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Design Risk Analysis and Importance of Involving a Statistical Mind-Set

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Design Risk Analysis is often resembled with doing a Design Failure Mode and Effects Analysis (DFMEA). By doing a DFMEA a structure is defined where the customer technical requirements are mapped to functions, and the functions are mapped to failure modes that contains a cause and effect description. This is in a qualitative way ranked and managed.

The challenge in a Design Risk Analysis work as well as when doing Reliability work is to get accurate quantitative numbers to express the probability of failure for a certain failure mode.

In the International Aerospace Quality Group and now in Supply Chain Management Handbook a Guidance document has been written with the aim to assist a standard AS9145 on Advanced Product Quality process, where the concept of Design Risk Analysis is used. This guidance material describes a process and framework for Design Risk Analysis, where DFMEA is used as recording tool, but where a more elaborate uncertainty thinking is used. This uncertainty thinking is referring to the concept of Knowledge Space and Design Space, and the ability to predict outcome and robustness of outcome. The toolbox therefore consists of Design of Experiments, Monte-Carlo simulations and Geometry Assurance simulations as tools to be used to map a Knowledge Space and to simulate effects of variation and the search for a Robust Design Solution.

In this presentation the existence of this guidance will be presented and discussed.

Keywords

Reliability, Risk, Design of experiment

Classification

Mainly methodology

Primary author: Dr KNUTS, Sören (GKN Aerospace Sweden)

Presenter: Dr KNUTS, Sören (GKN Aerospace Sweden)

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