MADE

MAINTENANCE AWARE DESIGN ECOSYSTEM

Streamline Aerospace Certification

The Maintenance Aware Design Ecosystem or MADE is a model-based safety analysis (MBSA) platform that transforms the safety assessment process for aircraft certification under ARP-4761 and ARP-4754A.

By combining simulation-based outcomes, an integrated MBSA workflow, knowledge digitization, standardized taxonomy, and the creation of a digital risk twin, MADE enables faster, more confident certification decisions. It provides a seamless environment to model, analyze, and manage system safety, helping organizations drive consistency, traceability, and risk insight across every stage of development.

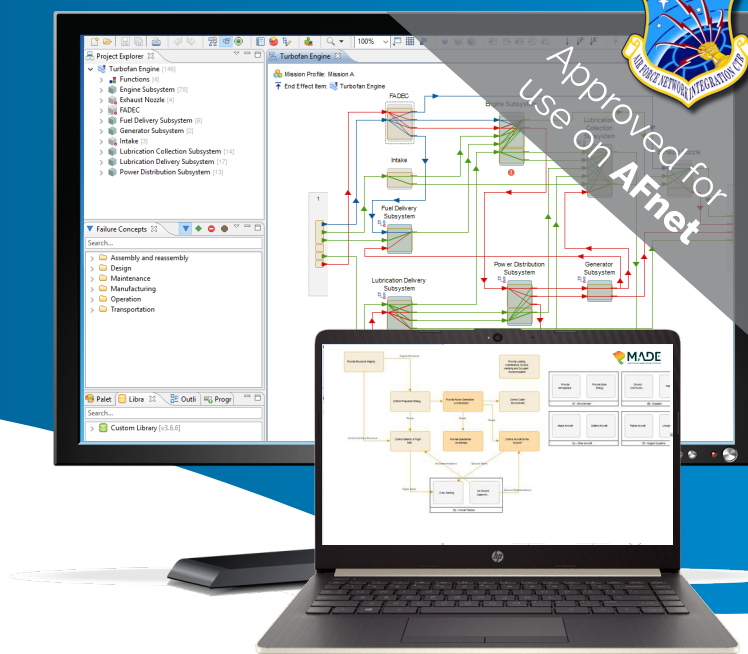The next generation of certification workflow is here, offering;

- Digital Risk Twin (DRT)
- Model-based Safety Analyses
- Digitization of Domain Knowledge
- Objective / Traceable Analyses
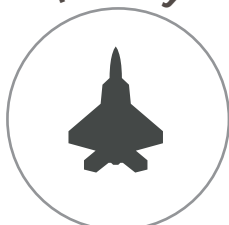- Standardized Engineering Taxonomy

GET MORE INFO

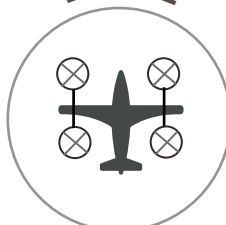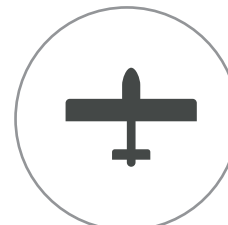Approved for use on **AFnet**

Commercial   Military   EVTOL   VTOL   UAV

MADE supports ARP-4761 & ARP-4754A

Model-based Safety Analysis - MBSA

MADE uses a Model-based Safety Analysis (MBSA) approach to faciltate the safety assessment process for Aircraft certification guidelines outlined in ARP-4761 & ARP-4754A. The MADE approach is able to support design certification from concpet through to final design.
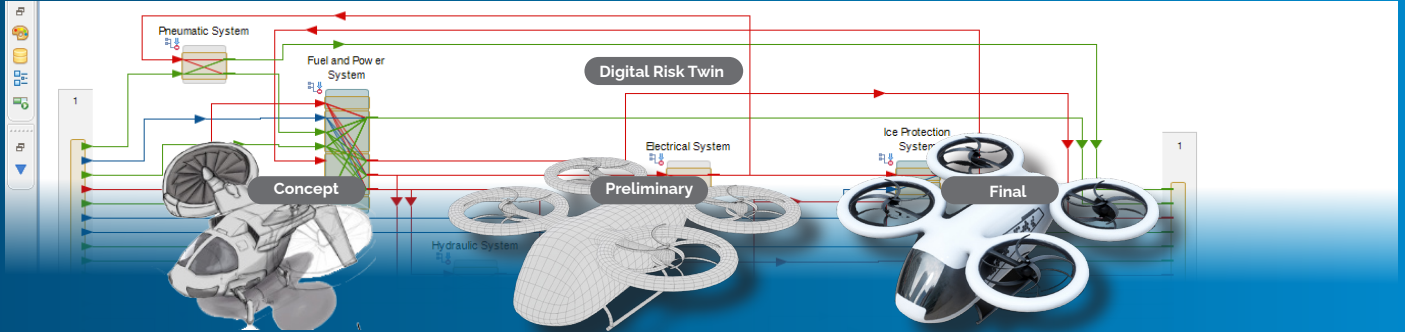
Digital Risk Twin - DRT

MADE uses a Digital Risk Twin (DRT) to develop a functional/logical aircraft model as the foundation for Functional Hazard Assessment, as well as a system logical model that captures the hierarchical structure, behavior, interconnectivity, and physics of failure of the system of interest.

Improved Consistency and Correctness

The logical model is built using functions, flows, and failure taxonomies which provide a common analysis language improving consistency and correctness. Typically developed in a top down fashion, MADE supports a hybrid top down/bottom up approach reflecting real world systems engineering practices.
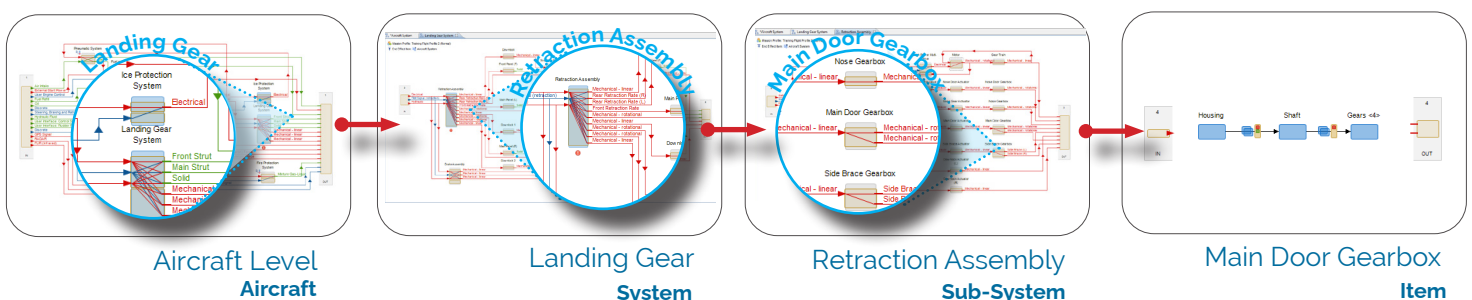
Functional Hazard and System Safety Assessment

Aircraft and System functions are developed to describe their associated failure conditions, classifications, verification techniques and other supporting material. These artefacts are decomposed and connected with the Logical Model which leverages its integrated analysis toolset to support System Safety Assessments and Common Cause Analysis.

## MADE Streamlines Change Management for Certification

This approach enhances the organizations ability to maintain continuity between design, implementation, and requirements verification.

Aircraft Model

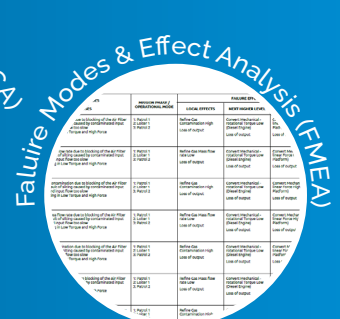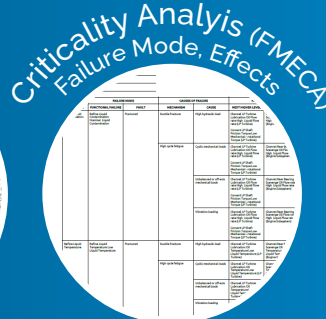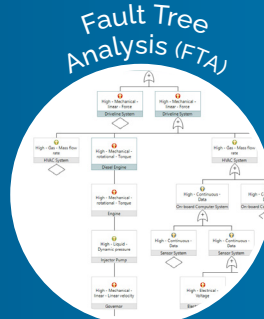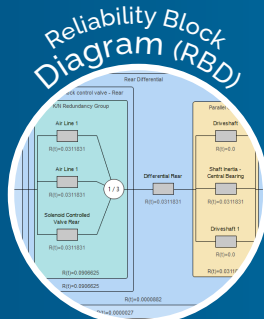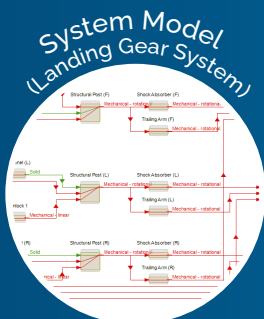| Aircraft Level	Landing Gear	Retraction Assembly	Main Door Gearbox
Aircraft	**System**	**Sub-System**	**Item**

MADE Functional Hazard Assessment (FHA)

Perform a systematic, comprehensive examination of aircraft and system functions in a traceable, integrated workflow. Use the Functional Modeler to rapidly develop the Functional Diagram of the aircraft or system to determine their failure conditions and effects of failure. MADE's FHA workflow will classify, assign requirements, define verification strategies, and set DAL for each failure condition.

System Model (Aricraft Platform)

Functional Fault Tree Analysis (FFTA)

Functional Hazard Assessment (FHA)
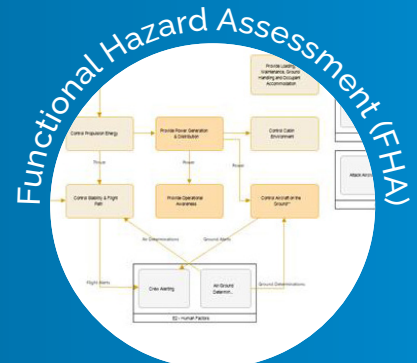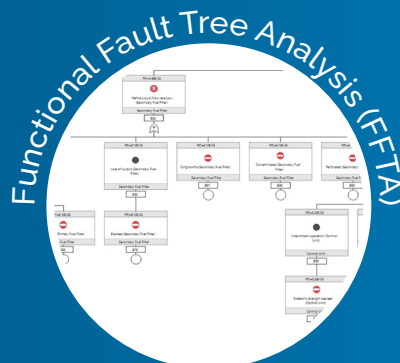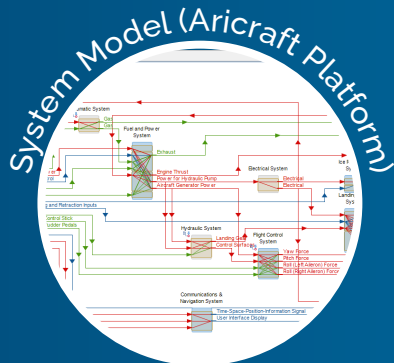
Preliminary Aircraft/ System Safety Assessment (PASA/PSSA)

System Safety Assessments are performed to evaluate the proposed aircraft and system architecture against failure conditions identified by the FHA in order to derive safety requirements.

MADE's FHA is highly integrated with the system modeler, allowing failure conditions, classifications, and numerical requirements to be linked directly with system model elements to perform (and update) FTA analyses, conduct Common Cause Considerations, and define Development Assurance Levels. MADE enables a continuous and iterative process for PASA/ PSSA and supporting SSA/ASA verification activities.

System Model (Landing Gear System)

Reliability Block Diagram (RBD)

Fault Tree Analysis (FTA)

Criticality Analyis (FMECA) Failure Mode, Effects

Failuire Modes & Effect Analysis (FMEA)

Aerospace Certification Artefacts

Platform	
	MPD (Flight phases and segments)
	Environment + Emergency Configurations
	System Model (Failure Dependency Model)
	Annotations (Model Quality Report)

SRA — Safety and Risk Assessment	
	Functional Hazard Assessment (AFHA/SFHA)
	Fault Tree Analysis
	FMECA/FMEAs
	Common Mode Analysis

RAM — Reliability, Availability and Maintainability	
	Reliability Allocation (hardware budgeting)
	Reliability Block Diagram (RBD)
	Markov Analysis (MA)
	Reliability - Centered Maintenance(RCM)

PHM — Prognostics and Health Monitoring	
	Diagnostics Table
	Sensor Set Design
	Ambiguity Groups
	Sensor Set Implementation Trade

MADE workflow overview

MADE — MAINTENANCE AWARE DESIGN ECOSYSTEM

Functional Hazard Assessment (FHA)

1 Identify Mission Profile & Environment

2 Develop Functions

3 Identify Failure Conditions/ Hazards

Preliminary Aircraft/ System Safety Assessment (PASA / PSSA)

6 Perform budgeting to developed architecture

5 Develop logical model

4 Allocate Functions /Failure Conditions to Logic

7 Derive safety requirements and detailed models

8 Generate requisite artifacts & update relevant analyses

Aerospace Certification Artefacts

MADE platform automatically produces the following reports from the model:

- FMEA/FMECA
- RA
- RBD
- RCM
- CMA
- FHA
- Maintenance Actions Reports

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