

Neural Network Based Fluctuation Frequency Control in PV-Diesel Hybrid Power System

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Abstract : Photovoltaic (PV) system hybrid with diesel system is utilized widely for electrification in remote area. PV output power fluctuates due to uncertainty condition of temperature and sun irradiance. When the penetration of PV power is large, the reliability of the power utility will be disturbed and seriously impact the unstable frequency of system. Therefore, designing a robust frequency controller in PV-diesel hybrid power system is very important. This paper proposes new method of frequency control application in hybrid PV-diesel system based on artificial neural network (ANN). This method can minimize the frequency deviation without smoothing PV output power that controlled by maximum power point tracking (MPPT) method. The neural network algorithm controller considers average irradiance, change of irradiance and frequency deviation. In order to show the effectiveness of proposed algorithm, the addition of battery as energy storage system is also presented. To validate the proposed method, the results of proposed system are compared with the results of similar system using MPPT only. The simulation results show that the proposed method able to suppress frequency deviation smaller compared to the results of system using MPPT only.

Keywords : energy storage system, frequency deviation, hybrid power generation, neural network algorithm

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