



Safety Plan Lane Assistance

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Document history

[Instructions: Fill in the date, version and description fields. You can fill out the Editor field with your name if you want to do so. Keep track of your editing as if this were a real world project.

For example, if this were your first draft or first submission, you might say version 1.0. If this is a second submission attempt, then you'd add a second line with a new date and version 2.0]

Date	Version	Editor	Description
20/5/2018	1.0	Mahmoud Taha	Initial version
26/5/2018	2.0	Mahmoud Taha	Resubmission

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[Instructions: We have provided a table of contents. If the table of contents is not showing up correctly in your word processor of choice, please update it. The table of contents should show each section of the document and page numbers or links. Most word processors can do this for you. In Google Docs, you can use headings for each section and then go to Insert > Table of Contents. Microsoft Word has similar capabilities]

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Introduction

Purpose of the Safety Plan

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

To create, maintain, document the following points:

- 1- Safety Culture
- 2- Safety Lifecycle
- 3- Safety Management Roles and Responsibilities
- 4- Development Interface Agreements
- 5- Confirmation Measures

To minimize the Faults in the Lane assistance project that leads to failures that leads to a hazard that produce a high level of risk

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

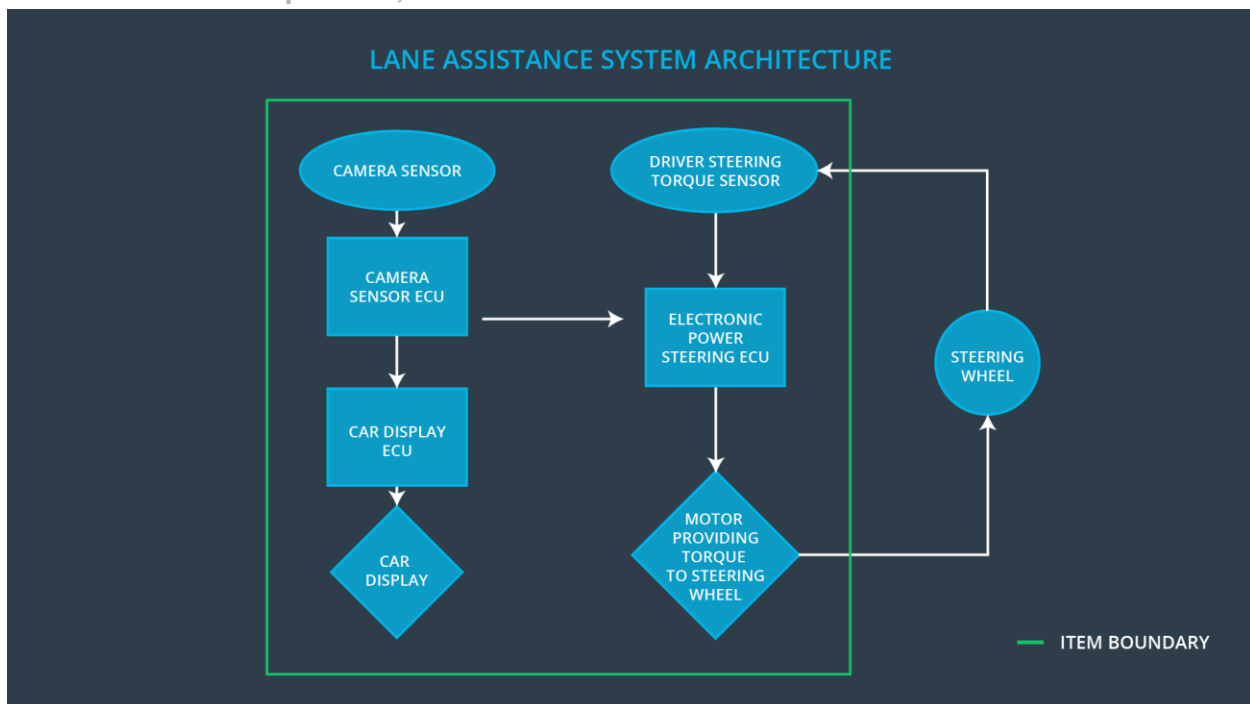
Item Definition

[Instructions:

REQUIRED

Discuss these key points about the system:

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



Lane assistance system: it helps the driver stay in lane by alarming him/her if he/she left the lane unintentionally

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

Lane departure warning, Lane keeping assist.

The Lane departure warning: If a driver departs a lane without using a turn signal, the system assumes that the driver has become distracted and did not mean to leave the lane. The system will vibrate the steering

The lane keeping assist move the steering wheel back towards the lane center.

Which subsystems are responsible for each function?

For Lane departure warning:

- 1- Camera system
- 2- Electronic Power Steering system
- 3- Car Display system

For Lane keeping assist :

- 1- Camera system
- 2- Electronic Power Steering system

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

The subsystems that are inside the item:

- 1- Camera system
- 2- Electronic Power Steering system
- 3- Car Display system

The subsystem that is outside the item is:

- 1- Steering wheel

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 in functional safety is to increase safety and avoid accidents by reducing risks to acceptable levels.

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	Safety Manager	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 Assessor	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 Auditor	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

]

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

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]

These phase of the safety lifecycle are in scope:

Concept phase
Product Development at the System Level
Product Development at the Software Level
These phase of the safety lifecycle 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?

DIA should include relevant OEM and Tier-1 company activities in detail. This should become a good reference, in case there is any conflict between involved parties in future.

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.

My company is responsible for developing and producing the systems for the OEM, or the OEM provide a preliminary product design and my company finishes the details
]

Confirmation Measures

[Instructions:

Please answer the following questions:

1. What is the main purpose of confirmation measures?

Confirmation measures serve two purposes:

- 1- that a functional safety project conforms to ISO 26262
- 2- the project really does make the vehicle safer.

2. 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.

3. What is a functional safety audit?

Checking to make sure that the actual implementation of the project conforms to the safety plan

4. What is a functional safety assessment?

Confirming 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.