The Importance of Multiple Data Sources for Condition Monitoring: A Wind Industry Case Study

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Abstract

There is some terminology confusion within the wind industry surrounding definitions of vibration analysis and Condition Monitoring (CMS). A good CMS program will incorporate every available data source into a decision-making model for reliability studies. If available, this will include vibration analysis. In the Wind industry, a good reliability program considers analysis from a wind turbine's on-board Vibration Monitoring system, Supervisory Control and Data Acquisition (SCADA) unit, oil particle count sensor, tribology information and any visual representations of damage (from endoscopy or other). These analyses are used to make informed decisions on health and status of the operating asset and in turn maximises the efficiency of the operating service and maintenance teams.
This paper attempts to use the industry known P-F curve (Prevention-Failure) to demonstrate the importance of using multiple data sources, as described above, for the purposes of reliability. In doing so, real-world case studies will be provided demonstrating the challenges of early damage detection faced in the wind industry. The central aim is to correctly define the methodologies available and provide the cost-benefit analysis for each, both individually and combined.