

Masterarbeit

Dynamic switching of a load between separate power supplies

Forschungsbereiche

- Netzgekoppelte Anwendungen

Ausrichtung

- Theoretisch
- Numerisch
- Konstruktiv
- Experimentell

Themen

- Strömungsmechanik
- Thermodynamik
- Produktentwicklung
- Data Analytics

Interessant für:

MACH oder ETIT

Einstieg

ab sofort

extern:

Siemens Energy
Erlangen/ Nürnberg

Ansprechpartner

Prof. Dr.-Ing. (habil.) Andreas
Class
andreas.class@kit.edu
0721/ 608 -23487

Overview of the topic

In several parts of the world, utility power grids operate under constraints and are not capable of always meeting the required demand. On the demand (load) side this causes several problems from a business / economical perspective as well as a from a technical / maintenance / operational aspect. In order to resolve this issue, several owners of such loads turn towards to independent microgrids to cover their energy needs when the grid is not available. Such loads can be factories, mines, towns / cities or chemical plants.

The thesis aims to focus on the dynamics that occur when a fully operational load comprising several processes, drives, motors, storage, etc., switches its primary power supply from the grid to a dedicated microgrid. The thesis will cover the following topics:

- Control strategy for maintaining the microgrid in idle (no load) islanded operation
- Investigate the dynamics (reaction times) when the load switches to the microgrid
- Control strategy for mitigating severe voltage drops when the load is connected to the microgrid
- Control strategies to keep the microgrid connected during times of low voltage (avoid shutdown, similar to LVRT requirements for grid connected applications)
- Investigate load demand management strategies to reduce electrical instability impact