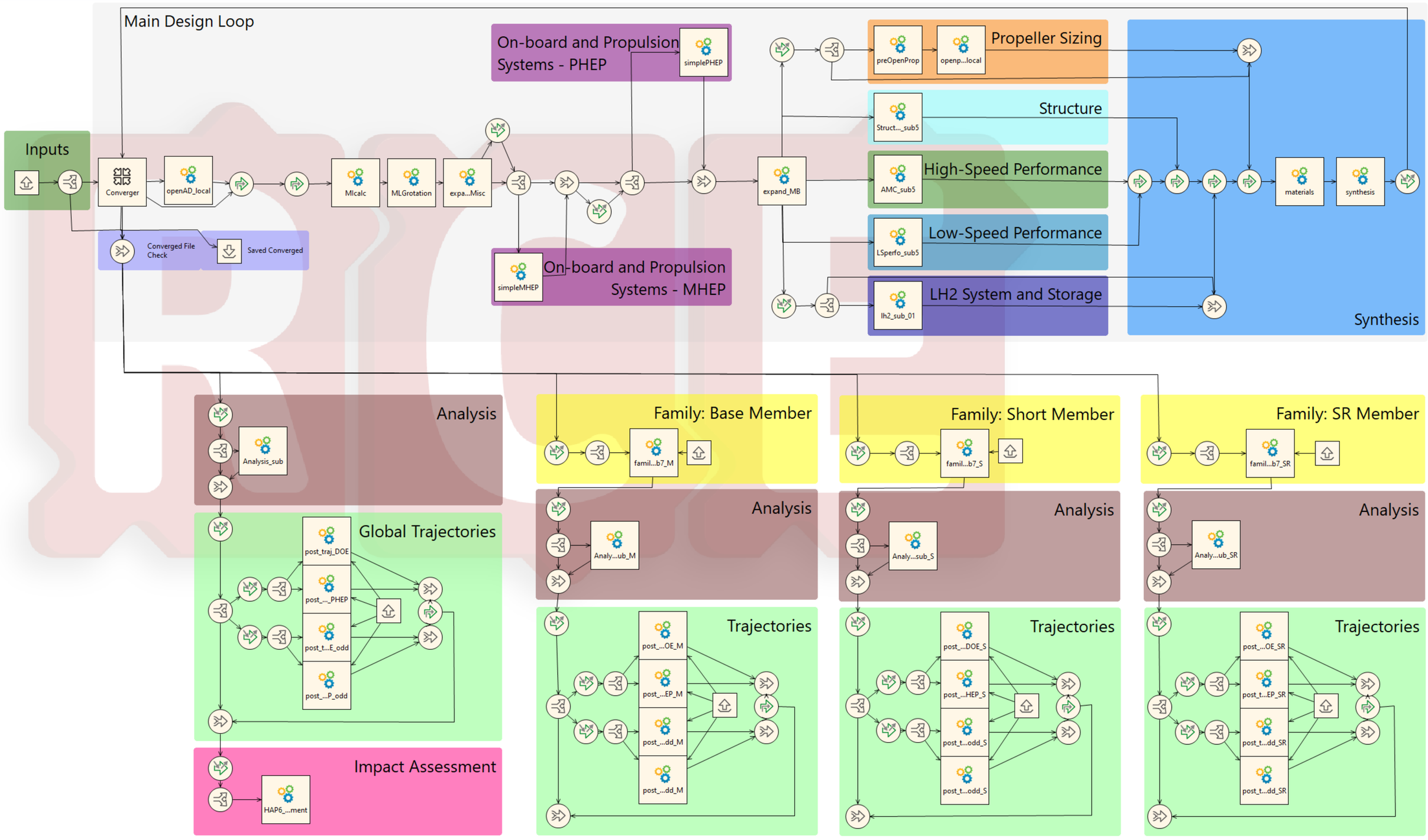
#ArchitectingAviation

OVERALL AIRCRAFT DESIGN WORKFLOW

An overview of the aircraft design methods and analysis capabilities

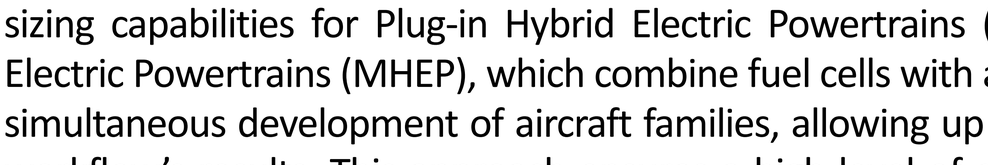


This multi-disciplinary, multi-fidelity workflow enables the design and sizing of aircraft from regional to long-range, supporting Turboprop and Turbofan propulsion systems powered by kerosene, liquid hydrogen, batteries, or hybrid combinations. It includes sizing capabilities for Plug-in Hybrid Electric Powertrains (PHEP), which integrate battery and kerosene systems, and Mild Hybrid Electric Powertrains (MHEP), which combine fuel cells with a gas-turbine powered by liquid hydrogen. The workflow also facilitates the simultaneous development of aircraft families, allowing up to three additional designs to be generated in parallel based on the main workflow's results. This approach ensures a high level of consistency across all designs by applying unified methods within a single framework. Additionally, it extends to post-processing tasks such as mission performance analysis, cabin layout visualization, weight and balance estimation, and assessments of both economic and environmental impact.

Design disciplines sub-workflows

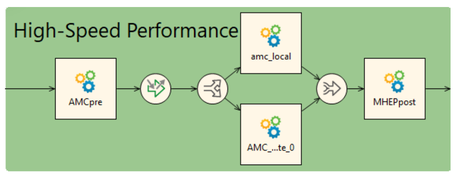
Structure sizing:

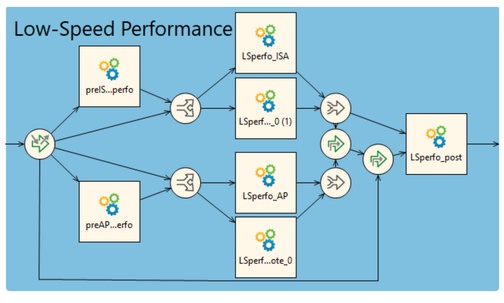
- Kilo-Meter: semiempirical calculation of operator items mass breakdown.
- LOADzero: flight loads calculation based on analytical handbook methods.
- LGLOADzero: ground and landing loads calculation based on analytical handbook methods.
- Pandora: analytical fuselage mass estimation.



High Speed Performance calculation

- AMC: mission performance calculation by stepwise solving the 2D equation of motion.

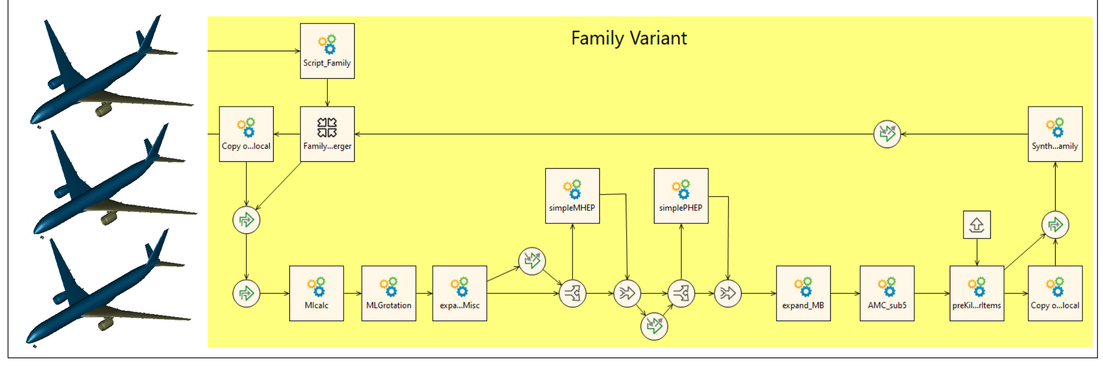




Low Speed Performance calculation:

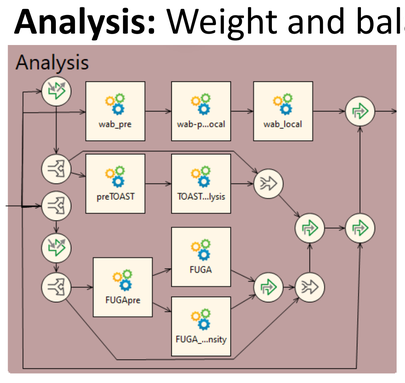
- Lsperfo: take-off and landing performance calculations by stepwise solving the 2D equation of motion.

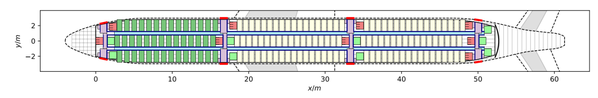
Family variant design sub-workflows

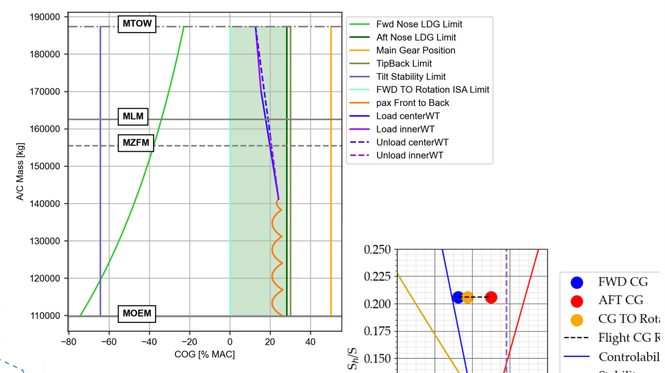


Post-processing sub-workflows

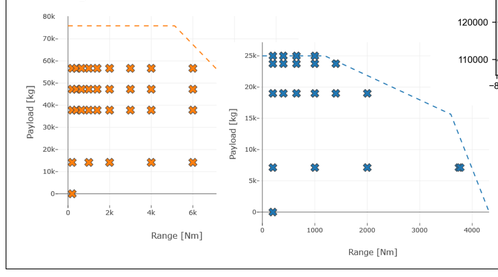
Analysis: Weight and balance, tail-plane assessment, cabin layout

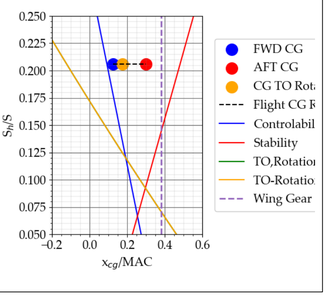






Trajectories:





Post-processing sub-workflows

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