

Safety Plan Lane Assistance

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# Document history

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| 6/6/2018 | 1.0 | Jason Kang | Iniitial Draft |
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# Introduction

## Purpose of the Safety Plan

**[Instructions: Answer what is the purpose of a safety plan?]**

The purpose of this document is to ensure that safety is considered throughout the self-driving car development process. Self-driving cars are complex systems that have many components that have to be integrated with each other. This document ensures that no safety concerns are overlooked.

In addition, this document acts as documentation to show that best practices were followed and steps were taken to reduce risk to acceptable levels.

## 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

**[Instructions:**

**REQUIRED**

**Discuss these key points about the system:**

**What is the item in question, and what does the item do?**

**What are its two main functions? How do they work?**

**Which subsystems are responsible for each function?**

**What are the boundaries of the item? What subsystems are inside the item? What elements or subsystems are outside of the item?**

**OPTIONAL**

**Optionally, include information about these points as well. These were not included in the lectures, but you might be able to find this information online:**

* **Operational and Environmental Constraints. This could especially be limited to camera performance; lane lines are difficult to detect in snow, fog, etc**
* **Legal requirements in your country for lane assistance technology**
* **National and International Standards Related to the Item**
* **Records of previously known safety-related incidents or behavioral shortfalls**

**]**

# 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 | 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 Asessor | 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**

**]**

We stress the importance of safety at our company. First, we have a well documented procedure for making design decisions. This ensures that our processes are well thought out, and stresses that employees and teams are responsible for the decisions they make. Furthermore, there is a process for escalating safety concerns anonomously or not to a dedicated safety officer who ensures that actions are taken on safety concerns. The safety officer and and independent audit teams have quaterly safety reviews in which team leads and auditors discuss any revealed safety concerns. They also nominate a quarterly safety hero award which recognizes a team who made an exceptional contribution to system safety in the past quarter.

# Safety Lifecycle Tailoring

This is a modification to an existing product. Changes will only be made to the software part of the system. Software changes will also effect the system level. However, hardware will not be changed so hardware steps are out of scope.

This document includes comcept and product development steps, but will not steps after it is released for production. Those steps will be handled by another team in another document. In other words, the safety life cycle includes item defintion, hazards/risk assessment, functional safety concept, product development (of system and software) safety validation, functional safety assessment, and release to production.

# 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

**[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.**

**]**

This development interface agreement is meant to define the roles and responsibilities between our company and OEM company. This helps to ensure that both parties knows what the other party is doing and ensure that what is delivered matches expectations.

The OEM will provide a functioning lane assistance system complete with fully functioning hardware and software. Our company will analyze the sub-sytems and determine areas of improvement. We will provide a report of recommended areas of improvement and set up a meeting to discuss the findings. Actions from that meeting will drive what subsystems need to be updated for improved functional safety. These actions will be wrapped up in a new safety plan so that we can make the required improvements.

# 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?**

**]**

1. Confirmation measures are meant to ensure that ISO 26262 is actually being followed, and to ensure that any changes made make the vehicle safer.

2. A confirmation revew checks to make sure ISO 26262 is being followed.

3. A functional safety audit checks to make sure the previously defined safety plan is being followed.

4. A functional safety asessment is a check to confirm that new developments improve functional safety.

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.