

Study for Performance Improvement of Double Speed Induction Generators Used With Independent Wind Turbines

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Abstract

Electrical energy generated by wind turbines is considered nowadays with increased interest as a promising kind of renewable Energy. Asynchronous or induction generators are considered now as one of the best types of electrical machines for using with wind turbines because of their high performance quality.

Taking into account the above mentioned factors this research aims to study the behaviour of double speed squirrel cage induction generator driven by wind turbine for improving its performance.

To achieve this goal a theoretical and practical studies were undertaken. The theoretical part was assigned to review the principle of operation of the induction generator, its equivalent circuit and steady-state mathematical model taking into account the variation of capacitor excitation and reactive power delivered to the machine. The practical study was done using a physical model of a double speed squirrel cage induction motor driven by a dc motor with variable speed. The induction generator was tested with both high and low speed of rotation. The critical speed, where machine moved to generator condition was determined for different values of excitation capacitors capacity. The relation between rotating speed and output voltage was determined for several values of excitation capacity

For the abstract in Arabic see pages (107-122).

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