

Safety Plan Lane Assistance

**Document Version: [Version]**

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# Document history

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| Date | Version | Editor | Description |
| 25th May 25, 2018 | 1.0 | Anant Yash Pande | Overview of the functional safety plan for lane assistance |
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# Introduction

## Purpose of the Safety Plan

The safety plan should provide an overview of the functional safety plan and help us plan a secure system. In order to realize the functional safety of a vehicle, we must clearly state what we must do. We define roles and outline how we can achieve them. The vehicle system to be analyzed is also described in this document. In addition, the document should talk about the safety culture including beliefs, perceptions and values and how the plan actually leads to a secure system.

## Scope of the Project

For the lane assistance project, the following safety lifecycle phases are in scope:

Concept phase

Product Development at the System Level

Product Development at the Software Level

The following phases are out of scope:

Product Development at the Hardware Level

Production and Operation

## Deliverables of the Project

The deliverables of the project are:

Safety Plan

Hazard Analysis and Risk Assessment

Functional Safety Concept

Technical Safety Concept

Software Safety Requirements and Architecture

# Item Definition

This document focuses on a Lane Assistance System that can monitor the position of a vehicle on the road. It checks if a lane change is intentional and issues a warning and / or control signals to correct if it isn’t. The system implemented in our case follows a sensory warning system, which gives it the name Haptic Lane Feedback System. The following points describe the main functions of the Lane Assist system:

* Lane Departure Warning: A warning is issued when the lane change is unintentional or defined by the system. It checks systems such as turn indicators or sensors, on whose behavior warnings are issued, in the form of steering oscillations or an acoustic signal as a warning.
* Lane Keeping Assist: The vehicle provides assistance when an inadvertent lane change warning is received to stay on the current lane. This is done by gently steering to the center of the lane.

Components of the Lane Departure Warning System:

* Sensors: A variety of sensors can be used to check if a lane change is unintentional. Cameras are the most commonly used sensor, followed by lasers or infrared or even as simple as turn signals
* Warning System: Provides a driver alarm system to prevent inadvertent lane changes. Normally, an audible signal such as a beep or a steering vibration is generated. Our system generates a steering vibration to warn the driver

Components of the Lane Keeping Assistance System:

* Power Steering / Steering Assist: When the lane departure warning system issues a warning, the steering system is activated to generate a reverse torque that slowly corrects the deviation.

Components of the System for :

 Electronic control unit (ECU): is the brain of the system. Coordinates between the sensors and the steering assist system, deciding which signal to issue a warning and which signals to treat as hold signals

# Goals and Measures

## Goals

**[Instructions:**

**Describe the major goal of this project; what are we trying to accomplish by analyzing the lane assistance functions with ISO 26262?]**

## Measures

**[Instructions:**

**Fill in who will be responsible for each measure or activity. Hint: The lesson on Safety Management Roles and Responsibilities.**

**The options are:**

**All Team Members**

**Safety Manager**

**Project Manager**

**Safety Auditor**

**Safety Assessor**

**]**

|  |  |  |
| --- | --- | --- |
| Measures and Activities | Responsibility | Timeline |
| Follow safety processes |  | Constantly |
| Create and sustain a safety culture |  | Constantly |
| Coordinate and document the planned safety activities |  | Constantly |
| Allocate resources with adequate functional safety competency |  | Within 2 weeks of start of project |
| Tailor the safety lifecycle |  | Within 4 weeks of start of project |
| Plan the safety activities of the safety lifecycle |  | Within 4 weeks of start of project |
| Perform regular functional safety audits |  | Once every 2 months |
| Perform functional safety pre-assessment prior to audit by external functional safety assessor |  | 3 months prior to main assessment |
| Perform functional safety assessment |  | Conclusion of functional safety activities |

# Safety Culture

**[Instructions:**

**Describe the characteristics of your company's safety culture. How do these characteristics help maintain your safety culture. Hint: See the lesson about Safety Culture**

**]**

# Safety Lifecycle Tailoring

**[Instructions:**

**Describe which phases of the safety lifecycle are in scope and which are out of scope for this particular project. Hint: See the** [**Intro section**](#_sh22j99mm02k) **of this document**

**]**

# Roles

**[Instructions:**

**This section is here for your reference. You do not need to do anything here. It is provided to help with filling out the development interface agreement section.**

**]**

|  |  |
| --- | --- |
| Role | Org |
| Functional Safety Manager- Item Level | OEM |
| Functional Safety Engineer- Item Level | OEM |
| Project Manager - Item Level | OEM |
| Functional Safety Manager- Component Level | Tier-1 |
| Functional Safety Engineer- Component Level | Tier-1 |
| Functional Safety Auditor | OEM or external |
| Functional Safety Assessor | OEM or external |

# Development Interface Agreement

**[Instructions:**

**Assume in this project that you work for the tier-1 organization as described in the above roles table. You are taking on the role of both the functional safety manager and functional safety engineer.**

**Please answer the following questions:**

1. **What is the purpose of a development interface agreement?**
2. **What will be the responsibilities of your company versus the responsibilities of the OEM? Hint: In this project, the OEM is supplying a functioning lane assistance system. Your company needs to analyze and modify the various sub-systems from a functional safety viewpoint.**

**]**

# Confirmation Measures

**[Instructions:**

**Please answer the following questions:**

1. **What is the main purpose of confirmation measures?**
2. **What is a confirmation review?**
3. **What is a functional safety audit?**
4. **What is a functional safety assessment?**

**]**

A safety plan could have other sections that we are not including here. For example, a safety plan would probably contain a complete project schedule.

There might also be a "Supporting Process Management" section that would cover "Part 8: Supporting Processes" of the ISO 26262 functional safety standard. This would include descriptions of how the company handles requirements management, change management, configuration management, documentation management, and software tool usage and confidence.

Similarly, a confirmation measures section would go into more detail about how each confirmation will be carried out.