

Dependable Systems

SS 2014

Assignment 2

Failure Mode and Effect Analysis

In this assignment, it is your task to perform a failure mode and effect analysis for hardware and software.

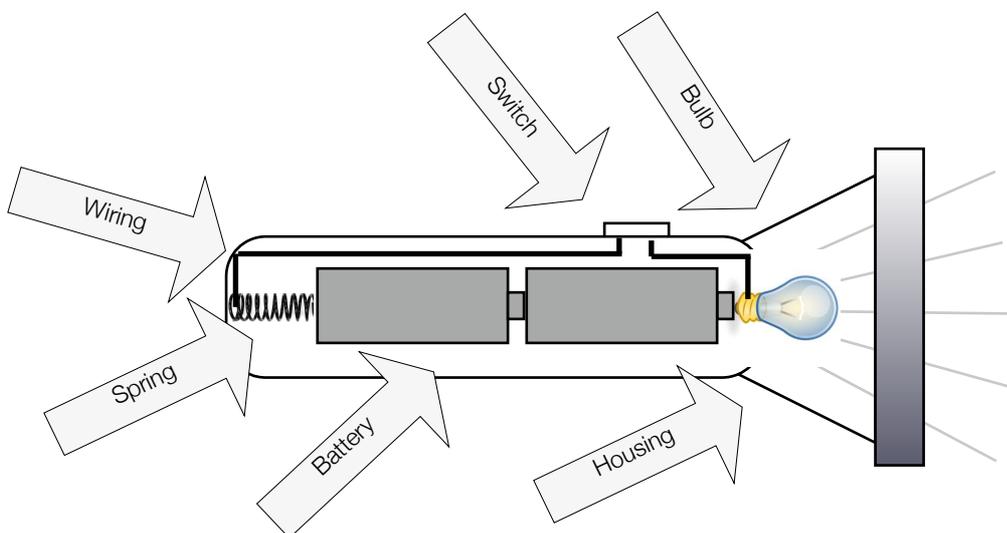
You are encouraged to form teams of 2-3 persons. You are allowed to provide a solution in German.

Please submit your written solution report as PDF document (no ZIP, no RAR) at:

<https://www.dcl.hpi.uni-potsdam.de/submit/>

Task 2.1: Flashlight Hardware - FMEA

The following figure shows the schematic picture of a simplified flashlight:



Perform a System FMEA for the flashlight architecture, given the following possible failure modes:

- Switch is on, batteries are full, no light.
- Switch is on, batteries are full, intermittent light.

Add the FMEA table to your report. Use a numeric ranking scheme between 1 and 10 for the severity, occurrence and detection ranking. Add a comment column to your FMEA sheet that explains the ranking decisions.

The batteries shall be treated as part of the system architecture that is not influenceable by recommended actions. Make sure that all relevant system parts (switch, bulb, wiring, spring, housing) are covered at least once as potential failure mode cause.

Task 2.2: Flashlight Hardware - Fault Tree

Develop a fault tree for one of the failure modes.

Add the snapshot link to <http://www.fuzzed.net> or the picture to your report.

What is the relationship between your fault tree and your FMEA sheet?

Task 2.3: Functional Software FMEA

Perform a functional software FMEA for an implementation of the *echo* command:

<http://pubs.opengroup.org/onlinepubs/9699919799/utilities/echo.html>

The FMEA analysis is intended to improve the test suite for the implementation of *echo* in a particular system.

Re-use the failure and cause definitions for software FMEA discussed in the lecture. Add the FMEA table to your report.

Develop your own system for the remaining categorizations (such as severity level), and explain it also in the report.