Management of Maintenance Strategy: Innovative Management Approaches for Maximizing Maintenance Efficiency and System Reliability

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Abstract:

Effective maintenance strategy management is essential for ensuring high levels of operational efficiency, system reliability, and cost optimization in industrial environments. This article presents an innovative framework for managing maintenance strategies by integrating proactive, preventive, predictive, and corrective approaches. The proposed framework aims to enhance decision-making processes, reduce downtime, and optimize resource allocation by balancing short-term interventions with long-term reliability objectives. By leveraging data-driven methodologies, such as condition-based monitoring and advanced analytics, the framework provides a systematic approach for assessing equipment health, scheduling interventions, and minimizing operational risks. Additionally, this research introduces new evaluation metrics that incorporate cost variability and robustness, enabling organizations to make more informed maintenance decisions. The findings demonstrate that a comprehensive, adaptive maintenance strategy can significantly improve asset performance, reduce total maintenance costs, and support sustainable operations. The article concludes with recommendations for implementing these management practices across various industrial sectors to maximize maintenance efficiency and bolster system reliability.

Keywords:

Maintenance management, asset management, resource allocation, decision-making, operational efficiency, performance optimization, strategic planning.