

## Master Thesis – Evaluation of transmission for jet engine auxiliaries

(30 HP, 1 or 2 students)

### About us

GKN Aerospace is the world's leading multi-technology tier 1 aerospace supplier. With 55 manufacturing locations in 15 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

There is ongoing work upgrading one of the jet engines GKN is responsible for, to enable increased engine thrust. The engine's high-pressure rotor drives an external gearbox, which in turn drives the engine's auxiliaries. The auxiliaries consist of pumps and regulators for fuel system, oil system and actuators for guide vanes and nozzles. When upgrading the engine, these auxiliaries will operate in changed conditions, which will change the load on the transmission. A study is required to evaluate the strength and fatigue life of the transmission under these new conditions.

### Assignment Description

The assignment consists of the following parts:

- Development of an analytical model of the pump power requirement at various operating conditions, based on data from test rigs
- Based on data from engine tests and the engine performance model (pressure, flows, rotational speeds, etc.), calculate the pumps operating points and thus power requirements
- Summarize power spectrum based on defined mission profiles
- Analyze the impact on the transmission, i.e. gear assemblies, bearings and shafts

The students will have good opportunities to see the product up close and design special rig tests if required.

### Qualifications

- Bachelor/Master's in Mechanical Engineering or similar
- Interest in whole engine systems
- Courses in the following areas would be an advantage: hydromechanics/fluid dynamics, strength/fatigue and turbomachinery
- Programming in Matlab or similar languages
- Fluent in both Swedish and English.

### Apply by

Send your resume and cover letter to:

Niklas Olofsson

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Interviews will be held continuously.

