Rethinking maintenance terminology for an industry 4.0 future

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Relevance to the Centre

Sensors and mathematical models have been used since the 1990's to assess the health of systems and diagnose anomalous behavior. The advent of the Internet of Things (IoT) increases the range of assets on which data can be collected cost effectively. Cloud-computing and the wider availability of data and models are democratizing the implementation of prognostic health (PHM) technologies. Together, these advancements and other Industry 4.0 developments are creating a paradigm shift in how maintenance work is planned and executed. In this new future, maintenance will be initiated once a potential failure has been detected (using PHM) and thus completed before a functional failure has occurred. Thus corrective work is required since corrective work is defined as "work done to restore the function of an asset after failure or when failure is imminent." Many metrics for measuring the effectiveness of maintenance work management are grounded in a negative perspective of corrective work and do not clearly capture work arising from condition monitoring and predictive modeling investments. In this paper, we use case studies to demonstrate the need to rethink maintenance terminology. The outcomes of this work include 1) definitions to be used for consistent evaluation of work management performance in an Industry 4.0 future and 2) recommendations to improve detection of work related to PHM activities.

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