

An Experimental Comparative Analysis for Broken Rotor Bars Diagnosis

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Abstract— The diagnosis of the rotor integrity is difficult and for induction motors producers represent a challenge, because they usually detect faults at the end of the manufacturing process which involves material and labor losses. So, it is important to have available a fast and reliable system to test rotors in order to keep under control the production quality and therefore to reduce manufacturing costs. The aims of this paper are to accomplish an experimental comparative analysis regarding rotor faults diagnosis methods, especially in the broken bars, and to establish the influence of these faults on low induction motors performances. For these purposes, two testing diagnosis methods were applied for rotor cages/rotors with/without faults and a testing bench control was designed for the induction motor study. As samples were considered three identical rotors with a total of 22 bars, and a stator designed for motors with rated power of 0.37 kW and speed of 1500 rpm. Two rotors were deliberately damaged by drilling holes in the bars and then used with the same stator, for a better accuracy of the tests. Slip and winding temperature rise increasing, and the loss of efficiency by 2% were revealed by performing the tests. Tested methods can be used in the rotor manufacturing control.