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SYSTEM MODELING AND VALIDATION OF A POTENTIAL SMART MICROGRID

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Abstract

In this paper a hybrid distributed generation system composed of two renewable energy sources, namely photovoltaic and a fuel cell is proposed. Integration of battery bank is also introduced in the overall system as energy storage system. The whole system is then modeled and simulated as an electric micro grid and a case study is carried out for Thar Desert region of India. Further, a fuzzy logic controller has been introduced to provide power on a continuous basis based on the availability of sunlight and hydrogen production and storage.. As a backup, this micro grid is being connected to the utility grid for bidirectional flow of power supply on a need basis. Simulation results proved the effectiveness of the fuzzy logic controller. Based on the preliminary analysis it has been found that these renewable energy sources would be sustainable and an economical solution for the generation of electric power for remote locations subject to the commercialization.

Keywords: Micro grid, Wind Energy Photovoltaic module, Fuel cell, Distributed generation