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CONDITION MONITORING OF SHAFT FOR MISALIGNMENT DETECTION USING VIBRATION SIGNATURES

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ABSTRACT

Misalignment is the most common cause of machine vibrations. Vibration monitoring is a useful technique for providing useful information regarding symptoms of rotating machinery failures. This paper explains the investigation of vibration signatures at bearing away from motor of test rig due to effect of simulated faults. The faults simulated are parallel and angular misalignment of different magnitudes. The vibrations occurring in horizontal and vertical directions were measured by accelerometer combined with Fast Fourier Transform (FFT) analyzer. The study was carried out for three elastomers namely Nitrile Butadiene Rubber, Hytrel and Polyurethene. The Root Mean Square (R.M.S.) values of acceleration due to vibration were obtained for both parallel and angular misalignment conditions. The data obtained is compared on common basis of R.M.S. values of acceleration and magnitude of misalignment for different speeds. The MATLAB software is used to generalize the obtained data by curve fitting tool. These curves can be used to select the elastomers in advance according to operating conditions. The experimental data is simulated using ANSYS software. The experimental and simulated results were compared and found to be close.

KEYWORDS: Condition Monitoring, Elastomer, FFT Analyzer, Misalignment, Root Mean Square (R.M.S.) Value of Acceleration, Vibration Analysis