Master Thesis Assignment

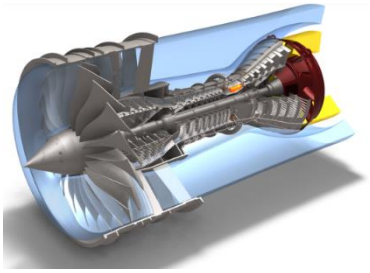
"Model based Systems Engineering - An Aerospace Jet Engine Design Study"

(30 credits/20 weeks – 1 student)

About us

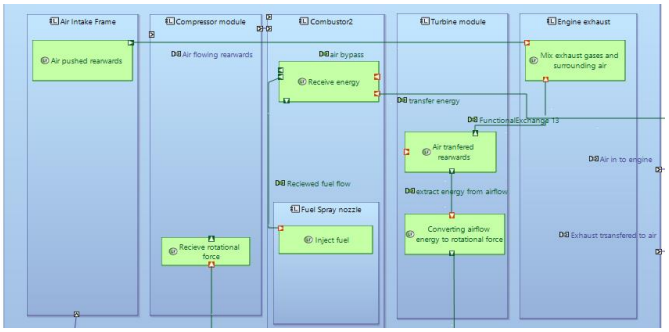
GKN Aerospace is a world leading multi-technology tier 1 aerospace supplier. With 55 manufacturing locations in 15 countries. We design and manufacture innovative smart aerospace systems and components. Our technologies are used in aircraft ranging from the most used civil aircraft to the world's advanced 5th generation fighter aircraft and the Ariane orbital rockets used by ESA.

Background of thesis project



There is an increased environmental and sustainability awareness, both in public and governmental. This drives the need for new innovations such as hybrid and electrifications to meet environmental targets, in combination with the need for reduced lead times. At the same time the complexity and interaction of involved systems are increased, raising the need for a better understanding of the relations between main systems subsystems as well as interactions between system levels.

Assignment Description



This thesis aims to explore how MBSE can support the product development process by modelling the operational need, System functions, operational logic and physical interactions. The work will encompass a literature study, a survey and interviews to identify current challenges and opportunities with MBSE.

Activities

Interview study:

- ✓ Describe the current challenges with MBSE. Challenges and opportunities. Lessons Learned.

Literature study:

- ✓ Background to MBSE.
- ✓ Best practices and state of the art.

Prescriptive study:

- ✓ How to work in a team with SMW? (E.g. multi user friendly tool,).
- ✓ Present how the tool can bes used to interacting between multidisciplinary engineering teams during concept development working on the different levels of Operational Analysis, System Analysis, Logical Architecture, Physical Architecture and EPBS

Exemplify a practical solution:

- ✓ Provide an example tool that shows and describes the workflow in SMW. With a Top-Down requirement approach and bottom up.

Research Questions

- RQ1: What are the current industrial challenges in the MBSE design process at GKN Aerospace in Trollhättan?
- RQ2: How can GKN improve their current process?

Qualifications

A background in Mechanical Engineering or Systems Engineering with interest in Product Development. Some experience in design work is favorable. One or two participants. Send application to petter.andersson@gknaerospace.com or Olof.Hannius@gknaerospace.com by November 30th, 2024