



Safety Plan Lane Assistance

Document Version: [Version]

Template Version 1.0, Released on 2017-06-21



Document history

| Date | Version | Editor | Description |
|----------|---------|-------------|--------------|
| 5/1/2019 | 1.0 | Jiaxing Gao | First Commit |
| | | | |
| | | | |
| | | | |
| | | | |

Table of Contents

[Document history](#)

[Table of Contents](#)

[Introduction](#)

[Purpose of the Safety Plan](#)

[Scope of the Project](#)

[Deliverables of the Project](#)

[Item Definition](#)

[Goals and Measures](#)

[Goals](#)

[Measures](#)

[Safety Culture](#)

[Safety Lifecycle Tailoring](#)

[Roles](#)

[Development Interface Agreement](#)

[Confirmation Measures](#)

Introduction

Purpose of the Safety Plan

The purpose of the safety plan is to design a safety system to define the framework and outlines. The first step will identify the potential hazards and measuring risks. Then using the functional safety and technical safety concept reduce all those risks and hazards in system level.

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

The item in this project is a **lane assistance system** alerts, this system can give driver a warning when the vehicle accidentally departed the lane lines. Then the system attempts to steering the vehicle back to the center of the lane lines.

The two main functions of the items are:

1. Lane Departure Warning Sub-system
2. Lane Keeping Assistant Sub-system

The Lane Departure Warning Sub-system takes responsibility for warning the driver by vibrating the steering wheel.

The Lane Keeping Assistant Sub-system applying suitable torque on steering wheel to drive the vehicle stay in center of the lane

Sub-systems:

- Camera system – LDW, Inside
- Electronic Power Steering System – LKA, Inside
- Car Display System - LDW, Inside

Outside the item – Steering Wheel

Goals and Measures

Goals

The major target of this system is to ensure the lane assistance functions has enough functional safety. Also, with help of ISO 26262, this project needs to minimize the hazards and risks of the system in system level.

Measures

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

Safety Culture

- **High priority:** safety has the highest priority among competing constraints like cost and productivity
- **Accountability:** processes ensure accountability such that design decisions are traceable back to the people and teams who made the decisions
- **Rewards:** the organization motivates and supports the achievement of functional safety
- **Penalties:** the organization penalizes shortcuts that jeopardize safety or quality
- **Independence:** teams who design and develop a product should be independent from the teams who audit the work
- **Well defined processes:** company design and management processes should be clearly defined
- **Resources:** projects have necessary resources including people with appropriate skills
- **Diversity:** intellectual diversity is sought after, valued and integrated into processes
- **Communication:** communication channels encourage disclosure of problems

Safety Lifecycle Tailoring

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

Roles

| 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

1. What is the purpose of a development interface agreement?
 - Clarify the responsibilities of the different parties involved in a functional safety project
 - Describe the work products that each company will provide
 - Help avoid disputes between OEM and Suppliers
 - Clarifies who will be responsible for any safety issues in post-production
2. In this project, the OEM is supplying a functioning lane assistance system.
Supplier company needs to analyze and modify the various sub-systems from a functional safety viewpoint.

Confirmation Measures

What is the main purpose of confirmation measures?

Confirmation measures help ensure that a functional safety project improves safety, conforms to the safety plan, and follows the ISO 26262 standard.

What is a confirmation review?

Ensures that the project complies with ISO 26262. As the product is designed and developed, an independent person would review the work to make sure ISO 26262 is being followed.

What is a functional safety audit?

Checking to make sure that the actual implementation of the project conforms to the safety plan is called a functional safety audit.

What is a functional safety assessment?

Confirming that plans, designs and developed products actually achieve functional safety is called 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.