Application of Location Problems solving Methods for the Placement of FACTS in Transmission Grids to improve Voltage Stability

Master and Bachelor thesis

As part of the energy-politically motivated shutdown of conventional power plants and the ongoing expansion of decentralised generation units based on renewable energies, reactive power capacities in the transmission grid are reduced. This, in turn, can endanger voltage stability. In order to guarantee a stable grid voltage, compensation devices, which provide reactive power with different time requirements, can be integrated into the grid. Technologies such as synchronous condensers or STATCOMs based on power electronics enable flexible provision of reactive power and thus contribute to the stabilisation of the voltage during grid disturbances and in regular grid operation.

Figure 1: Placement of compensation devices

The aim of this thesis is the placement of compensation devices in order to increase the voltage stability under the aspect of location problems.

Goals and focus of the thesis:
Your main objectives and tasks will be:

- Implementation of criteria for the location assessment of compensation devices
- Application of optimization methods for location problems
- Investigation of the influence of the device placement on grid operation and voltage stability

Your profile:

- Study in Engineering, Industrial Engineering (electrical/energy engineering) or Computer Science
- Good skills of English in speaking and writing
- Skills in MATLAB® (advantageous)

Contact

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Focus

- Optimisation
- Stability
- Transmission Grids