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A Practical and Theoretical Study on the Electromotor Bearing Defect Detection in a Wet Mill Using the Vibration Analysis Method and Defect Length Calculation in the Bearing

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Abstract : Wet mills are one of the most important equipment in the mining industries and any defect occurrence in them can stop the production line and it can make some irrecoverable damages to the system. Electromotors are the significant parts of a mill and their monitoring is a necessary process to prevent unwanted defects. The purpose of this study is to investigate the Electromotor bearing defects, theoretically and practically, using the vibration analysis method. When a defect happens in a bearing, it can be transferred to the other parts of the equipment like inner ring, outer ring, balls, and the bearing cage. The electromotor defects source can be electrical or mechanical. Sometimes, the electrical and mechanical defect frequencies are modulated and the bearing defect detection becomes difficult. In this paper, to detect the electromotor bearing defects, the electrical and mechanical defect frequencies are extracted firstly. Then, by calculating the bearing defect frequencies, and the spectrum and time signal analysis, the bearing defects are detected. In addition, the obtained frequency determines that the bearing level in which the defect has happened and by comparing this level to the standards it determines the bearing remaining lifetime. Finally, the defect length is calculated by theoretical equations to demonstrate that there is no need to replace the bearing. The results of the proposed method, which has been implemented on the wet mills in the Golgohar mining and industrial company in Iran, show that this method is capable of detecting the electromotor bearing defects accurately and on time.

Keywords : bearing defect length, defect frequency, electromotor defects, vibration analysis
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