

EVALUATION OF GEAR PITTING SEVERITY BY USING VARIOUS CONDITION MONITORING INDICATORS

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ABSTRACT

Fault detection techniques based on vibration measurement are implemented to identify in an early stage failures appearing in gear transmissions. Condition monitoring indicators (CMI), like: Root Mean Square (RMS), Kurtosis, Crest Factor, FMO, FM4, M6, NB4, Energy ratio, NA4 or Energy operator, are used to estimate the level of gear faults such as pitting, cracks, spalling, scuffing or scoring. However, in is multitude of indicators, the question that arises is: which CMI is the most sensitive in estimating the severity of defects? Thus, this paper presents an extensive comparison between the before mentioned indicators computed from vibration signals collected on four pinions with different pitting grades, created by artificial means. The pinions where incorporated in a single helical gearbox and the tests were performed on an open-energy test rig at three different input speeds. This comparative study assesses the receptivity of different condition monitoring indicators towards gear pitting failure.

Keywords: condition monitoring indicators, fault diagnosis, gear pitting