

Abstract

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Voltage control of self-excited induction generator driven by wind speed

This paper presents a theoretical and experimental analysis of a stand alone wind energy system using three phase squirrel cage self excited induction machine. The condition of self-excitation process of the three-phase induction generator is reviewed. The voltage of the induction generator is regulated according to operating speed range through capacitor banks. The generator regulated voltage is then rectified, regulated using a single phase push pull step down dc chopper, inverted using a single phase push pull inverter and then transformed up so as to feed an isolated single phase ac load with stabilized voltage whose magnitude and frequency are constant. Avoiding bad weather conditions is considered by using back up battery, which is charged from the wind at normal weather conditions. The system is practically implemented and experimental results are obtained. MATLAB-SIMULINK software is used to simulate the system and the transient response of the output voltage due to step change of generator voltage is presented.