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Fuzzy monitoring of stator and rotor winding faultsfor DFIG used in wind energy conversion system

H. MERABET, T. BAHI

Abstract: According to its high robustness, the use of doubly-fed induction generators in thewind energy conversion takes an important place in the world of production of electrical energy.This type of conversion became very attractive because of its manufacturing environments,low cost and operation with an easily available power supply. The increase interest in windenergy conversion has been accompanied by efforts to improve reliability, effective conditionmonitoring and better efficiency. In this work, a new technique is proposed for monitoring anddetection of inter-turn short-circuit ITSC and open phase circuits in the stator or rotor windingsof wind turbines based on doubly-fed induction generator The principle of the suggestedtechnique is based on the acquisition of the stator and the rotor currents of a doubly-fed inductiongenerator with the aim to calculate the values of root mean square amplitude, in addition to theknowledge expressed in rules and membership function. This technique is verified usingsimulations performed via the model of doubly-fed induction generators built in MATLAB ®Simulink.

Keywords : doubly-fed induction generator, DFIG, Fuzzy logic, Monitoring, Detection, faults, RMS