

DEVELOPMENT AND ANALYSIS OF REAL-TIME MONITORING
IMPLEMENTATION OF RETARDER TEMPERATURE USING IOT

By

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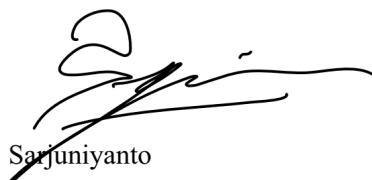


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STATEMENT BY THE AUTHOR

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.



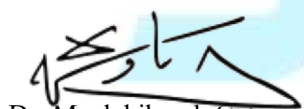
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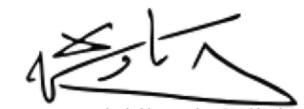
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ABSTRACT

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Continuous improvements are being made to support the reduction of unscheduled breakdowns on the Scania G460. Breakdown due to retarder malfunctions often occurs by 26%, which is the main problem in this study that must be addressed to reduce the biggest pareto problem. The analysis was carried out using the Pareto problem method, fishbone diagrams, regression analysis and supported by experimental studies on Scania G460 sensor equipment so that several improvement recommendations were obtained to reduce retarder damage on the G460. Improvements were made starting from making temperature, pressure and retarder lever and can be seen directly in real time by the operator in the cabin so that retarder damage can be reduced. Good commitment and cooperation from all departments & collaboration with distributors and principals to carry out repair activities are the key to the success of the repair. The results of this repair indicate that retarder damage has been reduced by up to 6.57%. This study succeeded in changing the condition of the retarder temperature, which was often overheated, which was previously shown to be normal with several repair activities carried out. This has an impact on reducing the breakdown of unscheduled Scania hauling equipment from the previous 40.9% to 28.4%, or a decrease of 12.5%.

Keywords: Breakdown Unscheduled, Retarder, Scania G460, Pareto, Fishbone, FMEA (Failure Mode and Effects Analysis), IoT (Internet of Things), Real-time Monitoring, Hydraulic Retarder, Overheating, Temperature Sensor, Arduino Nano, ESP32, LoRa, DIGIMONER (Digital Monitoring Retarder), Predictive Maintenance, RPN (Risk Priority Number), FGD (Focus Group Discussion), DMAIC (Define, Measure, Analyze, Improve, Control), Coal Hauling, Heavy Equipment, Key Performance Indicators



DEDICATION

Alhamdulillah. With deep gratitude, I dedicate this thesis to myself, that other part of me that is always enthusiastic about-facing life's challenges. And especially to:

1. Allah SWT, who has given me the opportunity and ease to complete this thesis on time and has enabled those around me to support my studies.
2. My beloved wife, Fitri Mulyaningsih, and my children, Alifiant Bhadrika Dzakwaan and Afifant Giandra Alfarezqi, who have spent time with me, who have continuously encouraged me during my studies and work, and who continue to pray for the best for me.
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4. Dean of the Faculty of Engineering Management, Swiss German University, Dr. Ir. Maulahikmah Galinium, S.Kom., M.Sc.
5. Thesis advisor Dr. Ir. Maulahikmah Galinium, S.Kom., M.Sc. and Thesis co-advisor Dr. Yunita Umniyati, S.Si., M.Sc., who have generously contributed their time, knowledge, and patience to guide this thesis, ensuring its completion.
6. All lecturers and staff in the Master of Mechanical Engineering Department, Faculty of Engineering Management, Swiss German University.
7. All parties who have assisted the researcher in completing this thesis, who cannot be mentioned individually.

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