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Data-driven performance measurement of maintenance activities

An adaptable end-to-end maintenance performance diagnostic framework for continuous improvement

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Good maintenance performance is crucial for the safe and efficient operation of large industrial plants in various engineering fields, including offshore oil and gas production. Maintenance Performance Measurement (MPM) frameworks are commonly used for maintenance performance monitoring and strategy development. However, many existing MPM frameworks do not exhibit enough impact on maintenance decisions, despite numerous resources and effort spent on their development. This can be caused by deviation of maintenance practices from strategies, loss of data quality and lack of a holistic performance view.

To address these issues, this study proposes a data-driven maintenance performance diagnostic framework to support fast and comprehensive evaluation of maintenance activities. The first part of the framework summarizes high-level performance from both equipment and maintenance viewpoints, enabling rapid check of overall performance across systems. The second part of the framework allows a more detailed end-to-end process performance evaluation from effectiveness, efficiency and compliance domains. The derivation of case-specific performance indicators is facilitated by a structured and heuristic approach that links diagnostic aspects to available data. The proposed framework is generic and can be used as a decision support tool to locate performance issues and prioritize focus areas for continuous improvement.

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