MADe for Safety

Identify & reduce engineering risk using failure and criticality analyses

Key benefits

- Monitor and control system safety by analyzing critical items
- Prioritize and mitigate system failures to improve design
- Diagnose and identify correct causes of failure
- Compliance to safety requirements using FMECA/ FTA

Key features

- Failure Diagrams
- Failure Effect Simulation (Dependency Mapping)
- Criticality Analysis
- FMEA/FMECA
- Critical Item Analysis
- Functional FTA

With an increasing demand for safety requirements for a system it is becoming more important to effectively and efficiently manage the safety of a design in a controlled and integrated manner. It is essential to be able to analyze the safety concurrently to the design process and be able to generate safety-related analyses such as FMECA or FTA.

MADe is a model-based tool that can provide these key safety-related analyses on-demand from the model at any level to satisfy safety assessments and requirements on a continual basis throughout the design lifecycle.

How to effectively design and improve the safety of a system?

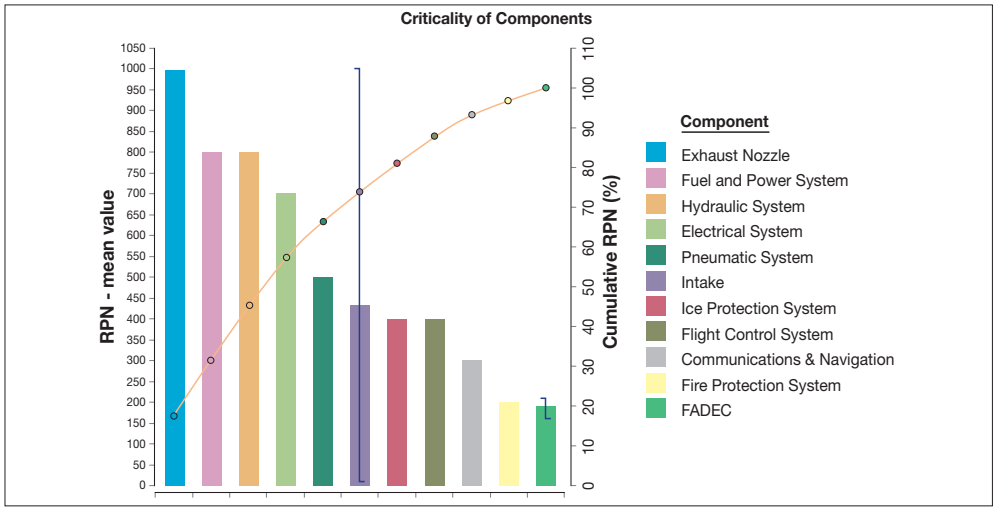


Figure 1: Comparison of various subsystem mean criticality values

Why use MADe for safety?

MADe is a model-based integrated toolset that generates safety analyses from the model, including FMECA, Critical Item List and FTA. Since the analyses are generated from the model, they can be updated as the design matures and generated on-demand by the user to inform the design process.

What does MADe provide?

As a model-based tool for designing and assessing technical risk, MADe offers many unique features:

- Accurate taxonomy driven failure analysis
- Graphical representations of failures and dependencies
- Automatic tracking of model and data changes

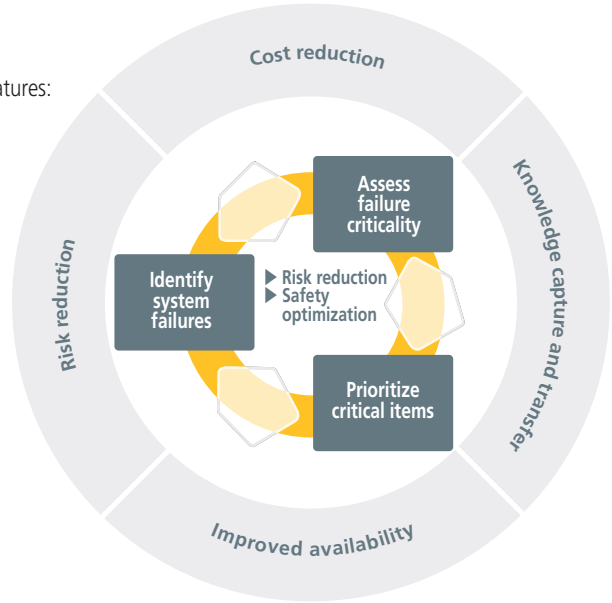
How does MADe offer an optimized approach to safety analysis?

By using MADe to conduct Safety Analysis on a design, a more accurate, repeatable, clear and traceable process can be performed. This allows for effective analysis to be produced concurrently to the system design, to mitigate risks before they occur.

So what?

Using MADe to design and assess risk of the system allows for:

- Identify and control the design or acquisition of critical items
- Mitigate the occurrence, detectability or severity of key system failures
- Document the safety of the system at key design maturity stages



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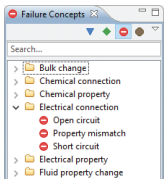
decisions better MADe...

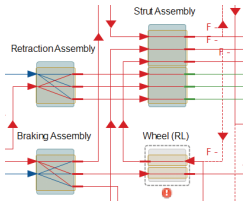
How does MADe support Safety Analyses?

How to identify potential failures?

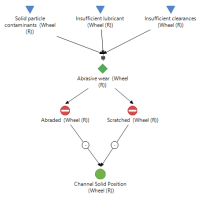
Standardized Taxonomy for Functions and Failure Concepts



Functional Model



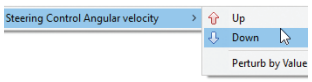
Failure Diagram



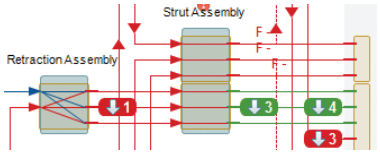
- Failure identification based on functional dependencies within the asset.
- Define and capture causes/ mechanisms/faults/symptoms associated with each failure.

How can local, next and end effects of critical failures be determined?

'What-if' Analysis of Various Failure Scenarios



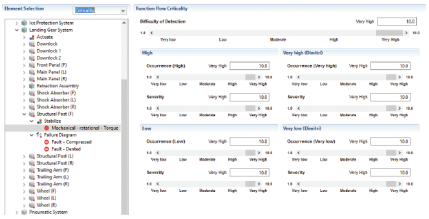
Automated Failure Propagation and Stepping



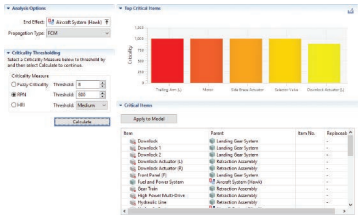
- Understand failure dependencies and effects across the system.
- Generate accurate failure data for analysis (FMECA, RCM, etc.).

What is the criticality of the item failures? (bottom-up approach)

Criticality Failures



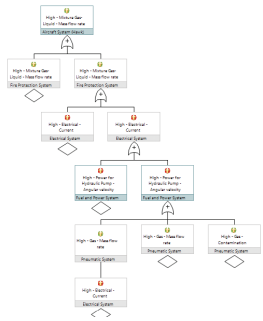
Critical Item Analysis



- Assess the occurrence, severity and detectability of failures.
- Analyze the model to flag critical items based on analysis.

Verify the analysis using an FTA (top-down approach).

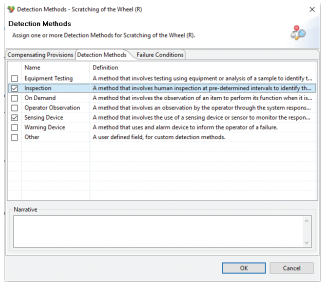
Fault Tree Analysis



- Review the chain of events from a system effect to component failure using a top-down approach.

Can the failure criticality be mitigated?

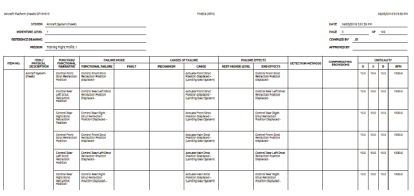
Compensating Provisions and Detection Methods



- Apply compensating provisions or detection methods to the design to reduce the criticality of a failure.

Document the resultant criticality of the system.

FMECA Report



- Document the resultant criticality of each failure, including any provisions to mitigate the failure.

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