

INCREASE PHISICAL AVAILABILITY OF KOMATSU DOZZER D65P-12 LGP
USING FMEA AT MINING NICKEL PT XYZ

By

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.



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ABSTRACT

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The Komatsu Dozer D65P-12 LGP at PT XYZ's nickel mining site often failed to reach the 80% physical availability (PA) target due to frequent undercarriage failures. This study aimed to improve the unit's availability using FMEA, supported by DMAIC, Why-Why Analysis, 5W2H, and other reliability tools. The improvement program was carried out in two phases: January–December 2024 and February–May 2025. Main initiatives included mechanical modifications, structured undercarriage inspections, backlog management, and improved preventive maintenance. The results showed strong progress: PA increased from 72% to 85%, backlog completion rose from 19% to 75%, and undercarriage downtime dropped from 82.4% to 58.9%. Specific actions, such as sprocket bolt modifications (reducing failures from 128 to 6) and carrier roller reworks (from 9 to 3), effectively minimized recurring issues. Overall, this study proves that data-driven and failure-focused maintenance can significantly improve equipment availability in mining operations, while also offering useful insights for practitioners and future research.

Keywords: Physical Availability, FMEA, DMAIC, Why-Why Analysis, 5W2H, Dozer D65P-12, Undercarriage, Mining Equipment Maintenance, Weibull Analysis, Preventive Maintenance.



DEDICATION

This thesis is dedicated with deepest gratitude and love to:

My beloved parents,

for their endless support, sacrifices, and prayers that have shaped who I am today. Your unwavering belief in me has been my greatest strength.

My dear wife,

whose patience, understanding, and encouragement have been a constant source of motivation throughout this academic journey. Thank you for standing beside me through every challenge.

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whose smiles and innocence remind me every day of my purpose and inspire me to become a better version of myself.

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