

Abstract

In order to overcome the ever-challenging environmental issues such as the greenhouse gas emission, traditional energy sources are gradually being replaced by renewable energy sources. However, the increasing penetration of renewable energy sources leads to the decrease of power system inertia, as renewable sources barely contribute to inertial response. To tackle this problem, a hybrid energy storage system (HESS), which is composed of a battery and a supercapacitor, is proposed to enhance frequency control and optimize the system performance in this project. Besides, a sizing method for the HESS under contingencies is presented with the consideration of system cost and operation. Furthermore, the battery used for improving secondary frequency control performance is also considered. The effectiveness of the proposed HESS control method is verified through both short-term and long-term simulation results.

Publication

Xiangyu Zhou, Chaoyu Dong, Jingyang Fang, Yi Tang*, “Enhancement of Load Frequency Control through Using a Hybrid Energy Storage System”, *Energy, Power and Transportation Electrification (ACEPT), 2017 Asian Conference. IEEE*, 2017.