Design Verification Plan and Report (DVP&R) Writing Sample

Background

To develop the original DVP&R, I used the following workflow:
- Identified the technical specification required for the verification
- Identified the relevant documents and files such as bill of materials (BoM)
- Identified set of preconditions that would make verification possible. theoretically.
- Identified the elements of the test environment.
- Identified the tools needed for conducting the test.
- Recorded basic information about the component (mechanical, moving parts, firmware, and so forth)
- Subscribed to relevant cross-functional distribution lists (groups).
- Identified and bookmarked the pertinent Jira project and
- Introduced myself to stakeholders and SMEs I did not know already and informed them that I collaborate closely with them, ensuring that DVP&R meets their needs and expectations.

Audience

The current and future hardware test engineers, system engineers, engineering domain experts, and subject-matter experts (SMEs).

Scope

Verifying the test cases for the [Vehicle] Precipitation Sensor.

About this writing sample

The following writing sample contains the list of sections and parts of the DVP&R document that explains the process of planning, testing, and reporting to verify the [Vehicle] Precipitation Sensor meets a specific set of performance and reliability requirements as defined by engineers during the design phase.

Note: To prevent proprietary issues, I have removed the original formatting and changed the company name, document name, product names, licenses, trademarks, components (including third-party components), applications, guides, codes, and sample codes where applicable.

Document title:

[Vehicle] Precipitation Sensor DVP&R

Document history:

Date	Document ID - Release Number	Authors	Notes
June 30, 2023	DVP&R 0276 - 02	Babak Rezvani	Final Look Draft 01 review comments have been incorporated in this version

Copyright

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Licensing information

Available licenses
    The following are the obtained product licenses.
    - ABC Licensed Product

Third-party components
    The following are third-party components used for the Precipitation Sensor.
    - Cable Harness

Trademarks
    The following are signs, designs, symbols, or words that have been legally registered and identify product names used in this document.

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Applicable standards

- ISO 26262-5 Second edition 2018-12
- ISO 772:2022(en) Hydrometry — Vocabulary and symbols

Reference

- Sensor Standard Specification (Sensor SS)
- Sensor Technical Specification (Sensor TS)
- Sensor Requirements Document (Sensor RD)
- Sensor Functional Requirements Document (Sensor FRD)

Before you begin

Disclaimer
- The information provided in this document must not be shared with the customers.
- This document must not be reproduced.

Not covered in this document
This document does not cover resource allocation, schedule, risk management, and defect management. Refer to the pertinent documents for related details.

Observer
An associate test engineer must be present during the test as an observer.

About Precipitation Sensor

The [Vehicle] Precipitation Sensor detects the following types of precipitations and adjusts the Wiper Motor intensity according to each precipitation type.

- Drizzle
- Rain
- Snow

The Wiper Motor intensity has the following levels:

- Wiper Motor Speed Low
- Wiper Motor Speed Medium
- Wiper Motor Speed High

Test plan overview

This test plan enables you to conduct specific tests on the Vehicle Precipitation Sensor to ensure that drizzle, rain, and snow affect the Wiper Motor as designed.
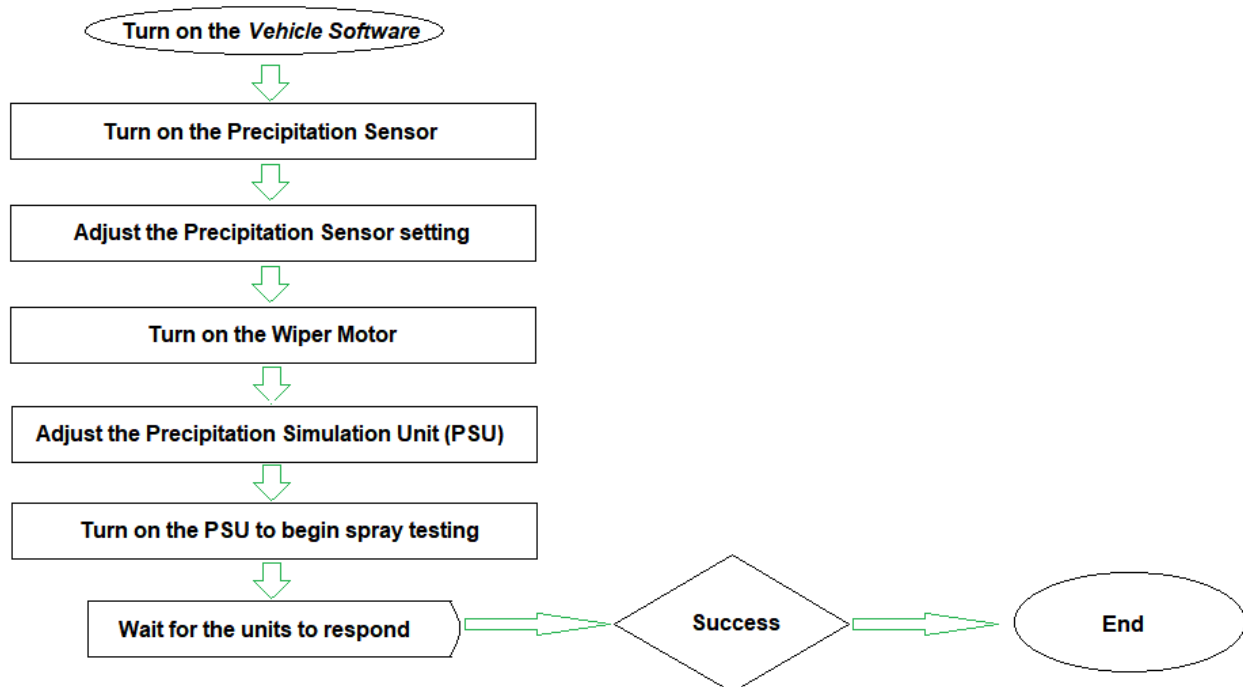
Components to test

You will conduct the test on the following components:

- Precipitation Sensor (Model PS 78945)
- Wiper Motor (Model WM 45612)

Test workflow

This workflow shows an overview of the steps in a typical successful test.

Turn on the *Vehicle Software*

⇩

Turn on the Precipitation Sensor

⇩

Adjust the Precipitation Sensor setting

⇩

Turn on the Wiper Motor

⇩

Adjust the Precipitation Simulation Unit (PSU)

⇩

Turn on the PSU to begin spray testing

⇩

Wait for the units to respond ⟹ Success ⟹ End

Test setup

> Requirements

>> Rain test chamber

>>> To conduct the precipitation simulation.

Model	QTLX-200C
High Pressure Jet Test	60 to 180kgf
Rotating Speed of Rotating-Plate	5 to 30 rpm (adjustable)
Test Standard	JIS, ISO, IEC60529, DIN40050,
Gross Weight	242kg

>> Equipments

>>> Ensure that the following equipments are available in the test chamber and operational:

Equipment	Function	Details
Voltmeter	Measures voltage	Model V3567 or Model V7891
Ohmmeter	Measures resistance	Model O1245
Ammeter	Measures current	Any model

>> Other

>>> The precipitation Sensor is installed on the Vehicle.
- The Wiper Motor is installed on the Vehicle.
- The Precipitation Sensor is connected to the Wiper Motor.
- The software and hardware required for testing are available.

Contact the Logistics Management team within the Supply Chain group if you need any of the equipment listed in the above table.

Test cases

Test ID	Test Title	Test Steps	Expected Test Result	Notes
TCPS 0001	Precipitation Type (Drizzle)	1. Turn on the Vehicle Software 2. Turn on Precipitation Sensor 3. Set sensor to Drizzle 4. Turn on Wiper Motor 5. Adjust PSU 6. Turn on PSU 7. Wait for the units to respond	The Wiper Motor must operate at low speed.	Pass/Fail/Other
TCPS 0002	Precipitation Type (Rain)	1. Turn on the Vehicle Software 2. Turn on Precipitation Sensor 3. Set sensor to Rain 4. Turn on Wiper Motor 5. Adjust PSU 6. Turn on PSU 7. Wait for the units to respond	The Wiper Motor must operate at medium speed.	Pass/Fail/Other
TCPS 0003	Precipitation Type (Snow)	1. Turn on the Vehicle Software 2. Turn on Precipitation Sensor 3. Set sensor to Snow 4. Turn on Wiper Motor 5. Adjust PSU 6. Turn on PSU 8. Wait for the units to respond	The Wiper Motor must operate at high speed.	Pass/Fail/Other