

# 19.0 LTR SP3 Version News

## Cameo Safety and Reliability Analyzer

Released on: November 21, 2019

### ISO 26262 Functional Safety Plugin

From version 19.0 SP3 the Cameo Safety and Reliability Analyzer Plugin can be used together with a brand new ISO 26262 Functional Safety Plugin. This plugin tightly integrates functional safety with MBSE (requires SysML plugin or Cameo Systems Modeler) and supports the ISO 26262 standard (the adaptation of IEC 61508) designed to comply with needs specific to the application sector of Electric & Electronic (E/E) systems within road vehicles. The ISO 26262 Functional Safety Plugin provides end-users with the means to perform hazard analysis and risk assessment:

- Define Malfunctioning Behaviors for each Function
- Specify an Operational Condition Library
- Define Operational Situations as a combination of Conditions
- Combine Malfunctioning Behaviors with Operational Situations to define Accident Scenarios
- Specify a Hazard Library
- Define System Level and Vehicle Level Effects
- Combine Hazards, Effects, and Accident Scenarios into Hazardous Events

The plugin also provides a way to define functional safety concepts (safety requirements and perform ASIL decomposition) as well as generate safety reports.

The screenshot shows the HARA (Hazard Analysis and Reporting) software interface. At the top, there's a toolbar with various actions like 'Add Sibling', 'Add Nested', 'Add Existing...', 'Delete', and 'Remove From Table'. Below the toolbar is a 'Criteria' section with 'Element Type' set to 'Situation' and 'Scope (optional)' set to 'HazardousEvent'. A table lists four hazardous events. The third event, 'Delayed Tilt - Normal driving in curve', is highlighted in blue. An orange arrow points to this event with the text 'Show the description area to see all information about a Hazardous Event in one place'. Below the table, a detailed view of the 'Delayed Tilt - Normal driving in curve' event is shown. This view includes sections for 'System Function', 'Malfunctioning Behavior', 'Hazard', 'System Level Effect', 'Vehicle Level Effect', and 'Safety Goal'. It also features an 'ASIL OM' section with three levels: C1 (green), E2 (yellow), and S3 (red). At the bottom, there's a table for 'Vehicle Usage', 'Traffic And People', 'Location', 'Road Condition', and 'Environmental Condition'.

#	Name	Accident Scenario	Hazard	Vehicle Level Effect	System Level Effect	ASIL	Safety Goal
1	HazardousEvent						
2	Steering Hazard	Potential for vehicle to depart the intended path/lane and collide with oncoming traffic or roadside objects before driver is able to control the situation. If steering produced unintended yaw momentum, could cause loss of control of the vehicle	<ul style="list-style-type: none"> <li>Unintended Loss of Vehicle Lateral Motion Control</li> <li>Unintended Vehicle Lateral Motion/Unintended Yaw</li> </ul>	<ul style="list-style-type: none"> <li>Vehicle body tilts in wrong direction. Vehicle center of gravity is shifted towards the outside of the curve.</li> <li>High speed collision with another vehicle or object(s)</li> </ul>	The steering system provides torque actuation unexpectedly when there is no driver request	D	1 Prevent Unintended Vehicle Lateral Motion
3	Delayed Tilt - Normal driving in curve	Vehicle entering a slight curve at approx. 0 degree vehicle body tilt angle. Low tilt angle is required but provided tilt is delayed.	Degraded Vehicle Stability	Vehicle body does not tilt (at first). Vehicle center of gravity does not move towards the center of the curve.	System tilts vehicle body after it is required	QM	
4	Inverted Tilt - Normal driving in curve	Vehicle entering a slight curve at approx. 0 degree vehicle body tilt angle. Low tilt angle is required but provided tilt is in opposite direction.	Degraded Vehicle Stability	Vehicle body tilts in wrong direction. Vehicle center of gravity is shifted towards the outside of the curve.	System tilts vehicle body in wrong direction.	A	

  

<b>System Function</b>	Tilt the Vehicle Body	<b>Hazard</b>	Degraded Vehicle Stability
<b>Malfunctioning Behavior</b>	Delayed vehicle body tilt	<b>System Level Effect</b>	System tilts vehicle body after it is required
<b>Guide Word</b>	Late	<b>Vehicle Level Effect</b>	Vehicle body does not tilt (at first). Vehicle center of gravity does not move towards the center of the curve.
<b>Safety Goal</b>			

  

**ASIL OM**

- C1** Since the curve is minimal, it is relatively easy to maintain vehicle stability. Driver can recognize the lack of immediate vehicle tilt and reduce speed.
- E2** Driving at high speed on slightly curvy roads is part of normal driving
- S3** Vehicle may hit obstacles at high speed

Vehicle Usage	Traffic And People	Location	Road Condition	Environmental Condition
Normal driving in curve				
Driving at Speed	Traffic Free Flow	Highway City Roads	AnyRoadCondition	AnyEnvironmentalCondition

Filter is not applied. 4 rows are displayed in the table.

A HARA Table allows you to define Hazardous Events as a combination of Hazards, Effects, and an Accident Scenario. The description area shows all the information about the selected Hazardous Event.

[Learn how to use the ISO 26262 Functional Safety Plugin >>](#)

#### **CSRA Plugin documentation**

[Cameo Safety and Reliability Analyzer 19.0 LTR SP3](#)

#### **News of earlier versions**

- [Cameo Safety and Reliability Analyzer 19.0 LTR SP2](#)
- [Cameo Safety and Reliability Analyzer 19.0 LTR SP1](#)
- [Cameo Safety and Reliability Analyzer 19.0 LTR](#)