

Master Project/Thesis

Bachelor Thesis

Simulating the harmonic instability phenomena in low voltage distribution grid

Overview Harmonic instability is a phenomena that has been encountered a few times in power grids due to the the high level of penetration of power electronics. The political drive in Germany and Europe target the transition towards a grid relying majorly on renewable energy resources for power generation, which are interfaced to the grid through power converters. This in turn means that the phenomena is expected to increase in the future threatening the power system stability. The aim of the project is to simulate the phenomena by using power converter models devolved in Matlab/PLECS Blockset interfaced together with a grid model developed in Power factory.

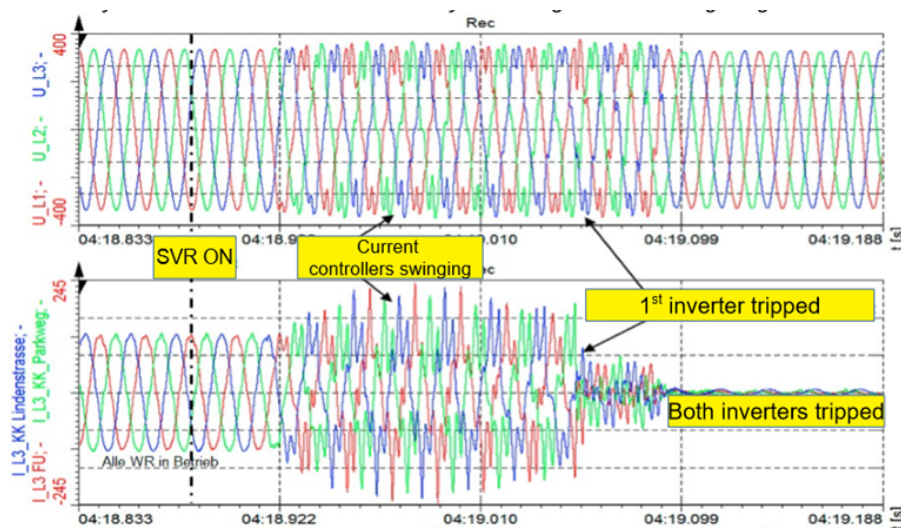


Figure 1: Measurements by BFH University within the research project “Swinging Grids”

Tasks

- Build a CIGRE benchmark low voltage ditribution grid model in Power Factory.
- Interface Matlab/PIECS Blockset power converter models with Power Factory.
- Simulate the harmonic instability phenomena.

References [1] X. Wang and F. Blaabjerg, "Harmonic Stability in Power Electronic Based Power Systems: Concept, Modeling, and Analysis," in IEEE Transactions on Smart Grid.

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