

Fault Detection and Diagnosis of Broken Bar Problem in Induction Motors Base Wavelet Analysis and EMD Method: Case Study of Mobarakeh Steel Company in Iran

Authors : M. Ahmadi, M. Kafil, H. Ebrahimi

Abstract : Nowadays, induction motors have a significant role in industries. Condition monitoring (CM) of this equipment has gained a remarkable importance during recent years due to huge production losses, substantial imposed costs and increases in vulnerability, risk, and uncertainty levels. Motor current signature analysis (MCSA) is one of the most important techniques in CM. This method can be used for rotor broken bars detection. Signal processing methods such as Fast Fourier transformation (FFT), Wavelet transformation and Empirical Mode Decomposition (EMD) are used for analyzing MCSA output data. In this study, these signal processing methods are used for broken bar problem detection of Mobarakeh steel company induction motors. Based on wavelet transformation method, an index for fault detection, CF, is introduced which is the variation of maximum to the mean of wavelet transformation coefficients. We find that, in the broken bar condition, the amount of CF factor is greater than the healthy condition. Based on EMD method, the energy of intrinsic mode functions (IMF) is calculated and finds that when motor bars become broken the energy of IMFs increases.

Keywords : broken bar, condition monitoring, diagnostics, empirical mode decomposition, fourier transform, wavelet transform

Conference Title : ICECECE 2019 : International Conference on Electrical, Computer, Electronics and Communication Engineering

Conference Location : Paris, France

Conference Dates : May 16-17, 2019