Master Thesis - “Aero validation of purge flow in OGV” (30 credits/20 weeks – one student)

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

Recently, experimental measurements have been conducted to investigate cavity purge flow in a rotating Low-Pressure Turbine–Outlet Guide Vane (LPT–OGV) rig. Modern aero-engine designs aim to improve overall efficiency. For this reason, it is crucial to study the aerodynamic effects of cavity purge flow, as it contributes to aerodynamic losses. The aim of this master’s thesis is to validate the experimental measurements of cavity purge flow in a rotating LPT–OGV rig using Computational Fluid Dynamics (CFD) simulations. The CFD analysis will replicate the experimental conditions and incorporate purge flow into the computational domain using two different approaches:

1. **Source term method** – introducing the purge flow through momentum and mass source terms within the cavity region using user defined function.
2. **Mass flow inlet method** – applying a specified mass flow rate at the purge inlet boundary of the CFD domain.

The comparison between these two approaches will help assess their accuracy and effectiveness in capturing the aerodynamic influence of cavity purge flow on LPT–OGV performance.

Assignment Description

The aim of the master thesis job is to validate CFD solvers with the available experimental data. In particular it is required to:

- Do literature review of the project.
- Introduce purge flow in the CFD solver
- Compare the experimental measurements with simulation results
- Report the outcome of the study.

Qualifications

Student in the final year of their M.Sc. studies in the field Mechanical or Aerospace engineering with an interest in fluid mechanics. It is meritorious to have previous experience using ANSYS Fluent, using mesh software such as ICEM as well as programing experience using Matlab, and Python. Experience in Linux and writing User defined functions in ANSYS Fluent are considered advantageous.

Apply by

Send your resume and cover letter to: Shreyas Vijayendra Kumar|shreyas.vijayendrakumar@gknaerospace.com

Last date for application is 2025-12-10 but interviews will be held continuously so the position can be filled prior to the final application day.