Experimental Investigation and Controller Development for Variable Speed Wind-Driven DFIG

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***Abstract*—This paper investigates the performance of wind-driven Doubly fed Induction Generator (DFIG) under sub-synchronous and super-synchronous speed. A simple controller for DFIG has been proposed using low cost 555 timer ICs, flip-flops and an IGBT inverter. The controller can be adjusts the frequency of inverter pulse to obtain a desired frequency despite the variations in the rotor speed of the DFIG. A prototype of the system has been built by fabricating the controller and a three-phase IGBT bridge inverter. The controller has been tested on a 4-pole, three-phase, 400V, 5kW, delta connected prototype machine driven by a DC motor under wide speed operation. The simplified steady state analysis of the system is presented. The results of the both calculated and experimental are furnished in the paper.**

***Index Terms*— DFIG, IGBT bridge inverter, wind energy electric conversion system, power converters**

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