Bachelor Thesis - “Part-CAD separation with MBD” (15 credits/10 weeks – 2 students)

About us

GKN Aerospace is the world’s leading multi-technology tier 1 aerospace supplier. With 33 manufacturing locations in 12 countries, we serve over 90% of the world’s aircraft and engine manufacturers. 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.

Project Background

Historically the definition of parts has been drawing centric. When CAD was introduced it started with 2D CAD drawings and then developed into 3D geometry supporting the 2D drawing. The trend has gone from drawing centric to part centric. Part centric means the part defines the complete definition, calling out 3D models, 2D drawings, specifications etc. The next step in the development is to remove the 2D drawing and add all information into the 3D model as semantic PMI’s (Product and Manufacturing Information). This is called MBD (Model Based Definition), see appendix 1. Some of the information called out by the part, e.g. specifications, now needs to be added to the MBD to enable semantics and to identify all characteristics. This is needed for downstream use in the MBE (Model Based Enterprise), see appendix 1.

For future PLM solutions (Product Lifecycle Management) it is important to choose the best of the below principles:

- Part/MBD separation, or
- Merging part and MBD into one object.

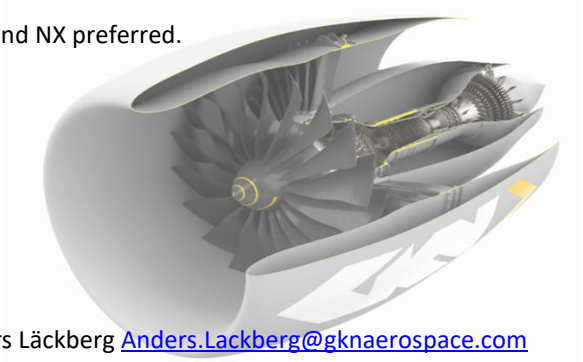
The thesis should evaluate these two principles and recommend the best choice for the future to handle MBD in the best way to ensure downstream utilization and digital thread (MBE). The thesis should also evaluate the impact when handling 2D/3D based definitions since this will be handled for a long time parallel with MBD.

Assignment Description

- Familiarize with the topic and make a detailed plan of the project
- Current state analysis of literature and standards
- Identify gaps and stake holder interests in the solution to be developed
- Gather requirements to be compared
- Selection of methods and tools to use in the study
- Test and analyze the two scenarios to give a recommendation
- Document and present results

Qualifications

- Bachelor
- Student qualifications
    - Design or manufacturing Mechanical Engineering
    - Generic CAD and PLM knowledge
    - Knowledge about PLM and specifically Siemens Teamcenter and NX preferred.



Apply by

Send your resume and cover letter to Patrik Andersson/Anders Läckberg.
Last date for application: 2025-12-05.
Start Date: The selected student is expected upon agreement
Location: GKN Aerospace, Trollhättan, Sweden

GKN contacts: Patrik Andersson patrik.r.andersson@gknaerospace.com , Anders Läckberg Anders.Lackberg@gknaerospace.com

APPENDIX 1: MBD/MBE

GKN AEROSPACE

Digitalization; Model Based definition (MBD) and Model Based Enterprise (MBE)

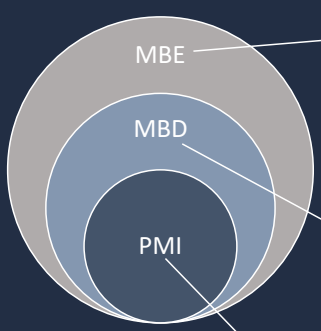
Paradigm shift: The model becomes Design Authority

The aerospace business is pushing for MBD/MBE to be used.

The Technical Data Package (TDP) will be delivered in form of Model Based Definition (MBD) and supporting documents (formats not yet decided)

Re-use MBD for analysis purposes and downstream in the MBE for e.g. manufacturing planning, supplier information etc

Part centric object based Product Lifecycle Management (PLM) system to handle the data and to handle responsive change management



Model Based Enterprise (MBE)
Re-use of MBD for e.g. analysis, manufacturing planning, suppliers across the enterprise

Model Based Definition (MBD)
Complete digital definition including 3D Model geometry, PMI and metadata

Product and Manufacturing Information (PMI)
Non-geometric annotations as dimensions, tolerances, surface finish, notes…