

Master Thesis: SOFC Based Hybrid System for Power Generation

Location: Baden, Aargau, Switzerland

Job Function: Research and Development

Job Function: Master Thesis, Full-Time

Publication ID: CH

Division: Industrial Automation

Internship at ABB Switzerland Ltd, Turbocharging

Your Challenge

Increasingly stringent emission regulations and the pursuit of optimum performance open the door for a variety of new opportunities to improve the environmental footprint of power systems. As a technology leader in turbocharging systems for large Diesel and gas engines, ABB Switzerland Ltd, Turbocharging actively drives innovations in this field, and toward future solutions for power generation, like fuel cells. To this end, extensive investigations are conducted at the Turbocharging Solutions department. This could also include the development and application of efficient simulation and evaluation tools as well as of suitable models of the systems to be investigated.

Your Tasks

Comprehensive study of a hybrid system comprising at least several of the following components:

- Solid Oxide Fuel Cell (SOFC)
- Pre-reformer
- Afterburner
- High temperature heat exchangers network + valves
- Turbine
- Compressor

on realistic operating point(s) in stabilized and/or transient operation.

The study will be carried-out with tools, like Excel, MATLAB or our in-house "0/1-D" simulation code, generally used for turbocharged engine simulations, and by relying the resources of the other departments appropriately. In addition, comparisons with test data could also be part of the work. Finally, technical exchanges and interaction with the student's university would be appreciated.

By intermediary of IATU-T1, ABB Switzerland Ltd, Turbocharging will pay attention to define a study which will be compliant with the academic level requested by the prepared diploma. This will preliminarily be defined with the professor in charge of the student.

The Requirements

- Graduate student (bachelor completed) of Mechanical Engineering or similar discipline
- In-depth knowledge in the field of thermodynamics, fuel cells, engines and turbomachinery
- Good communication skills, an independent work style as well as an analytical approach to problem solving
- Fluent in English, both verbal and written – German would be an asset
- Knowledge of MATLAB – additional hands-on experience with GT-Power or another 0/1-D simulation tool would be an asset

Additional information

ABB Turbocharging (www.abb.com/turbocharging) is at the helm of the global industry in the manufacture and maintenance of turbochargers for 500 kW to 80+ MW Diesel and gas engines. Our leading-edge technology and innovation enable our customers to perform better and produce fewer emissions, even in the toughest terrains. Approximately 200,000 ABB turbochargers are in operation across the globe on ships, power stations, gen-sets, Diesel locomotives and large, off-highway vehicles. We have over 100 Service Stations in more than 50 countries worldwide. In Switzerland, ABB Switzerland Ltd, Turbocharging is located in Baden and employs about 900 people.