

DIAGNOSTIC DES DEFAUTS MECANQUES ELECTROMAGNETIQUES SUR LES AEROGENERATEURS À BASE DE MACHINE ASYNCHRONE À DOUBLE ALIMENTATION

Hichem MERABET

Soutenue en: 2016

Abstract: The use of doubly-fed induction machine in wind conversion systems occupies a very significant place. Therefore, the diagnosis of potential faults in these machines is nowadays a major priority for the industrialists in particular and for the scientists in general. Currently, the requirements of renewable energy, in terms of wind conversion system, is growing up due to the availability of the industrial processes became an economic argument than a mere marketing. However, the monitoring and the diagnosis require at the same time a better functional and behavioral knowledge of the system in order to highlight, in an early stage, the conditions leading to a failure situation. In this thesis, we are interested of the fault of the doubly-fed induction machine. Firstly, we will develop the doubly-fed induction machine model that can represent the machine behavior in various function modes and structural imbalances. Among the faults, the fault of static, dynamic and mixed eccentricity, and the phases openings faults, and the stator or rotor inter-turns short-circuit are considered. A spectral analysis of stator currents of the doubly-fed induction machine taken at the time of these faults will be presented subsequently. In the last part, we will develop an approach of monitoring allowing to obtain information on the machine state, the detection and the localization of the faults.

Keywords : défauts mécaniques, électromagnétique, aérogénérateurs, GADA, modélisations