

**BREAKING BARRIERS: PERFORMANCE OPTIMIZATION OF SUPER BIG
DIGGER AT PT ABC USING DMAIC**

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STATEMENT BY THE AUTHOR

I hereby declare that this thesis is my own original work. To the best of my knowledge, it does not contain any material that has been previously published or written by others, nor does it include content that has been submitted for the award of any degree or diploma at any educational institution, except where proper acknowledgment is made in the thesis.



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ABSTRACT

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This research addresses the suboptimal physical availability of the PC2000-8 Super Big Digger at PT ABC, a major mining contractor partnered with PT United Tractors. Despite maintenance contracts, units consistently failed to meet the 92% availability target (actual physical availability average January - June 2024 87,04%), impacting operations and stakeholder confidence. Using the DMAIC (Define, Measure, Analyze, Improve, Control) methodology of Six Sigma, the study analyzes six key maintenance indicators: Periodical Service Achievement, Lead Time Accuracy, Hour Meter Accuracy, Periodical Service Accuracy, Backlog Execution Lead Time, and Start Time Accuracy. Root causes were identified using Fishbone and FMEA tools. High Risk Priority Numbers (RPNs) were found in lubrication, air conditioning, and sensor systems. Improvements included upgrading grease injectors, modifying AC components, and enhancing maintenance coordination. Results showed significant gains in Mean Time to Repair (MTTR) from 4 to 1,69 hours and physical availability from 87,04% to 93,77% in July 2025. The study demonstrates how a structured, data-driven maintenance strategy can improve equipment reliability and sustain operations in the mining industry.

Keywords: DMAIC, Six Sigma, PC2000-8, physical availability, FMEA, preventive maintenance



DEDICATION

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