Defense Announcement

Advanced Power Sharing Scheme under Unbalanced and Nonlinear loads In Islanding Micro Grid

Mehmet Akdogan

Degree: **MS, Electrical Engineering**

Date: 07/31/2017 Time: 12:00 pm

Location: College of Technology T2 room 107

Committee Chair: Dr. Mehdi Abolhassani

Committee Members: Dr. Kaushik Rajashekara
Dr. David P. Shattuck

Active, unbalance, and harmonic power sharing inaccurately between distributed generators (DGs) and voltage quality problems are critical issues under unbalanced and nonlinear loads in the micro grids. Thus, advanced power sharing scheme with unbalanced and harmonic loads in islanding micro grid is presented to eradicate power sharing problems and reduce unbalanced voltage and harmonics distortion. The hierarchical control structure comprises primary and secondary levels. For improving voltage quality, secondary controller is designed to manage compensation of unbalanced and harmonic voltage at point common coupling (PCC). Primary controller consists of distributed generators local controllers. The local controllers mainly include power droop for sharing active and reactive power among DGs without communication, voltage and current controllers, and virtual impedance control loop. Virtual impedance loop is used to achieve better power sharing of reactive, unbalance and harmonic powers. The proposed method are provided to demonstrate that PCC voltage distortion decreases noticeably while load current sharing is improved properly after compensation.