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Review

Rotor fault condition monitoring techniques for squirrel-cage induction machine—A review

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ABSTRACT

Nowadays, manufacturing companies are making great efforts to implement an effective machinery maintenance program, which provides incipient fault detection. The machine problem and its irregularity can be detected at an early stage by employing a suitable condition monitoring accompanied with powerful signal processing technique. Among various defects occurred in machines, rotor faults are of significant importance as they cause secondary failures that lead to a serious motor malfunction. Diagnosis of rotor failures has long been an important but complicated task in the area of motor faults detection. This paper intends to review and summarize the recent researches and developments performed in condition monitoring of the induction machine with the purpose of rotor faults detection. The aim of this article is to provide a broad outlook on rotor fault monitoring techniques for the researchers and engineers.

Contents

Abbreviations: ANN, artificial Neural Network; BRB, broken rotor bar; f_s, fundamental frequency; f_b, fault-related sideband components; I, the amplitude current of fundamental frequency; $I_{(1-2s)fs}$, the amplitude current of lower sideband; $I_{(1\pm2s)fs}$, sum the amplitude current of lower sideband and upper sideband; IAS, instantaneous angular speed; IM, induction machine; IP, instantaneous power; MCSA, motor current signature analysis; N, number of rotor bar; n, number of broken rotor bar; p, pole pair; PSD, power spectral density; s, slip; SCIM, squirrel cage induction machine

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