

Chaiwat Ngamsomsod 2014: A Rating Reduction Technique for Battery Energy Storage System Utilized with Photovoltaic Distributed Generations. Master of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Assistant Professor Siriroj Sirisukprasert, Ph.D. 123 pages.

This research proposes a rating reduction technique for battery energy storage system utilized in photovoltaic power generation for reduce voltage fluctuation, which can improve its quality and meet the related standards. The main concern of the previous power smoothing techniques is the delay shown in the reference power line, which is directly proportional to the required power smoothing level. This leads to the higher rating needed for the battery systems. The proposed technique has been tested by the simulation based on the real power generation profiles of photovoltaic power generation in provincial electricity authority area in Thailand. From the study and the simulation, the proposed technique can reduce the delay of the reference power line without scarifying the quality of generated power. The lowest capacity of the battery can then be achieved. In addition, this research further verifies the proposed technique with a real islanding case. The simulation results point out that the proposed technique can effectively minimize the required battery capacity with acceptable generated power quality level.

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