

Voltage and Frequency Control of Stand-Alone Doubly-Fed Induction Generator used in WECS

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Abstract

Stand-alone Wind Energy Conversion Systems employing self-excited induction generators usually suffer from variable output voltage frequency and magnitude as the wind speed varies. In this paper, the doubly-fed induction generators (DFIGs) are used instead to overcome this problem. This is achieved by controlling the rotor input/output power of the DFIG during the whole range of wind turbine speed. At first, the wind turbine model is presented along with the dynamic model of the stand-alone DFIG. Indirect vector control algorithm is applied to control the rotor currents magnitude and frequency. The simulation results show that the proposed control scheme is able to maintain both constant output voltage magnitude and frequency irrespective of the wind speed variations. Index Terms – Wind turbine model, Doubly-fed induction generator, d-q Modelling, indirect vector control .

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