RWTH AACHEN UNIVERSITY

E.ON Energy Research Center
ACS | Institute for Automation of Complex Power Systems

Master Thesis

Virtual Inertia Allocation

Context:
The incessant increase of the number of converter-interfaced renewable generation is transforming power systems into large-scale low inertia networks and hence is jeopardizing the stability of future power. To overcome these challenges, novel converter control schemes that provide virtual inertia and damping have been introduced. However, the exact amount or location of needed virtual inertia is not specified, power systems engineers usually assume that a certain inertia level needs to be maintained to avoid detrimental frequency excursions.
Now, the research question is where and how to place the virtual inertia devices so that they can provide the optimal support to the frequency of power system and enhance its performance.

Your Tasks:
Development and testing of an optimization framework for performance-based allocation of virtual inertia and damping to the converter-interfaced generators in a detailed low-inertia system.

Relevant Literature:
T. S. Borsche, T. Liu and D. J. Hill, "Effects of rotational Inertia on power system damping and frequency transients," 2015 54th IEEE Conference on Decision and Control (CDC), 2015, pp. 5940-5946, doi: 10.1109/CDC.2015.7403153.

Your Profile:
- Student of Electrical Engineering at RWTH Aachen University
- Fundamental knowledge about power system dynamics and control theory.
- Matlab/Simulink and programming are prerequisite skills.

For further information, please contact:

Diala Nouti
Tel. +49 241 80 49581
dnouti@eonerc.rwth-aachen.de

ACS | Institute for Automation of Complex Power Systems
ERC | E.ON Energy Research Center
RWTH Aachen University
Mathieustr. 30, 52074 Aachen, Germany