Abstract: This paper presents a new fuzzy-logic approach to control variable-speed wind turbine and a Doubly Fed Induction Generator (DFIG). This paper focuses on the implementation of the fuzzy controller for the active power and reactive power in slow wind speed. A vector control scheme is developed to control the rotor side voltage source converter. This scheme of vector control strategy allows the independent control of the generated active and reactive power as well as the rotor speed. In this work, a fuzzy-logic approach is proposed to control the DFIG. The paper describes a complete mathematical DFIG model. In this model, a rotor angular speed is controlled by pitch angle; the active and reactive power are controlled by rotor voltage, which goes through back-to-back PWM voltage source converter. In other way, DC-link voltage is also maintained stable. This new approach is validated by modeling using Matlab-Simulink software and results are shown. ©2010 IEEE.

Author Keywords: Doubly Fed Induction Generator (DFIG); Fuzzy logic; Wind turbine

Index Keywords: Active and reactive power; Active power; Angular speed; Control variable; DC-link voltages; Doubly fed induction generators; Doubly-fed induction generator; Fuzzy controllers; Fuzzy logic approach; Independent control; Matlab-Simulink software; New approaches; Pitch angle; Rotor speed; Rotor voltage; Vector control scheme; Vector controls; Voltage source converters; Wind speed; Asynchronous generators; DC power transmission; Electric fault currents; Fuzzy systems; Power converters; Reactive power; Wind power; Wind turbines; Fuzzy logic

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