

Risk-Based, Investment Analysis for Condition Monitoring Systems in Manufacturing

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Abstract: Condition monitoring systems (CMSs) are collections of software and devices that alert users to the changing condition of an asset or system. They can provide diagnostic, prognostic, or anomaly detection services. In practice CMS software solutions can provide great value but also pose significant upfront and ongoing investments. An industrial facility needs to regularly and objectively review these investments to justify these costs and identify possibilities for improvement. The objective assessment of a CMS can help companies maximize their competitive advantage in the maintenance and monitoring space.

Understanding the ongoing investment returns for a CMS requires an understanding of the benefits and risks in both the monitoring system and the assets being monitored. The purpose of a CMS is to avoid bad or unwanted scenarios that may affect the system. Interpreting value through counting scenarios that did not happen is neither easy nor intuitive. However, this is the necessary calculation needed to correctly interpret the usefulness of a CMS. The prescribed procedure in this talk estimates the change in likelihood of possible outcomes (i.e., risk) as a method for quantifying the value of a condition monitoring system. The procedure estimates the suitability of a CMS for any active physical industrial system in relatable terms of risk and investment analysis. The procedure incorporates information from sources such as expert opinions, maintenance logs, FME(C)As, simulations, and ‘best / worst case’ scenario heuristics.