



## ADENEAS Newsletter #1

### Modelling Reliability

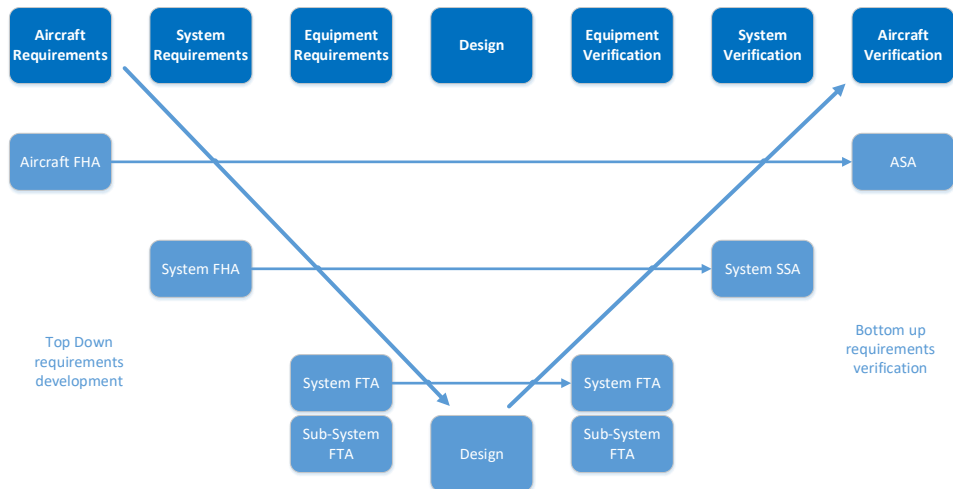
Hello! I am Kees Nuyten and I am a Technology Team Lead at Fokker Elmo Research and Technology Department. Within the ADENEAS project I am the project coordinator.

ADENEAS develops technology enablers to pave the way for a safe, light, self-configuring, autonomous and modular power and data distribution network that is scalable to all aircraft sizes. For the data distribution network a hybrid network combining wired, wireless and power line communication, is expected to become most beneficial. The idea is to combine specific strength of these media and to determine to what extend this is beneficial (WP6 and WP7).

A challenge to go for wire-substitutes, is to achieve required reliability. ADENEAS develops mechanisms to raise reliability for wireless and power line communication (WP2 and WP3) that are evaluated along the project.

The functional behavior of a data network is complex and organic. The data network is shared by different electrical systems and common practices in reliability calculation in support of certification are envisioned to be respected. Current practice relies on a reliability figure at link level as input to system fault tree analysis being part of aircraft certification as shown in the figure below in the V-model.

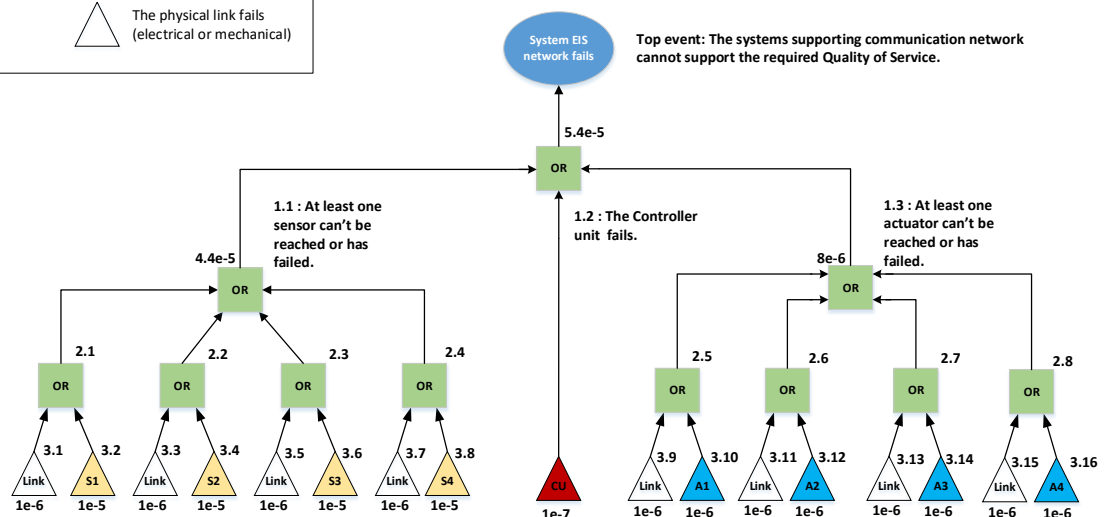
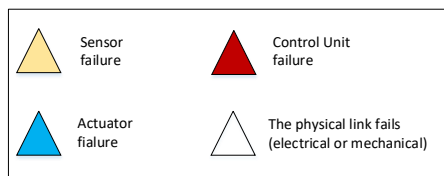




The V-model combines time and hierarchy. From left to right the common sequence of activities can be recognized while top-down requirements and verification against them is provided in a breakdown structure.

ADENAS applies for a method combining a capture of the stochastic functional behavior of the data network and the typical hardware based fault tree analysis. WP2 and WP3 develop methods to simulate the network behavior and a method to incorporate this into the typical fault tree analysis, as shown in the figure below.

### Legend



The method combines the typical fault tree analysis structure embedding link reliability of the data network. The approach is to let link reliability become the outcome of the simulation of the network behavior.

So far this approach is expected to be valid and a proper way to evaluate the project delivered results.