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STUDY OF THE ADVANTAGES OF PREDICTIVE MAINTENANCE IN THE MONITORING OF ROLLING BEARINGS

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Abstract

This paper presents a theoretical study of the application of vibration envelope technique in the diagnosis of rolling bearings with the purpose of estimating their remaining life and of determining the proper time to perform the replacement of rolling bearings within the maintenance activity. Increasing the vibration level has as a consequence the lifetime reduction of rolling bearings. Enveloping is a vibration signal processing technique, necessary in the extraction of the defect characteristic frequencies from the frequency spectrums. By using the enveloping technique the premature wear of rolling bearings can be monitored. Rolling bearings are predisposed to a premature wear due to the execution and mounting quality, to the loading conditions during operation, to the very numerous cycles of operation and so on. This premature wear manifests itself through: 1. the generation of noise; 2. the loss of lubricant; 3. the failure of other components; 4. supplementary energy consumption. The present study also reveals the benefits of the predictive maintenance application in direct connection with the decrease of energy consumption, materials, noise pollution and waste quantities. At the same time, by condition monitoring and diagnostic of process equipment, the predictive maintenance has an important role about costs of maintenance activity because one third of these costs are lost due to improper application or unnecessary maintenance. Damage caused by improper maintenance can cause disasters at a large scale with negative consequences for people and environment.

Key words: consumption of materials and energy, enveloping technique of vibration, minimizing the amount of waste, noise pollution, predictive maintenance

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