

Seminar Talk

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Title: Enhancement of Tieline Reclosing in Microgrids using Virtual-Air-Gap Variable Reactors.

Abstract:

This presentation introduces the application of virtual-air-gap variable reactors (VAG-VRs) to realize a reliable tieline reconnection in microgrids. It is very useful to solve the problem caused by synchronization issue during tieline reconnection, especially in absence of large-area communication network to cover all microgrids. The theoretical fundamental of this method was analyzed and the tuning process for the controller of VAG-VRs was derived. The feasibility and effectiveness of this tieline reconnection method were analyzed and verified by simulations. The simulation system of a microgrid for transient and dynamic study was accomplished in Matlab/Simulink with detail models. It was proved that the transient stability can be greatly enhanced in non-conventional grids, which consist of multiple microgrids and might require an ability of frequent reliable reconnections. The simulation result demonstrated that the system oscillation was limited to less than 50% of that in unrestricted condition. The tieline reconnection controller of VAG-VRs can be easily integrated into existing variable reactor devices for industrial applications at low cost.

Bio:

Dr. Yucheng Zhang received his Ph.D. Degree in Electrical Engineering from University of South Carolina in 2010. Currently, he is an Assistant Professor in the ECE department of ODU since July 2015. Before that, he was an Assistant Professor in the ECE department at the South Dakota School of Mines and Technology from 2013 to 2015. He was a Research Assistant Professor in the department of Electrical Engineering at the University of South Carolina and the leader of MVAC baseline team in the Electric Ship R&D Consortium (ESRDC) from 2011 to 2013. His research interests focus on power electronics (e.g. switching power converters and electric motor drives); power quality control, protection and stability analysis of power systems; smart grid, microgrid and renewable energy resources.