

BOMBARDIER



Master's Thesis:

Improvements of the current simulation environment in system test

Background

Because we are developing high availability safety critical applications it is important to have efficient test environments on different levels. Testing starts on the lowest level with component testing, then sub-system testing and then system testing. To minimize the cost of testing we use a simulated environment in combination with a limited target environment. When using the simulated environment in system test, it is important to know that the simulation is correct according to real life conditions.

Objective

The objective is to analyse and document the current simulation environment in system test in relation to real life conditions. Also, to collect data as required, identify possibilities for improvements, and propose and execute those improvements.

Software with known faults from previous testing has to be tested both in current environment and in the new environment. The new environment refers to the simulated environment with implemented improvements proposed by this thesis. Detection rate of failure modes should be measured in current and new test environment to see if improvements in the test environment leads to known defects (failure modes) being detected.

1. Describe the current test environment on system and sub-system level.
2. Acquire data for real life operating conditions (with operational scenarios).
3. Identify gaps and possibilities for improvement.
4. Develop and implement solutions.
5. Research technical details of failure modes that slipped through testing (not being detected). Identify Root Causes, failure mode triggers and measure Failure Rates. Investigate why they slipped through testing without detection.
6. Test the solutions in comparison to known faults detection rate. It should be tested how good the implemented improvements in the test systems actually are or will be. Can we detect the failure mode now every time we test?

Application

Prerequisites: Good analytical ability and complex system knowledge. Knowledge in software test techniques and root cause analysis is also valuable.

For more information, contact

Anders Claesson
Anders.claesson@rail.bombardier.com
073-433 1815