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## **Different Signal Processing Techniques for Predicting the Condition of Journal Bearings**

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### **ABSTRACT**

Condition monitoring is based on the idea that by monitoring the behaviour of an asset within its operating environment and analysing the information and data. CM identifies pre-failure symptoms, spot trends in deterioration and even makes predictions on when and how the item is likely to fail [1]. The main purpose of condition monitoring is to detect, diagnose and prognoses a fault, or a degradation process, that has reached a certain symptomatic level and to provide an indication of the abnormality in time before the functional breakdown occurs [2]. In addition, monitoring is the most important strategy to diagnose the faults before the plants failure. Vibration monitoring is the most commonly used and effective technique to detect internal defects in rotating machinery. Captured vibration signal data used to detect a fault in self-aligning journal bearing, or a degradation process, that has reached a certain symptomatic level and to provide an indication of the abnormality in time before the break occurs. The optimal condition parameters which produces high amplitude vibration signatures sensitive to the operating processes of self-aligning journal bearing are under high radial load (20 bars), at high motor speed (100 %) and with low viscosity lubricant (oil 32). Because of many different vibration sources, measured data from a self-aligning bearing need to be preprocessed to eliminating such influences and obtain optimal parameters to represent the dynamics of the bearing. In general, time domain and frequency domain analyses are used to process vibration signals for the purpose of effective feature attraction. Because of limitations of time and frequency domain, STFT has been developed for non-stationary signals which are also common when machinery faults occur to investigate waveform signal in both time and frequency domain at same time.

### **Keywords**

Condition monitoring, Vibration Condition, Time Domain, Frequency Domain, STFT, Journal Bearings.