a potential dangerous behaviour of the system.  Restrictions and/or maintenance might be issued too late, resulting in failure due to the target system staying in operation with a dangerous behaviour.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-4502 - Monitor+Evaluate system asset state relates to :  SPMS-6556 - Evaluated system asset state relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Output of TCCS Diagnostics to Signaller: wrong system asset state evaluation sent





ID	SPRM-1604
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong system asset state is given.
Effect on Linked Functions Systems	<p>A wrong diagnosis might affect the target system maintenance and/or restrictions.</p> <p>If the diagnosis is worse than the correct one, a wrong restriction might be imposed and/or earlier maintenance operation might be planned.</p> <p>If the diagnosis is better than the correct one, the target system might continue to operate with a dangerous behaviour.</p>
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	<p>All safety-related components should fail safely.</p> <p>Further constraints to be defined.</p>
Linked Work Items	<p>relates to :  SPMS-4502 - Monitor+Evaluate system asset state</p> <p>relates to :  SPMS-6556 - Evaluated system asset state</p> <p>relates to :  SPMS-6663 - Perform system asset diagnosis</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

#### Output of TCCS Diagnostics to Infrastructure Manager: system asset state evaluation sent too early





ID	SPRM-1608
Failure Mode (Keyword)	Commission
Failure Description	System asset state is given too early or at a wrong time.
Effect on Linked Functions Systems	No effect, as long as the diagnosis is correct at the time it is sent (see incorrect failure mode if not).
Effect on Railway System	No effect.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-4502 - Monitor+Evaluate system asset state</p> <p>relates to :  SPMS-6558 - Evaluated system asset state</p> <p>relates to :  SPMS-6663 - Perform system asset diagnosis</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

#### Output of TCCS Diagnostics to Infrastructure Manager: system asset state evaluation sent too late

ID	SPRM-1609
Failure Mode (Keyword)	Omission
Failure Description	System asset state is given too late or not at all.





Effect on Linked Functions Systems	The target might not be aware of a potential dangerous behaviour of the system. Restrictions and/or maintenance might be issued too late, resulting in failure due to the target system staying in operation with a dangerous behaviour.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely. Availability requirements : to be defined.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-4502 - Monitor+Evaluate system asset state relates to :  SPMS-6558 - Evaluated system asset state relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Output of TCCS Diagnostics to Infrastructure Manager: wrong system asset state evaluation sent





ID	SPRM-1610
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong system asset state is given.
Effect on Linked Functions Systems	A wrong diagnosis might affect the target system maintenance and/or restrictions.  If the diagnosis is worse than the correct one, a wrong restriction might be imposed and/or earlier maintenance operation might be planned. If the diagnosis is better than the correct one, the target system might continue to operate with a dangerous behaviour.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely. Availability requirements : to be defined.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-4502 - Monitor+Evaluate system asset state relates to :  SPMS-6558 - Evaluated system asset state relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Output of TCCS Diagnostics to Railway Undertaking: system asset state evaluation sent too early

ID	SPRM-1611
Failure Mode (Keyword)	Commission
Failure Description	System asset state is given too early or at a wrong time.

Effect on Linked Functions Systems	No effect, as long as the diagnosis is correct at the time it is sent (see incorrect failure mode if not).
Effect on Railway System	No effect.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-4502 - Monitor+Evaluate system asset state</p> <p>relates to :  SPMS-6559 - Evaluated system asset state</p> <p>relates to :  SPMS-6663 - Perform system asset diagnosis</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>





#### Output of TCCS Diagnostics to Railway Undertaking: system asset state evaluation sent too late

ID	SPRM-1612
Failure Mode (Keyword)	Omission
Failure Description	System asset state is given too late or not at all.
Effect on Linked Functions Systems	<p>The target might not be aware of a potential dangerous behaviour of the system.</p> <p>Restrictions and/or maintenance might be issued too late, resulting in failure due to the target system staying in operation with a dangerous behaviour.</p>
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	<p>All safety-related components should fail safely.</p> <p>Availability requirements : to be defined.</p> <p>Further constraints to be defined.</p>
Linked Work Items	<p>relates to :  SPMS-4502 - Monitor+Evaluate system asset state</p> <p>relates to :  SPMS-6559 - Evaluated system asset state</p> <p>relates to :  SPMS-6663 - Perform system asset diagnosis</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>





#### Output of TCCS Diagnostics to Railway Undertaking: wrong system asset state evaluation sent

ID	SPRM-1613
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong system asset state is given.
Effect on Linked Functions Systems	<p>A wrong diagnosis might affect the BuildingBlock maintenance and/or restrictions.</p> <p>If the diagnosis is worse than the correct one, a wrong restriction might be imposed and/or earlier maintenance operation might be planned.</p> <p>If the diagnosis is better than the correct one, the target system might continue to operate with a dangerous behaviour.</p>







Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely. Availability requirements : to be defined.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-4502 - Monitor+Evaluate system asset state relates to :  SPMS-6559 - Evaluated system asset state relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Output of TCCS Diagnostics to Field Force (maintainer): system asset state evaluation sent too early





ID	SPRM-1614
Failure Mode (Keyword)	Commission
Failure Description	System asset state is given too early or at a wrong time.
Effect on Linked Functions Systems	No effect, as long as the diagnosis is correct at the time it is sent (see incorrect failure mode if not).
Effect on Railway System	No effect.
Risk Comment	All safety-related components should fail safely.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-4502 - Monitor+Evaluate system asset state relates to :  SPMS-6560 - Evaluated system asset state relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Output of TCCS Diagnostics to Field Force (maintainer): system asset state evaluation sent too late

ID	SPRM-1615
Failure Mode (Keyword)	Omission
Failure Description	System asset state is given too late or not at all.
Effect on Linked Functions Systems	The target might not be aware of a potential dangerous behaviour of the system.  Restrictions and/or maintenance might be issued too late, resulting in failure due to the target system staying in operation with a dangerous behaviour.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.





Risk Comment	All safety-related components should fail safely. Availability requirements : to be defined.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-4502 - Monitor+Evaluate system asset state relates to :  SPMS-6560 - Evaluated system asset state relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Output of TCCS Diagnostics to Field Force (maintainer): wrong system asset state evaluation sent





ID	SPRM-1616
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong system asset state is given.
Effect on Linked Functions Systems	A wrong diagnosis might affect the BuildingBlock maintenance and/or restrictions.  If the diagnosis is worse than the correct one, a wrong restriction might be imposed and/or earlier maintenance operation might be planned.  If the diagnosis is better than the correct one, the target system might continue to operate with a dangerous behaviour.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely. Availability requirements : to be defined.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-4502 - Monitor+Evaluate system asset state relates to :  SPMS-6560 - Evaluated system asset state relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input to TCCS Diagnostics: Time reference received too early





ID	SPRM-1617
Failure Mode (Keyword)	Commission
Failure Description	Time reference is given too early or at a wrong time.
Effect on Linked Functions Systems	No effect.
Effect on Railway System	No effect.
Risk Comment	Further constraints to be defined.

Linked Work Items	relates to :  SPMS-6269 - Provide current time relates to :  SPMS-4506 - Provided current time relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis
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#### Input from Traffic CS System to TCCS Diagnostics: monitoring and diagnostic data received too early

ID	SPRM-1618
Failure Mode (Keyword)	Commission
Failure Description	Monitoring/diagnostic data is given too early or at a wrong time.
Effect on Linked Functions Systems	No effect, as long as the state given corresponds to the current time (see incorrect failure mode if not).
Effect on Railway System	No effect.
Risk Comment	Further constraints to be defined.
Linked Work Items	relates to :  SPMS-2895 - Monitor+Store Traffic CS System asset state relates to :  SPMS-3062 - Monitoring and diagnostic data relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis





#### Input from Asset Management System to TCCS Diagnostics: logistic data received too early

ID	SPRM-1619
Failure Mode (Keyword)	Commission
Failure Description	Logistic data is given too early or at a wrong time.
Effect on Linked Functions Systems	Logistic data from an earlier state than expected is used to evaluate the next maintenance step. Wrong maintenance tasks are considered, leading to a false interpretation of the target system's current state.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely. Further constraints to be defined.
Linked Work Items	relates to :  SPMS-4503 - Plan maintenance tasks+Manage asset relates to :  SPMS-6555 - Logistic data relates to :  SPMS-6979 - Perform system asset diagnosis (logistic data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input from Trackside Assets CS System to TCCS Diagnostics: monitoring and diagnostic data received too early





ID	SPRM-1620
Failure Mode (Keyword)	Commission
Failure Description	Monitoring/diagnostic data is given too early or at a wrong time.
Effect on Linked Functions Systems	No effect, as long as the state given corresponds to the current time (see incorrect failure mode if not).
Effect on Railway System	No effect.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-6533 - Monitor+Store Trackside Assets CS System asset state</p> <p>relates to :  SPMS-6561 - Monitoring and diagnostic data</p> <p>relates to :  SPMS-6663 - Perform system asset diagnosis</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

#### Input from Train CS System to TCCS Diagnostics: monitoring and diagnostic data received too early





ID	SPRM-1621
Failure Mode (Keyword)	Commission
Failure Description	Monitoring/diagnostic data is given too early or at a wrong time.
Effect on Linked Functions Systems	No effect, as long as the state given corresponds to the current time (see incorrect failure mode if not).
Effect on Railway System	No effect.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-6884 - Monitor+Store Train CS System asset state</p> <p>relates to :  SPMS-6909 - Monitoring and diagnostic data</p> <p>relates to :  SPMS-6663 - Perform system asset diagnosis</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

#### Input from Traffic CS System to TCCS Diagnostics: monitoring and diagnostic data received too late

ID	SPRM-1622
Failure Mode (Keyword)	Omission
Failure Description	Monitoring/diagnostic data is given too late or not at all.
Effect on Linked Functions Systems	A late diagnosis is emitted. A potential dangerous behaviour is not detected. Restrictions and/or maintenance might be issued too late, resulting in failure due to the target system staying in operation with a dangerous behaviour.





Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely. Availability requirements : to be defined.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-2895 - Monitor+Store Traffic CS System asset state relates to :  SPMS-3062 - Monitoring and diagnostic data relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input from Traffic CS System to TCCS Diagnostics: wrong monitoring and diagnostic data received





ID	SPRM-1623
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong monitoring/diagnostic data is given.
Effect on Linked Functions Systems	A diagnosis is emitted based on wrong data.  If the diagnosis is worse than the correct one, a wrong restriction might be imposed and/or earlier maintenance operation might be planned. If the diagnosis is better than the correct one, the target system might continue to operate with a dangerous behaviour.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely. Availability requirements : to be defined.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-2895 - Monitor+Store Traffic CS System asset state relates to :  SPMS-3062 - Monitoring and diagnostic data relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input to TCCS Diagnostics: Time reference received too late





ID	SPRM-1624
Failure Mode (Keyword)	Omission
Failure Description	Time reference is given too late or not at all.
Effect on Linked Functions Systems	Late or no execution of the targeted function as it takes the time variable into account.
Effect on Railway System	Unavailability of an area or a train.
Risk Comment	Further constraints to be defined.

Linked Work Items	relates to :  SPMS-6269 - Provide current time relates to :  SPMS-4506 - Provided current time relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis
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#### Input to TCCS Diagnostics: wrong Time reference received

ID	SPRM-1625
Failure Mode (Keyword)	Incorrect
Failure Description	Incorrect time reference is given.
Effect on Linked Functions Systems	Result in commission/omission failure modes for targeted functions.
Effect on Railway System	Result in commission/omission failure modes for targeted functions.
Risk Comment	Further constraints to be defined.
Linked Work Items	relates to :  SPMS-6269 - Provide current time relates to :  SPMS-4506 - Provided current time relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis





#### Input from Trackside Assets CS System to TCCS Diagnostics: monitoring and diagnostic data received too late

ID	SPRM-1626
Failure Mode (Keyword)	Omission
Failure Description	Monitoring/diagnostic data is given too late or not at all.
Effect on Linked Functions Systems	A late diagnosis is emitted. A potential dangerous behaviour is not detected. Restrictions and/or maintenance might be issued too late, resulting in failure due to the target system staying in operation with a dangerous behaviour.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely. Further constraints to be defined.
Linked Work Items	relates to :  SPMS-6533 - Monitor+Store Trackside Assets CS System asset state relates to :  SPMS-6561 - Monitoring and diagnostic data relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input from Trackside Assets CS System to TCCS Diagnostics: wrong monitoring and diagnostic data received





ID	SPRM-1627
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong monitoring/diagnostic data is given.
Effect on Linked Functions Systems	A diagnosis is emitted based on wrong observations.  If the diagnosis is worse than the correct one, a wrong restriction might be imposed and/or earlier maintenance operation might be planned. If the diagnosis is better than the correct one, the target system might continue to operate with a dangerous behaviour.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-6533 - Monitor+Store Trackside Assets CS System asset state relates to :  SPMS-6561 - Monitoring and diagnostic data relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input from Train CS System to TCCS Diagnostics: monitoring and diagnostic data received too late






ID	SPRM-1628
Failure Mode (Keyword)	Omission
Failure Description	Monitoring/diagnostic data is given too late or not at all.
Effect on Linked Functions Systems	A late diagnosis is emitted. A potential dangerous behaviour is not detected. Restrictions and/or maintenance might be issued too late, resulting in failure due to the target system staying in operation with a dangerous behaviour.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	Availability requirements : to be defined.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-6884 - Monitor+Store Train CS System asset state relates to :  SPMS-6909 - Monitoring and diagnostic data relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input from Train CS System to TCCS Diagnostics: wrong monitoring and diagnostic data received

ID	SPRM-1629
Failure Mode (Keyword)	Incorrect

Failure Description	Wrong monitoring/diagnostic data is given.
Effect on Linked Functions Systems	A diagnosis is emitted based on wrong observations.  If the diagnosis is worse than the correct one, a wrong restriction might be imposed and/or earlier maintenance operation might be planned. If the diagnosis is better than the correct one, the target system might continue to operate with a dangerous behaviour.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	Availability requirements : to be defined.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-6884 - Monitor+Store Train CS System asset state relates to :  SPMS-6909 - Monitoring and diagnostic data relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis






#### Output of TCCS Configuration to Traffic CS System: configuration data sent too early

ID	SPRM-1630
Failure Mode (Keyword)	Commission
Failure Description	Configuration data is loaded too early or at a wrong time.
Effect on Linked Functions Systems	The target system gets configuration update earlier state than expected. It stays deactivated until the full top-level configuration is deployed.
Effect on Railway System	No safety issues.  Unavailability of an area or a train until the full top-level configuration is deployed.
Risk Comment	Development of tools/software shall be compliant to the EN50716 standard. Any safety issue identified in an obsolete version of the configuration is taken care of by applying restrictions on the SuC (lower speed/unavailability of area/ etc).  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-2834 - Maintain configuration data relates to :  SPMS-2993 - Actual state of configuration data relates to :  SPMS-6991 - Activate configuration data (Main) relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis






#### Output of TCCS Configuration to Trackside Assets CS System: configuration data sent too early

ID	SPRM-1631
Failure Mode (Keyword)	Commission








Failure Description	Configuration data is loaded too early or at a wrong time.
Effect on Linked Functions Systems	The target system gets configuration update earlier state than expected. It stays deactivated until the full top-level configuration is deployed.
Effect on Railway System	No safety issues. Unavailability of an area or a train until the full top-level configuration is deployed.
Risk Comment	Development of tools/software shall be compliant to the EN50716 standard. Any safety issue identified in an obsolete version of the configuration is taken care of by applying restrictions on the SuC (lower speed/unavailability of area/ etc).  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-2834 - Maintain configuration data relates to :  SPMS-6562 - Actual state of configuration data relates to :  SPMS-6991 - Activate configuration data (Main) relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Output of TCCS Configuration to Configuration Manager: configuration data state sent too early






ID	SPRM-1632
Failure Mode (Keyword)	Commission
Failure Description	Configuration data state is given too early or at a wrong time.
Effect on Linked Functions Systems	The wrong configuration state is considered even though an earlier phase is the sequence (preloading for example) hasn't been completed. The current phase might stop.
Effect on Railway System	Unavailability of an area or a train until the activation is authorized.
Risk Comment	Development of tools/software shall be compliant to the EN50716 standard.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-2834 - Maintain configuration data relates to :  SPMS-6901 - Actual state of configuration data relates to :  SPMS-6991 - Activate configuration data (Main) relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Output of TCCS Configuration to Signaller: configuration data state sent too early

ID	SPRM-1633
Failure Mode (Keyword)	Commission
Failure Description	Configuration data state is given too early or at a wrong time.






Effect on Linked Functions Systems	The wrong configuration state is considered even though an earlier phase is the sequence (preloading for example) hasn't been completed. The current phase might stop.
Effect on Railway System	Unavailability of an area or a train until the activation is authorized.
Risk Comment	Development of tools/software shall be compliant to the EN50716 standard. Further constraints to be defined.
Linked Work Items	relates to :  SPMS-2834 - Maintain configuration data relates to :  SPMS-6902 - Actual state of configuration data relates to :  SPMS-6991 - Activate configuration data (Main) relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Output of TCCS Configuration to Traffic Management System: configuration data state sent too early

ID	SPRM-1634
Failure Mode (Keyword)	Commission
Failure Description	Configuration data state is given too early or at a wrong time.
Effect on Linked Functions Systems	The wrong configuration state is considered even though an earlier phase is the sequence (preloading for example) hasn't been completed. The current phase might stop.
Effect on Railway System	Unavailability of an area or a train until the activation is authorized.
Risk Comment	Development of tools/software shall be compliant to the EN50716 standard. Further constraints to be defined.
Linked Work Items	relates to :  SPMS-2834 - Maintain configuration data relates to :  SPMS-6900 - Actual state of configuration data relates to :  SPMS-6991 - Activate configuration data (Main) relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis





















#### Output of TCCS Configuration to Traffic CS System: configuration data sent too late

ID	SPRM-1635
Failure Mode (Keyword)	Omission
Failure Description	Configuration data is loaded too late or not sent at all.
Effect on Linked Functions Systems	The configuration data is not available.  The target system might continue to operate with an older version that contains safety relevant issues. It might need to be set out of operation.






Effect on Railway System	No safety issues. Unavailability of an area or a train until the full top-level configuration is deployed.
Risk Comment	Development of tools/software shall be compliant to the EN50716 standard. Any safety issue identified in an obsolete version of the configuration is taken care of by applying restrictions on the SuC (lower speed/unavailability of area/ etc).  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-2834 - Maintain configuration data relates to :  SPMS-2993 - Actual state of configuration data relates to :  SPMS-6991 - Activate configuration data (Main) relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Output of TCCS Configuration to Traffic CS System: wrong configuration data sent

ID	SPRM-1636
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong configuration data is loaded or correct configuration data is altered during transfer.
Effect on Linked Functions Systems	The target system is updated with wrong configuration data. The wrong system is updated.
Effect on Railway System	A train might move with wrong speed restrictions/wrong movement authority/ wrong system activated/etc.
Risk Comment	Development of tools/software shall be compliant to the EN50716 standard.  Further constraints to be defined.









Linked Work Items	<p>relates to :  SPMS-2834 - Maintain configuration data</p> <p>relates to :  SPMS-2993 - Actual state of configuration data</p> <p>assesses :  SPRM-109 - [B.1.1] Failure to operate the infrastructure</p> <p>assesses :  SPRM-116 - [B.1.2] Failure to operate a train or rail vehicle</p> <p>assesses :  SPRM-130 - [B.1.0] Other un-coded operation failure</p> <p>assesses :  SPRM-274 - [B.2.2] Failure of the braking system</p> <p>assesses :  SPRM-277 - [B.2.0] Other failures of the rolling stock</p> <p>assesses :  SPRM-297 - [B.3.1.3] Wrong side signalling (infrastructure) failure</p> <p>assesses :  SPRM-298 - [B.3.1.4] Point and crossing failure</p> <p>assesses :  SPRM-300 - [B.3.1.5] Failure of the level crossing equipment</p> <p>assesses :  SPRM-301 - [B.3.1.0] Other failure of the track</p> <p>assesses :  SPRM-314 - [B.3.0.2] Train detection equipment failure (trackside)</p> <p>causes :  SPRM-71 - [A1] Collisions</p> <p>causes :  SPRM-77 - [A2] Derailments</p> <p>causes :  SPRM-81 - [A3] Level Crossing Accident</p> <p>causes :  SPRM-87 - [A4] Accidents to persons involving rolling stock in motion</p> <p>assesses :  SPRM-278 - [B.2.0.1] Wrong side signalling (on-board) failure</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>
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#### Output of TCCS Configuration to Trackside Assets CS System: configuration data sent too late

ID	SPRM-1637
Failure Mode (Keyword)	Omission
Failure Description	Configuration data is loaded too late or not sent at all.
Effect on Linked Functions Systems	<p>The configuration data is not available.</p> <p>The target system might continue to operate with an older version that contains safety relevant issues. It might need to be set out of operation.</p>
Effect on Railway System	<p>No safety issues.</p> <p>Unavailability of an area or a train until the full top-level configuration is deployed.</p>
Risk Comment	<p>Development of tools/software shall be compliant to the EN50716 standard. Any safety issue identified in an obsolete version of the configuration is taken care of by applying restrictions on the SuC (lower speed/unavailability of area/ etc).</p> <p>Further constraints to be defined.</p>
Linked Work Items	<p>relates to :  SPMS-2834 - Maintain configuration data</p> <p>relates to :  SPMS-6562 - Actual state of configuration data</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>






#### Output of TCCS Configuration to Trackside Assets CS System: wrong configuration data sent

ID	SPRM-1638
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Failure Mode (Keyword)	Incorrect
Failure Description	Wrong configuration data is loaded or correct configuration data is altered during transfer.
Effect on Linked Functions Systems	The target system is updated with wrong configuration data. The wrong system is updated.
Effect on Railway System	A train might move with wrong speed restrictions/wrong movement authority/ wrong system activated/etc.
Risk Comment	Development of tools/software shall be compliant to the EN50716 standard. Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-2834 - Maintain configuration data</p> <p>relates to :  SPMS-6562 - Actual state of configuration data</p> <p>assesses :  SPRM-109 - [B.1.1] Failure to operate the infrastructure</p> <p>assesses :  SPRM-116 - [B.1.2] Failure to operate a train or rail vehicle</p> <p>assesses :  SPRM-130 - [B.1.0] Other un-coded operation failure</p> <p>assesses :  SPRM-274 - [B.2.2] Failure of the braking system</p> <p>assesses :  SPRM-277 - [B.2.0] Other failures of the rolling stock</p> <p>assesses :  SPRM-297 - [B.3.1.3] Wrong side signalling (infrastructure) failure</p> <p>assesses :  SPRM-298 - [B.3.1.4] Point and crossing failure</p> <p>assesses :  SPRM-300 - [B.3.1.5] Failure of the level crossing equipment</p> <p>assesses :  SPRM-301 - [B.3.1.0] Other failure of the track</p> <p>assesses :  SPRM-314 - [B.3.0.2] Train detection equipment failure (trackside)</p> <p>causes :  SPRM-71 - [A1] Collisions</p> <p>causes :  SPRM-77 - [A2] Derailments</p> <p>causes :  SPRM-81 - [A3] Level Crossing Accident</p> <p>causes :  SPRM-87 - [A4] Accidents to persons involving rolling stock in motion</p> <p>assesses :  SPRM-278 - [B.2.0.1] Wrong side signalling (on-board) failure</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

#### Output of TCCS Configuration to Configuration Manager: configuration data state sent too late

ID	SPRM-1639
Failure Mode (Keyword)	Omission
Failure Description	Configuration data state is given too late or not at all.
Effect on Linked Functions Systems	The configuration state is not given, delayed the next phases in the sequence.
Effect on Railway System	Unavailability of an area or a train until the activation is authorized.
Risk Comment	Development of tools/software shall be compliant to the EN50716 standard. Further constraints to be defined.






Linked Work Items	relates to :  SPMS-2834 - Maintain configuration data relates to :  SPMS-6901 - Actual state of configuration data relates to :  SPMS-6991 - Activate configuration data (Main) relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis
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#### Output of TCCS Configuration to Configuration Manager: wrong configuration data state sent





















ID	SPRM-1640
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong configuration data state is given.
Effect on Linked Functions Systems	A wrong configuration state is considered by the target system : a component with errors might return a correct state.
Effect on Railway System	A train might move with wrong speed restrictions/wrong movement authority/wrong system activated/etc.
Risk Comment	Development of tools/software shall be compliant to the EN50716 standard.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-2834 - Maintain configuration data relates to :  SPMS-6901 - Actual state of configuration data assesses :  SPRM-109 - [B.1.1] Failure to operate the infrastructure assesses :  SPRM-116 - [B.1.2] Failure to operate a train or rail vehicle assesses :  SPRM-130 - [B.1.0] Other un-coded operation failure assesses :  SPRM-274 - [B.2.2] Failure of the braking system assesses :  SPRM-277 - [B.2.0] Other failures of the rolling stock assesses :  SPRM-297 - [B.3.1.3] Wrong side signalling (infrastructure) failure assesses :  SPRM-298 - [B.3.1.4] Point and crossing failure assesses :  SPRM-300 - [B.3.1.5] Failure of the level crossing equipment assesses :  SPRM-301 - [B.3.1.0] Other failure of the track assesses :  SPRM-314 - [B.3.0.2] Train detection equipment failure (trackside) causes :  SPRM-71 - [A1] Collisions causes :  SPRM-77 - [A2] Derailments causes :  SPRM-81 - [A3] Level Crossing Accident causes :  SPRM-87 - [A4] Accidents to persons involving rolling stock in motion assesses :  SPRM-278 - [B.2.0.1] Wrong side signalling (on-board) failure relates to :  SPMS-6991 - Activate configuration data (Main) relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Output of TCCS Configuration to Signaller: configuration data state sent too late

ID	SPRM-1641
Failure Mode (Keyword)	Omission
Failure Description	Configuration data state is given too late or not at all.






Effect on Linked Functions Systems	The configuration state is not given, delayed the next phases in the sequence.
Effect on Railway System	Unavailability of an area or a train until the activation is authorized.
Risk Comment	Development of tools/software shall be compliant to the EN50716 standard. Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-2834 - Maintain configuration data</p> <p>relates to :  SPMS-6902 - Actual state of configuration data</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

### Output of TCCS Configuration to Signaller: wrong configuration data state sent





ID	SPRM-1642
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong configuration data state is given.
Effect on Linked Functions Systems	A wrong configuration state is considered by the target system : a component with errors might return a correct state.
Effect on Railway System	A train might move with wrong speed restrictions/wrong movement authority/ wrong system activated/etc.
Risk Comment	Development of tools/software shall be compliant to the EN50716 standard. Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-2834 - Maintain configuration data</p> <p>relates to :  SPMS-6902 - Actual state of configuration data</p> <p>assesses :  SPRM-109 - [B.1.1] Failure to operate the infrastructure</p> <p>assesses :  SPRM-116 - [B.1.2] Failure to operate a train or rail vehicle</p> <p>assesses :  SPRM-130 - [B.1.0] Other un-coded operation failure</p> <p>assesses :  SPRM-274 - [B.2.2] Failure of the braking system</p> <p>assesses :  SPRM-277 - [B.2.0] Other failures of the rolling stock</p> <p>assesses :  SPRM-297 - [B.3.1.3] Wrong side signalling (infrastructure) failure</p> <p>assesses :  SPRM-298 - [B.3.1.4] Point and crossing failure</p> <p>assesses :  SPRM-300 - [B.3.1.5] Failure of the level crossing equipment</p> <p>assesses :  SPRM-301 - [B.3.1.0] Other failure of the track</p> <p>assesses :  SPRM-314 - [B.3.0.2] Train detection equipment failure (trackside)</p> <p>causes :  SPRM-71 - [A1] Collisions</p> <p>causes :  SPRM-77 - [A2] Derailments</p> <p>causes :  SPRM-81 - [A3] Level Crossing Accident</p> <p>causes :  SPRM-87 - [A4] Accidents to persons involving rolling stock in motion</p> <p>assesses :  SPRM-278 - [B.2.0.1] Wrong side signalling (on-board) failure</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>



### Output of TCCS Configuration to Traffic Management System: configuration data state sent too late

ID	SPRM-1643
Failure Mode (Keyword)	Omission
Failure Description	Configuration data state is given too late or not at all.
Effect on Linked Functions Systems	The configuration state is not given, delayed the next phases in the sequence.
Effect on Railway System	Unavailability of an area or a train until the activation is authorized.
Risk Comment	Development of tools/software shall be compliant to the EN50716 standard. Further constraints to be defined.
Linked Work Items	relates to :  SPMS-2834 - Maintain configuration data relates to :  SPMS-6900 - Actual state of configuration data relates to :  SPMS-6991 - Activate configuration data (Main) relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis





### Input from Traffic CS System to TCCS Diagnostics: monitoring and diagnostic data received too late

ID	SPRM-1644
Failure Mode (Keyword)	Omission
Failure Description	Monitoring/diagnostic data is given too late or not at all.
Effect on Linked Functions Systems	A late diagnosis is emitted. A potential dangerous behaviour is not detected. Restrictions and/or maintenance might be issued too late, resulting in failure due to the target system staying in operation with a dangerous behaviour.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely. Availability requirements : to be defined. Further constraints to be defined.
Linked Work Items	relates to :  SPMS-2895 - Monitor+Store Traffic CS System asset state relates to :  SPMS-3062 - Monitoring and diagnostic data relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

### Input from Traffic CS System to TCCS Diagnostics: wrong monitoring and diagnostic data received





















ID	SPRM-1645
Failure Mode (Keyword)	Incorrect







Failure Description	Wrong monitoring/diagnostic data is given.
Effect on Linked Functions Systems	A diagnosis is emitted based on wrong data. If the diagnosis is worse than the correct one, a wrong restriction might be imposed and/or earlier maintenance operation might be planned. If the diagnosis is better than the correct one, the target system might continue to operate with a dangerous behaviour.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely. Availability requirements : to be defined.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-2895 - Monitor+Store Traffic CS System asset state relates to :  SPMS-3062 - Monitoring and diagnostic data relates to :  SPMS-6663 - Perform system asset diagnosis has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Output of TCCS Configuration to Traffic Management System: wrong configuration data state sent

ID	SPRM-1646
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong configuration data state is given.
Effect on Linked Functions Systems	A wrong configuration state is considered by the target system : a component with errors might return a correct state.
Effect on Railway System	A train might move with wrong speed restrictions/wrong movement authority/ wrong system activated/etc.
Risk Comment	Development of tools/software shall be compliant to the EN50716 standard.  Further constraints to be defined.





Linked Work Items	<p>relates to :  SPMS-2834 - Maintain configuration data</p> <p>relates to :  SPMS-6900 - Actual state of configuration data</p> <p>assesses :  SPRM-109 - [B.1.1] Failure to operate the infrastructure</p> <p>assesses :  SPRM-116 - [B.1.2] Failure to operate a train or rail vehicle</p> <p>assesses :  SPRM-130 - [B.1.0] Other un-coded operation failure</p> <p>assesses :  SPRM-274 - [B.2.2] Failure of the braking system</p> <p>assesses :  SPRM-277 - [B.2.0] Other failures of the rolling stock</p> <p>assesses :  SPRM-297 - [B.3.1.3] Wrong side signalling (infrastructure) failure</p> <p>assesses :  SPRM-298 - [B.3.1.4] Point and crossing failure</p> <p>assesses :  SPRM-300 - [B.3.1.5] Failure of the level crossing equipment</p> <p>assesses :  SPRM-301 - [B.3.1.0] Other failure of the track</p> <p>assesses :  SPRM-314 - [B.3.0.2] Train detection equipment failure (trackside)</p> <p>causes :  SPRM-71 - [A1] Collisions</p> <p>causes :  SPRM-77 - [A2] Derailments</p> <p>causes :  SPRM-81 - [A3] Level Crossing Accident</p> <p>causes :  SPRM-87 - [A4] Accidents to persons involving rolling stock in motion</p> <p>assesses :  SPRM-278 - [B.2.0.1] Wrong side signalling (on-board) failure</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>
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#### Input from Traffic CS System to TCCS Configuration: configuration data state received too early




















ID	SPRM-1647
Failure Mode (Keyword)	Commission
Failure Description	State of configuration data is given too early or at a wrong time.
Effect on Linked Functions Systems	The activation state is considered even though an earlier phase is the sequence (preloading for example) hasn't been completed. The current phase might stop. The configuration data in itself might be corrupted, and the activation with the new configuration won't be authorized.
Effect on Railway System	Unavailability of an area or a train until the activation is authorized.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-2840 - Maintain Traffic CS System configuration data</p> <p>relates to :  SPMS-3211 - Activated state of configuration data</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

#### Input from Traffic CS System to TCCS Configuration: configuration data state received too late

ID	SPRM-1648
Failure Mode (Keyword)	Omission
Failure Description	State of configuration data is given too late or not at all.




Effect on Linked Functions Systems	The activation state is not given, delayed the next phases in the sequence. The target system awaits to be set in operation.
Effect on Railway System	Unavailability of an area or a train until the activation is authorized.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-2840 - Maintain Traffic CS System configuration data</p> <p>relates to :  SPMS-3211 - Activated state of configuration data</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

#### Input from Traffic CS System to TCCS Configuration: wrong configuration data state received




ID	SPRM-1649
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong state of configuration data is given.
Effect on Linked Functions Systems	A wrong activation state is considered for the current phase, leading to a wrong execution of the next phases. The target system might be set in operation with potential safety issues.
Effect on Railway System	A train might move with wrong speed restrictions/wrong movement authority/ wrong system activated/etc.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-2840 - Maintain Traffic CS System configuration data</p> <p>relates to :  SPMS-3211 - Activated state of configuration data</p> <p>assesses :  SPRM-109 - [B.1.1] Failure to operate the infrastructure</p> <p>assesses :  SPRM-116 - [B.1.2] Failure to operate a train or rail vehicle</p> <p>assesses :  SPRM-130 - [B.1.0] Other un-coded operation failure</p> <p>assesses :  SPRM-274 - [B.2.2] Failure of the braking system</p> <p>assesses :  SPRM-277 - [B.2.0] Other failures of the rolling stock</p> <p>assesses :  SPRM-297 - [B.3.1.3] Wrong side signalling (infrastructure) failure</p> <p>assesses :  SPRM-278 - [B.2.0.1] Wrong side signalling (on-board) failure</p> <p>assesses :  SPRM-298 - [B.3.1.4] Point and crossing failure</p> <p>assesses :  SPRM-300 - [B.3.1.5] Failure of the level crossing equipment</p> <p>assesses :  SPRM-301 - [B.3.1.0] Other failure of the track</p> <p>assesses :  SPRM-314 - [B.3.0.2] Train detection equipment failure (trackside)</p> <p>causes :  SPRM-71 - [A1] Collisions</p> <p>causes :  SPRM-77 - [A2] Derailments</p> <p>causes :  SPRM-81 - [A3] Level Crossing Accident</p> <p>causes :  SPRM-87 - [A4] Accidents to persons involving rolling stock in motion</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

#### Input to TCCS time synchronisation: Time Reference sent too early

ID	SPRM-1650
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Failure Mode (Keyword)	Commission
Failure Description	Time reference is given too early or at a wrong time.
Effect on Linked Functions Systems	No effect.
Effect on Railway System	No effect.
Risk Comment	Further constraints to be defined.
Linked Work Items	relates to :  SPMS-6269 - Provide current time relates to :  SPMS-6271 - Provide current time has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input to TCCS time synchronisation: Time Reference sent too late






ID	SPRM-1651
Failure Mode (Keyword)	Omission
Failure Description	Time reference is given too late or not at all.
Effect on Linked Functions Systems	Late or no execution of the targeted function as it takes the time variable into account.
Effect on Railway System	Unavailability of an area or a train.
Risk Comment	Further constraints to be defined.
Linked Work Items	relates to :  SPMS-6269 - Provide current time relates to :  SPMS-6271 - Provide current time has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input to TCCS time synchronisation: wrong Time Reference received






ID	SPRM-1652
Failure Mode (Keyword)	Incorrect
Failure Description	Incorrect time reference is given.
Effect on Linked Functions Systems	Result in commission/omission failure modes for targeted functions.
Effect on Railway System	Result in commission/omission failure modes for targeted functions.
Risk Comment	Further constraints to be defined.

Linked Work Items	relates to :  SPMS-6269 - Provide current time relates to :  SPMS-6271 - Provide current time has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis
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#### Input to TCCS Configuration: Time Reference sent too early






ID	SPRM-1653
Failure Mode (Keyword)	Commission
Failure Description	Time reference is given too early or at a wrong time.
Effect on Linked Functions Systems	No effect.
Effect on Railway System	No effect.
Risk Comment	Further constraints to be defined.
Linked Work Items	relates to :  SPMS-6269 - Provide current time relates to :  SPMS-5412 - Provided current time relates to :  SPMS-6991 - Activate configuration data (Main) relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input to TCCS Configuration: Time Reference sent too late






ID	SPRM-1654
Failure Mode (Keyword)	Omission
Failure Description	Time reference is given too late or not at all.
Effect on Linked Functions Systems	Late or no execution of the targeted function as it takes the time variable into account.
Effect on Railway System	Unavailability of an area or a train.
Risk Comment	Further constraints to be defined.
Linked Work Items	relates to :  SPMS-6269 - Provide current time relates to :  SPMS-5412 - Provided current time relates to :  SPMS-6991 - Activate configuration data (Main) relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input to TCCS Configuration: wrong Time Reference received

ID	SPRM-1655
Failure Mode (Keyword)	Incorrect





Failure Description	Incorrect time reference is given.
Effect on Linked Functions Systems	Result in commission/omission failure modes for targeted functions.
Effect on Railway System	Result in commission/omission failure modes for targeted functions.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-6269 - Provide current time</p> <p>relates to :  SPMS-5412 - Provided current time</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

#### Input from Configuration Manager to TCCS Configuration: configuration data state received too early





ID	SPRM-1656
Failure Mode (Keyword)	Commission
Failure Description	Configuration data state (parameters) is sent too early or at a wrong time.
Effect on Linked Functions Systems	<p>The requested configuration data state is received before the current phase is finished.</p> <p>The TransversalCCS system might start the update even though the configuration data isn't available. The full configuration won't be deployed.</p> <p>The target system might continue to operate with an older version that contains safety relevant issues. It might need to be set out of operation.</p>
Effect on Railway System	Unavailability of an area or train due to restrictions imposed by the IM/RU following the detection of safety issues.
Risk Comment	<p>Any safety issue identified in an obsolete version of the configuration is taken care of by applying restrictions on the SuC (lower speed/unavailability of area/ etc).</p> <p>Further constraints to be defined.</p>
Linked Work Items	<p>relates to :  SPMS-5400 - Prepare+Supervise distribution of the configuration data</p> <p>relates to :  SPMS-5413 - Required state of configuration data</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

#### Input from Asset Management System to TCCS Diagnostics: logistic data received too late

ID	SPRM-1657
Failure Mode (Keyword)	Omission
Failure Description	Logistic data is given too late or not at all.






Effect on Linked Functions Systems	The target is waiting for the logistic data to be sent. The system might consider an earlier state. Wrong maintenance tasks are considered, leading to a false interpretation of the target system's current state.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-4503 - Plan maintenance tasks+Manage asset relates to :  SPMS-6555 - Logistic data relates to :  SPMS-6979 - Perform system asset diagnosis (logistic data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input from Asset Management System to TCCS Diagnostics: wrong logistic data received

ID	SPRM-1658
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong logistic data is given.
Effect on Linked Functions Systems	Wrong maintenance tasks are considered, leading to a false interpretation of the target system's current state.
Effect on Railway System	Unavailability of an area or train due to an unexpected failure or a wrong restriction of a system with wrong diagnosis.
Risk Comment	All safety-related components should fail safely.  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-4503 - Plan maintenance tasks+Manage asset relates to :  SPMS-6555 - Logistic data relates to :  SPMS-6979 - Perform system asset diagnosis (logistic data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input from Configuration Manager to TCCS Configuration: configuration data state received too late













ID	SPRM-1659
Failure Mode (Keyword)	Omission
Failure Description	Configuration data state (parameters) is sent too late or not at all.
Effect on Linked Functions Systems	The request state is awaited by the TransversalCCS system which delays the next phases.  The target system might continue to operate with an older version that contains safety relevant issues. The system might stay stuck in a state where it is unavailable.

Effect on Railway System	Unavailability of an area or train due to restrictions imposed by the IM/RU following the detection of safety issues.
Risk Comment	<p>Any safety issue identified in an obsolete version of the configuration is taken care of by applying restrictions on the SuC (lower speed/unavailability of area/ etc).</p> <p>Further constraints to be defined.</p>
Linked Work Items	<p>relates to :  SPMS-5400 - Prepare+Supervise distribution of the configuration data</p> <p>relates to :  SPMS-5413 - Required state of configuration data</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

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


### Input from Configuration Manager to TCCS Configuration: wrong configuration data state received





ID	SPRM-1660
Failure Mode (Keyword)	Incorrect
Failure Description	Configuration data is sent with wrong state (parameters).
Effect on Linked Functions Systems	The configuration data parameters are wrong, leading to the wrong configuration data being deployed on the wrong system.
Effect on Railway System	A train might move with wrong speed restrictions/wrong movement authority/wrong system activated/etc.
Risk Comment	Development of tools/software shall be compliant to the EN50716 standard. Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-5400 - Prepare+Supervise distribution of the configuration data</p> <p>relates to :  SPMS-5413 - Required state of configuration data</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>assesses :  SPRM-109 - [B.1.1] Failure to operate the infrastructure</p> <p>assesses :  SPRM-116 - [B.1.2] Failure to operate a train or rail vehicle</p> <p>assesses :  SPRM-130 - [B.1.0] Other un-coded operation failure</p> <p>assesses :  SPRM-274 - [B.2.2] Failure of the braking system</p> <p>assesses :  SPRM-277 - [B.2.0] Other failures of the rolling stock</p> <p>assesses :  SPRM-278 - [B.2.0.1] Wrong side signalling (on-board) failure</p> <p>assesses :  SPRM-297 - [B.3.1.3] Wrong side signalling (infrastructure) failure</p> <p>assesses :  SPRM-298 - [B.3.1.4] Point and crossing failure</p> <p>assesses :  SPRM-300 - [B.3.1.5] Failure of the level crossing equipment</p> <p>assesses :  SPRM-301 - [B.3.1.0] Other failure of the track</p> <p>assesses :  SPRM-314 - [B.3.0.2] Train detection equipment failure (trackside)</p> <p>causes :  SPRM-71 - [A1] Collisions</p> <p>causes :  SPRM-77 - [A2] Derailments</p> <p>causes :  SPRM-81 - [A3] Level Crossing Accident</p> <p>causes :  SPRM-87 - [A4] Accidents to persons involving rolling stock in motion</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

### Input from Traffic Management System to TCCS Configuration: configuration data activation plan received too early





ID	SPRM-1661
Failure Mode (Keyword)	Commission
Failure Description	Activation plan is provided too early or at a wrong time.
Effect on Linked Functions Systems	An activation plan considering data from a earlier point in time is considered for activation/deactivation phases. The target system might be deactivated at a wrong time.
Effect on Railway System	Unavailability of an area or a train.

Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-5399 - Provide planned activation time</p> <p>relates to :  SPMS-5411 - Planned activation time</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>






#### Input from Traffic Management System to TCCS Configuration: configuration data activation plan received too late

ID	SPRM-1662
Failure Mode (Keyword)	Omission
Failure Description	Activation plan is provided too late or not at all.
Effect on Linked Functions Systems	The TransversalCCS system keeps the latest activation plan which is based on activation time not up to date. The target system might be deactivated for update at a wrong time.
Effect on Railway System	Unavailability of an area or a train.
Risk Comment	<p>Any safety issue identified in an obsolete version of the configuration is taken care of by applying restrictions on the SuC (lower speed/unavailability of area/ etc).</p> <p>Further constraints to be defined.</p>
Linked Work Items	<p>relates to :  SPMS-5399 - Provide planned activation time</p> <p>relates to :  SPMS-5411 - Planned activation time</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>






#### Input from Traffic Management System to TCCS Configuration: wrong configuration data activation plan received

ID	SPRM-1663
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong activation plan is provided.
Effect on Linked Functions Systems	Wrong activation time is considered. The target system might be deactivated at a wrong time.
Effect on Railway System	Unavailability of an area or a train.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-5399 - Provide planned activation time</p> <p>relates to :  SPMS-5411 - Planned activation time</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

**Input from Integrator to TCCS Configuration: checked and signed configuration data received too early**




















ID	SPRM-1664
Failure Mode (Keyword)	Commission
Failure Description	Configuration data is checked/signed too early or a wrong time.
Effect on Linked Functions Systems	The configuration data is available sooner than expected. The data from the supplier is not available at the start of the loading process.
Effect on Railway System	No effect. The top-level configuration won't be deployed if the lower levels are not fully available.
Risk Comment	Further constraints to be defined.
Linked Work Items	relates to :  SPMS-6883 - Check+Sign configuration data relates to :  SPMS-6906 - Configuration data relates to :  SPMS-6991 - Activate configuration data (Main) relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

**Input from Integrator to TCCS Configuration: checked and signed configuration data received too late**






ID	SPRM-1665
Failure Mode (Keyword)	Omission
Failure Description	Configuration data is checked/signed too late or not at all.
Effect on Linked Functions Systems	The configuration data is not available.  The system might continue to operate with an older version that contains safety relevant issues. It might need to be set out of operation.
Effect on Railway System	Unavailability of an area or train due to restrictions imposed by the IM/RU following the detection of safety issues.
Risk Comment	Any safety issue identified in an obsolete version of the configuration is taken care of by applying restrictions on the SuC (lower speed/unavailability of area/ etc).  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-6883 - Check+Sign configuration data relates to :  SPMS-6906 - Configuration data relates to :  SPMS-6991 - Activate configuration data (Main) relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

**Input from Integrator to TCCS Configuration: wrong checked and signed configuration data received**






ID	SPRM-1666
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Failure Mode (Keyword)	Incorrect
Failure Description	Wrong configuration data is checked/signed or correct configuration data is wrongly checked/signed.
Effect on Linked Functions Systems	A wrong configuration is set to be installed. A safety-relevant command might be issued based on wrong configuration data.
Effect on Railway System	A train might move with wrong speed restrictions/wrong movement authority/ wrong system activated/etc.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-6883 - Check+Sign configuration data</p> <p>relates to :  SPMS-6906 - Configuration data</p> <p>assesses :  SPRM-109 - [B.1.1] Failure to operate the infrastructure</p> <p>assesses :  SPRM-116 - [B.1.2] Failure to operate a train or rail vehicle</p> <p>assesses :  SPRM-130 - [B.1.0] Other un-coded operation failure</p> <p>assesses :  SPRM-274 - [B.2.2] Failure of the braking system</p> <p>assesses :  SPRM-277 - [B.2.0] Other failures of the rolling stock</p> <p>assesses :  SPRM-297 - [B.3.1.3] Wrong side signalling (infrastructure) failure</p> <p>assesses :  SPRM-300 - [B.3.1.5] Failure of the level crossing equipment</p> <p>assesses :  SPRM-301 - [B.3.1.0] Other failure of the track</p> <p>assesses :  SPRM-314 - [B.3.0.2] Train detection equipment failure (trackside)</p> <p>causes :  SPRM-71 - [A1] Collisions</p> <p>causes :  SPRM-77 - [A2] Derailments</p> <p>causes :  SPRM-81 - [A3] Level Crossing Accident</p> <p>causes :  SPRM-87 - [A4] Accidents to persons involving rolling stock in motion</p> <p>assesses :  SPRM-278 - [B.2.0.1] Wrong side signalling (on-board) failure</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

**Input from Data Preparation to TCCS Configuration: signed configuration data received too early**





















ID	SPRM-1670
Failure Mode (Keyword)	Commission
Failure Description	Configuration data is provided/signed too early or a wrong time.
Effect on Linked Functions Systems	The configuration data is available sooner than expected.
Effect on Railway System	No effect.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-5395 - Provide+sign configuration data</p> <p>relates to :  SPMS-6907 - Configuration data</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

**Input from Data Preparation to TCCS Configuration: signed configuration data received too late**






ID	SPRM-1671
Failure Mode (Keyword)	Omission
Failure Description	Configuration data is provided/signed too late or not at all.
Effect on Linked Functions Systems	<p>The configuration data is not available.</p> <p>The target system might continue to operate with an older version that contains safety relevant issues. It might need to be set out of operation.</p>
Effect on Railway System	Unavailability of an area or train due to restrictions imposed by the IM/RU following the detection of safety issues.
Risk Comment	<p>Any safety issue identified in an obsolete version of the configuration is taken care of by applying restrictions on the SuC (lower speed/unavailability of area/ etc).</p> <p>Further constraints to be defined.</p>
Linked Work Items	<p>relates to :  SPMS-5395 - Provide+sign configuration data</p> <p>relates to :  SPMS-6907 - Configuration data</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

**Input from Data Preparation to TCCS Configuration: wrong signed configuration data received**






ID	SPRM-1672
Failure Mode (Keyword)	Incorrect

Failure Description	Wrong configuration data is provided and signed.
Effect on Linked Functions Systems	A wrong configuration is set to be installed. A safety-relevant command might be issued based on wrong configuration data.
Effect on Railway System	A train might move with wrong speed restrictions/wrong movement authority/ wrong system activated/etc.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-5395 - Provide+sign configuration data</p> <p>relates to :  SPMS-6907 - Configuration data</p> <p>causes :  SPRM-77 - [A2] Derailments</p> <p>causes :  SPRM-81 - [A3] Level Crossing Accident</p> <p>causes :  SPRM-87 - [A4] Accidents to persons involving rolling stock in motion</p> <p>causes :  SPRM-71 - [A1] Collisions</p> <p>assesses :  SPRM-109 - [B.1.1] Failure to operate the infrastructure</p> <p>assesses :  SPRM-116 - [B.1.2] Failure to operate a train or rail vehicle</p> <p>assesses :  SPRM-130 - [B.1.0] Other un-coded operation failure</p> <p>assesses :  SPRM-274 - [B.2.2] Failure of the braking system</p> <p>assesses :  SPRM-277 - [B.2.0] Other failures of the rolling stock</p> <p>assesses :  SPRM-297 - [B.3.1.3] Wrong side signalling (infrastructure) failure</p> <p>assesses :  SPRM-298 - [B.3.1.4] Point and crossing failure</p> <p>assesses :  SPRM-300 - [B.3.1.5] Failure of the level crossing equipment</p> <p>assesses :  SPRM-301 - [B.3.1.0] Other failure of the track</p> <p>assesses :  SPRM-314 - [B.3.0.2] Train detection equipment failure (trackside)</p> <p>assesses :  SPRM-278 - [B.2.0.1] Wrong side signalling (on-board) failure</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

#### Input from Integrator to TCCS Configuration: configuration data received too early

ID	SPRM-1676
Failure Mode (Keyword)	Commission
Failure Description	Configuration data is provided too early or a wrong time.
Effect on Linked Functions Systems	The configuration data is available sooner than expected. The data from the supplier is not available at the start of the loading process.
Effect on Railway System	No effect. The top-level configuration won't be deployed if the lower levels are not fully available.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-6885 - Provide configuration data</p> <p>relates to :  SPMS-6906 - Configuration data</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>





















#### Input from Integrator to TCCS Configuration: configuration data received too late

ID	SPRM-1677
Failure Mode (Keyword)	Omission
Failure Description	Configuration data is provided too late or not at all.
Effect on Linked Functions Systems	The configuration data is not available. The system might continue to operate with an older version that contains safety relevant issues. It might need to be set out of operation.
Effect on Railway System	Unavailability of an area or train due to restrictions imposed by the IM/RU following the detection of safety issues.
Risk Comment	Any safety issue identified in an obsolete version of the configuration is taken care of by applying restrictions on the SuC (lower speed/unavailability of area/ etc).  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-6885 - Provide configuration data relates to :  SPMS-6906 - Configuration data relates to :  SPMS-6991 - Activate configuration data (Main) relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis





#### Input from Integrator to TCCS Configuration: wrong configuration data received

ID	SPRM-1678
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong configuration data is provided.
Effect on Linked Functions Systems	A wrong configuration is set to be installed. A safety-relevant command might be issued based on wrong configuration data.
Effect on Railway System	A train might move with wrong speed restrictions/wrong movement authority/ wrong system activated/etc.
Risk Comment	Further constraints to be defined.



Linked Work Items	<p>relates to :  SPMS-6885 - Provide configuration data</p> <p>relates to :  SPMS-6906 - Configuration data</p> <p>assesses :  SPRM-109 - [B.1.1] Failure to operate the infrastructure</p> <p>assesses :  SPRM-116 - [B.1.2] Failure to operate a train or rail vehicle</p> <p>assesses :  SPRM-130 - [B.1.0] Other un-coded operation failure</p> <p>assesses :  SPRM-274 - [B.2.2] Failure of the braking system</p> <p>assesses :  SPRM-277 - [B.2.0] Other failures of the rolling stock</p> <p>assesses :  SPRM-297 - [B.3.1.3] Wrong side signalling (infrastructure) failure</p> <p>assesses :  SPRM-298 - [B.3.1.4] Point and crossing failure</p> <p>assesses :  SPRM-300 - [B.3.1.5] Failure of the level crossing equipment</p> <p>assesses :  SPRM-301 - [B.3.1.0] Other failure of the track</p> <p>assesses :  SPRM-314 - [B.3.0.2] Train detection equipment failure (trackside)</p> <p>causes :  SPRM-71 - [A1] Collisions</p> <p>causes :  SPRM-77 - [A2] Derailments</p> <p>causes :  SPRM-81 - [A3] Level Crossing Accident</p> <p>causes :  SPRM-87 - [A4] Accidents to persons involving rolling stock in motion</p> <p>assesses :  SPRM-278 - [B.2.0.1] Wrong side signalling (on-board) failure</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>
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#### Input from Railway Undertaking IT System to TCCS Configuration: configuration data activation plan received too early

ID	SPRM-1679
Failure Mode (Keyword)	Commission
Failure Description	Activation plan is provided too early or at a wrong time.
Effect on Linked Functions Systems	An activation plan considering data from a earlier point in time is considered for activation/deactivation phases. The target system might be deactivated for update at a wrong time.
Effect on Railway System	Unavailability of an area or a train.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-6886 - Provide planned activation time for vehicle</p> <p>relates to :  SPMS-6910 - Planned activation time</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>





#### Input from Railway Undertaking IT System to TCCS Configuration: configuration data activation plan received too late

ID	SPRM-1680
Failure Mode (Keyword)	Omission
Failure Description	Activation plan is provided too late or not at all.







Effect on Linked Functions Systems	The system keeps the latest activation plan which is based on activation time not up to date. The target system might be deactivated for update at a wrong time.
Effect on Railway System	Unavailability of an area or a train.
Risk Comment	Any safety issue identified in an obsolete version of the configuration is taken care of by applying restrictions on the SuC (lower speed/unavailability of area/ etc).  Further constraints to be defined.
Linked Work Items	relates to :  SPMS-6886 - Provide planned activation time for vehicle relates to :  SPMS-6910 - Planned activation time relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input from Railway Undertaking IT System to TCCS Configuration: wrong configuration data activation plan received





ID	SPRM-1681
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong activation plan is provided.
Effect on Linked Functions Systems	Wrong activation time is considered. The target system might be deactivated for update at a wrong time.
Effect on Railway System	Unavailability of an area or a train.
Risk Comment	Further constraints to be defined.
Linked Work Items	relates to :  SPMS-6886 - Provide planned activation time for vehicle relates to :  SPMS-6910 - Planned activation time relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input from Trackside Assets CS System to TCCS Configuration: system state observation received too early

ID	SPRM-1979
Failure Mode (Keyword)	Commission
Failure Description	State of target system is given too early or at a wrong time.
Effect on Linked Functions Systems	The activation state is considered even though an earlier phase is the sequence (preloading for example) hasn't been completed. The current phase might stop. The configuration data in itself might be corrupted, and the activation with the new configuration won't be authorized.
Effect on Railway System	Unavailability of an area or a train until the activation is authorized.




















Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-6534 - Maintain Trackside Assets CS System configuration data</p> <p>relates to :  SPMS-6609 - Activated state of configuration data</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

#### Input from Trackside Assets CS System to TCCS Configuration: system state observation received too late





ID	SPRM-2009
Failure Mode (Keyword)	Omission
Failure Description	State of target system is given too late or not at all.
Effect on Linked Functions Systems	The activation state is not given, delayed the next phases in the sequence. The system awaits to be set in operation.
Effect on Railway System	Unavailability of an area or a train until the activation is authorized.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-6534 - Maintain Trackside Assets CS System configuration data</p> <p>relates to :  SPMS-6609 - Activated state of configuration data</p> <p>relates to :  SPMS-6991 - Activate configuration data (Main)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

#### Input from Trackside Assets CS System to TCCS Configuration: wrong system state observation received

ID	SPRM-2010
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong state of target system is given.
Effect on Linked Functions Systems	A wrong activation state is considered for the current phase, leading to a wrong execution of the next phases. The targeted system might be set in operation with potential safety issues.
Effect on Railway System	A train might move with wrong speed restrictions/wrong movement authority/ wrong system activated/etc.
Risk Comment	Further constraints to be defined.





Linked Work Items	relates to :  SPMS-6534 - Maintain Trackside Assets CS System configuration data relates to :  SPMS-6609 - Activated state of configuration data relates to :  SPMS-6991 - Activate configuration data (Main) assesses :  SPRM-109 - [B.1.1] Failure to operate the infrastructure assesses :  SPRM-116 - [B.1.2] Failure to operate a train or rail vehicle assesses :  SPRM-130 - [B.1.0] Other un-coded operation failure assesses :  SPRM-274 - [B.2.2] Failure of the braking system assesses :  SPRM-277 - [B.2.0] Other failures of the rolling stock assesses :  SPRM-278 - [B.2.0.1] Wrong side signalling (on-board) failure assesses :  SPRM-297 - [B.3.1.3] Wrong side signalling (infrastructure) failure assesses :  SPRM-298 - [B.3.1.4] Point and crossing failure assesses :  SPRM-300 - [B.3.1.5] Failure of the level crossing equipment assesses :  SPRM-301 - [B.3.1.0] Other failure of the track assesses :  SPRM-314 - [B.3.0.2] Train detection equipment failure (trackside) causes :  SPRM-71 - [A1] Collisions causes :  SPRM-77 - [A2] Derailments causes :  SPRM-81 - [A3] Level Crossing Accident causes :  SPRM-87 - [A4] Accidents to persons involving rolling stock in motion has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input from TrainCS System to TCCS Configuration: system state observation received too early




















ID	SPRM-2011
Failure Mode (Keyword)	Commission
Failure Description	State of configuration data is given too early or at a wrong time.
Effect on Linked Functions Systems	The activation state is considered even though an earlier phase is the sequence (preloading for example) hasn't been completed. The current phase might stop. The configuration data in itself might be corrupted, and the activation with the new configuration won't be authorized.
Effect on Railway System	Unavailability of an area or a train until the activation is authorized.
Risk Comment	Further constraints to be defined.
Linked Work Items	relates to :  SPMS-7248 - Maintain Train CS System configuration data relates to :  SPMS-7251 - Activated state of configuration data relates to :  SPMS-7210 - Activate configuration data (Vehicle Data) has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis

#### Input from TrainCS System to TCCS Configuration: system state observation received too late

ID	SPRM-2012
Failure Mode (Keyword)	Omission
Failure Description	State of configuration data is given too late or not at all.

Effect on Linked Functions Systems	The activation state is not given, delayed the next phases in the sequence. The system awaits to be set in operation.
Effect on Railway System	Unavailability of an area or a train until the activation is authorized.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-7248 - Maintain Train CS System configuration data</p> <p>relates to :  SPMS-7251 - Activated state of configuration data</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>

### Input from TrainCS System to TCCS Configuration: wrong system state observation received

ID	SPRM-2013
Failure Mode (Keyword)	Incorrect
Failure Description	Wrong state of configuration data is given.
Effect on Linked Functions Systems	A wrong activation state is considered for the current phase, leading to a wrong execution of the next phases. The targeted system might be set in operation with potential safety issues.
Effect on Railway System	A train might move with wrong speed restrictions/wrong movement authority/ wrong system activated/etc.
Risk Comment	Further constraints to be defined.
Linked Work Items	<p>relates to :  SPMS-7248 - Maintain Train CS System configuration data</p> <p>relates to :  SPMS-7251 - Activated state of configuration data</p> <p>assesses :  SPRM-109 - [B.1.1] Failure to operate the infrastructure</p> <p>assesses :  SPRM-116 - [B.1.2] Failure to operate a train or rail vehicle</p> <p>assesses :  SPRM-130 - [B.1.0] Other un-coded operation failure</p> <p>assesses :  SPRM-274 - [B.2.2] Failure of the braking system</p> <p>assesses :  SPRM-277 - [B.2.0] Other failures of the rolling stock</p> <p>assesses :  SPRM-278 - [B.2.0.1] Wrong side signalling (on-board) failure</p> <p>assesses :  SPRM-297 - [B.3.1.3] Wrong side signalling (infrastructure) failure</p> <p>assesses :  SPRM-298 - [B.3.1.4] Point and crossing failure</p> <p>assesses :  SPRM-300 - [B.3.1.5] Failure of the level crossing equipment</p> <p>assesses :  SPRM-301 - [B.3.1.0] Other failure of the track</p> <p>assesses :  SPRM-314 - [B.3.0.2] Train detection equipment failure (trackside)</p> <p>causes :  SPRM-71 - [A1] Collisions</p> <p>causes :  SPRM-77 - [A2] Derailments</p> <p>causes :  SPRM-81 - [A3] Level Crossing Accident</p> <p>causes :  SPRM-87 - [A4] Accidents to persons involving rolling stock in motion</p> <p>relates to :  SPMS-7210 - Activate configuration data (Vehicle Data)</p> <p>has parent :  SPRM-1595 - Transversal CCS - System definition - SL4 - Risk Analysis</p>