SIEMENS
Industrial Turbomachinery AB

Master thesis: Combustion modeling of Siemens burner

Siemens is a global powerhouse in electronics and electrical engineering, operating in the industry, energy and healthcare sectors. The company has around 405,000 employees in 190 countries working to develop and manufacture products, design and install complex systems and projects, and tailor a wide range of solutions for individual requirements. For over 160 years, Siemens has stood for technical achievements, innovation, quality, reliability and internationality.

Siemens Industrial Turbomachinery AB (SIT AB) in Sweden is part of the Siemens Energy Sector. The Energy Sector is the world's leading supplier of products, services and solutions for the generation, transmission and distribution of power and for the extraction, conversion and transport of oil and gas. SIT AB delivers gas turbines, steam turbines, turn-key power plants, service and components for heat and power production. All under one roof – from research and development, manufacturing, marketing, sales and installation of turbines and complete power plants to service and refurbishing. The latest addition to the portfolio is the SGT-750, launched officially in November 2010. There are today about 2 700 employees in Finspång and about 130 in Trollhättan and the turnover is about 10 billion SEK.

Combustor department
There are about 40 persons who are responsible for the Combustor system in our gas turbines (Power output: 15-57 MW). Our main working tasks are development of Combustor systems on our existing gas turbines and development of the future engines. We also give support to other departments such as manufacturing, sales, commissioning and service.

Master thesis
In order to increase the performance of the combustor systems, we have to understand the combustion behavior by studying the combustor flow and the effect of different fuels. The burners are a central part of a gas turbine and they are utterly important to minimize the combustion dynamics and emission levels, as well as maximizing the fuel flexibility for both gas and liquid fuels. In the development process we use network models, CFD, water tests, atmospheric and high pressure combustion tests, and gas turbine engine tests. The goal of this project is to study different computational models and/or water rig tests when studying the flow dynamics and influence of different fuels on the combustion to study phenomena such as mixing, flame location, ignition, flash back etc.

The proposed work is to be performed within 20 weeks and includes preparation of geometry, mesh generation, performing CFD calculations (mainly Star-CCM+ versus Ansys CFX), data post processing and verification of the results as compared to measurement data. Previous experience with CFD programs, programming skills and/or measurements are an advantage.

We prefer that the work is started in January 2018 and is finished in the spring or summer. Main supervisors are Daniel Moëll and Daniel Lörstad, who are among our experts within combustion. If you are interested in this Master thesis project, then contact:

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