

## An integrated analysis-driven sustainment process

### Key benefits

- ▶ Understand lifecycle impacts (availability and cost)
- ▶ Integrated risk Identification and mitigation
- ▶ Optimize the decision process
- ▶ Knowledge capture / transfer

### Key features

- ▶ Integrated analyses to support trade studies
- ▶ Automate technical validation of trade studies
- ▶ Standardized analysis workflows
- ▶ Standardized data taxonomies

**The Problem:** Each modern defence organisation seeks to optimize the Readiness of mission critical defence assets and the Mission / Budget impact of maintenance. This means a range of inter-dependent decisions have to be made regarding technical engineering risks and their appropriate mitigation, in the context of evolving operational requirements and budgets. These decisions must be generated and configuration managed by a constantly evolving workforce, across the typical asset lifecycle (10-40 years).

### Solution:

A decision support solution (process and tools) that integrates the analysis capabilities required to support trade studies on Availability, Safety and Cost of Ownership. To ensure consistency in the decision process and knowledge transfer & management capability across the lifecycle with, the solution should be model based (digital) with standardized analysis workflows and data structures, a high degree of automation, and the ability to integrate with related engineering applications (e.g. PLM).

### Solution Requirements:

A process and the appropriate tools to:

- ▶ Identify and categorize risks and factors that impact availability / life-cycle cost
- ▶ Analyse identified risks and their root cause
- ▶ Develop appropriate risk mitigation actions
- ▶ Document the optimal maintenance approach
- ▶ Generate required technical / safety artefacts
- ▶ Iterate this process based on operational outcomes

### How MADe supports sustainment decisions

MADe enables the user to capture and analyze the relevant sustainment parameters for a system.

- ▶ How and where systems are used (MPD, ESI)
- ▶ When failures are expected (FBD, RBD)
- ▶ What failures are occurring and why (FMECA, FTA)
- ▶ How best to avoid / mitigate the failures (RCM, B-RCM)
- ▶ Identify the optimal maintenance costs (MCE / MAR)
- ▶ Provide traceability of maintenance trade studies
- ▶ Enable automated FRACAS / DRACAS

### How MADe provides validation

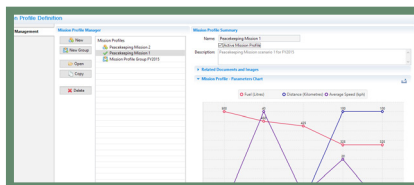
MADe uses a combined simulation model of the asset to compare alternate sustainment operating concepts. The model supports the following validation outcomes:

- ▶ Technical: reconcile functional capability with requirements
- ▶ Safety: to evidence the safety analysis (FMECA / FTA)
- ▶ Budget: estimates are supported by engineering calculations analysis

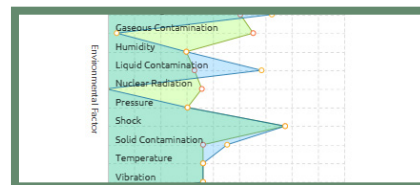
# MADe Sustainment Analysis Workflow

## Define

How and where the system is being used



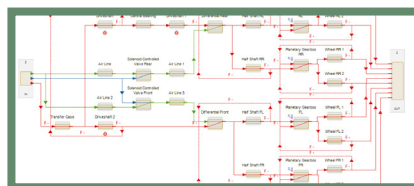
**Mission Profile Definition**



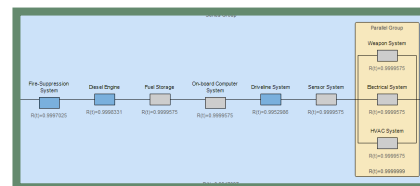
**Environment Loading**

## Model

Identify which failures are occurring and why



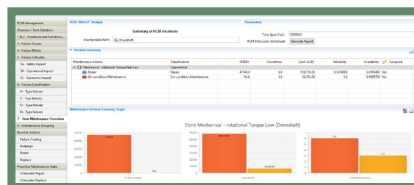
**Functional / Failure analysis**



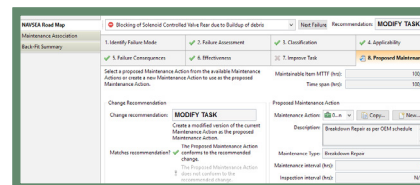
**Reliability analysis**

## Analyze / Mitigate

Identify optimal maintenance actions and strategy



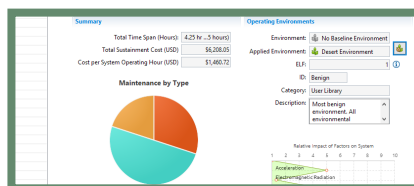
**Reliability-Centered Maintenance**



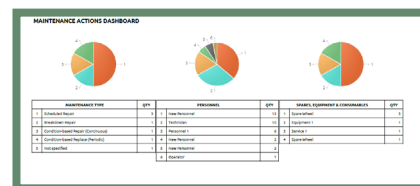
**Back-Fit RCM**

## Calculate

Document the optimal maintenance approach and expected costs



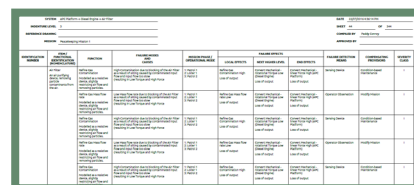
**Maintenance Cost Estimate**



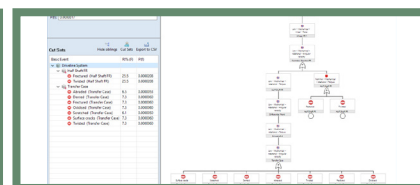
**Maintenance Action Report**

## Report

Generate analysis validation artefacts

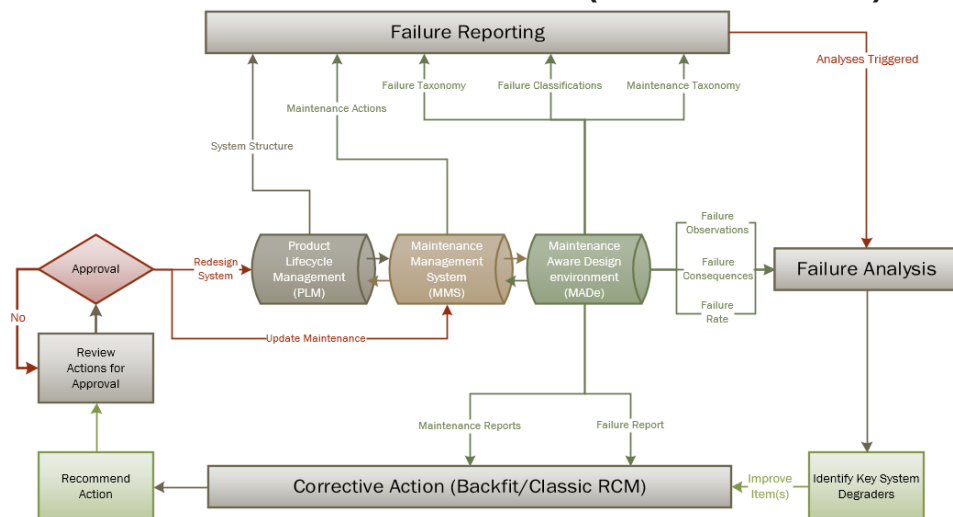


**FMEA / FMECA**



**Fault Tree Analysis**

## SOLUTION PROCESS OVERVIEW (FRACAS / DRACAS)



To arrange for a demonstration, please contact us at [info@phmtechnology.com](mailto:info@phmtechnology.com)  
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