Elektrobit

UDACITY

Safety Plan Lane Assistance

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Document history

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1/28/2019	1.0	Dylan Brandtner	Initial version

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Introduction

Purpose of the Safety Plan

[Instructions: Answer what is the purpose of a safety plan?]
The purpose of this safety plan is to outline the steps we plan to take to ensure the lane assistance system is functionally safe and assign roles and responsibilities to accomplish this.

Scope of the Project

[Instructions: Nothing to do here. This is for your information.]

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

[Instructions: Nothing to do here. This is for your information.]

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?
The Lane Assistance item is an ADAS system that alerts the user if it is drifting outside of its lane without using a turn signal and assists the driver in steering back into their lane.

What are its two main functions? How do they work?
The Lane Assistance System will have two functions:

1. Lane departure warning
2. Lane keeping assistance

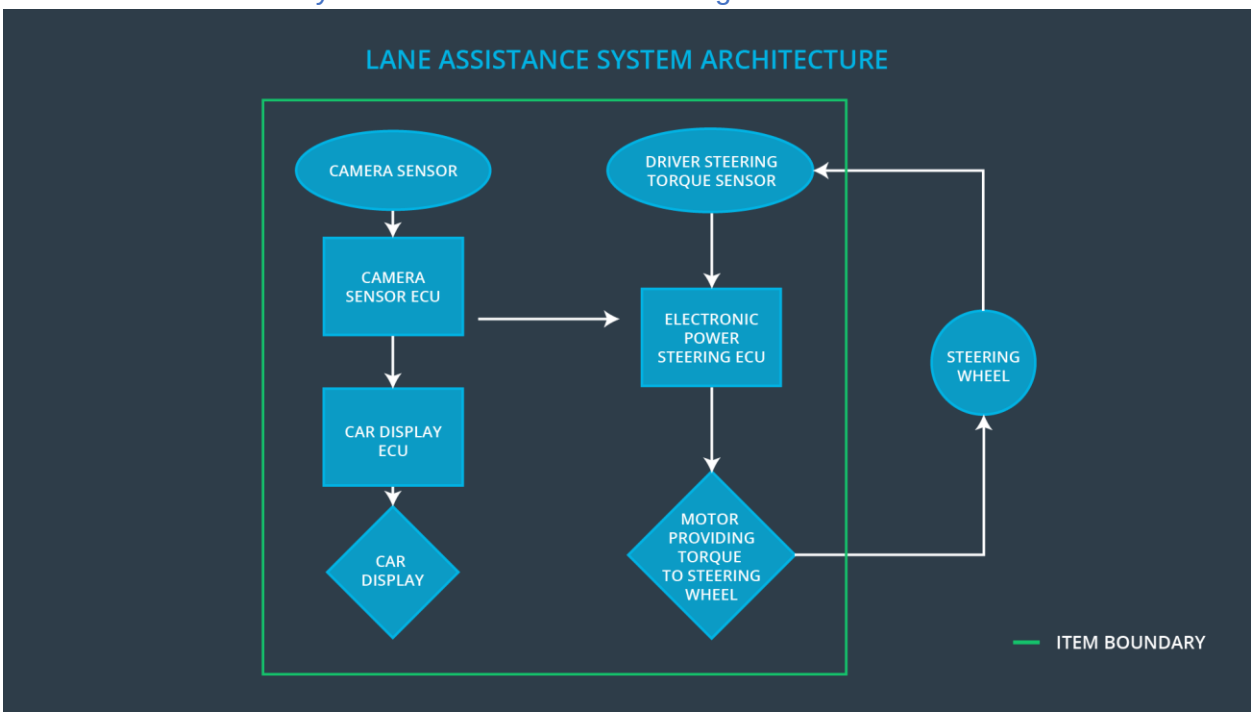
When the driver drifts towards the edge of the lane, two things will happen:

- the **lane departure warning function** will vibrate the steering wheel
- the **lane keeping assistance function** will move the steering wheel so that the wheels turn towards the center of the lane

Which subsystems are responsible for each function?
The camera, the electronic power steering, and car display subsystems are responsible for the above functions.

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

The boundaries of this system are described in the image below.



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?]
The goal of analyzing the lane assistance functions with ISO 26262 is to reduce risk to acceptable levels and create a product that is functionally safe.

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 Assessor	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 maintain a good safety culture by ensuring the following:

- Safety is the highest priority
- Team members are accountable for decisions impacting safety, and rewards and penalties are given when appropriate
- Development and safety auditing are kept independent to avoid bias
- Safety processes are well defined
- Projects have the necessary safety resources
- Intellectual diversity and communication is sought after and valued

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 of this document
]

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

[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?**

The development interface agreement serves to:

- 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 companies

- Clarify who will be responsible for any safety issues in post-production

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.**
   We are responsible for the functional safety of the camera, the electronic power steering, and car display subsystems as they relate to the lane assistance system.

]

Confirmation Measures

[Instructions:
Please answer the following questions:

1. **What is the main purpose of confirmation measures?**
   Confirmation measures ensure that a functional safety project conforms to ISO 26262, and that the project really does make the vehicle safer.
2. **What is a confirmation review?**
   A confirmation review ensures that the project complies with ISO 26262.
3. **What is a functional safety audit?**
   A function safety audit ensures that the actual implementation of the project conforms to the safety plan
4. **What is a functional safety assessment?**
   A functional safety assessment confirms that plans, designs and developed products actually achieve 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.