

**OPTIMIZING SPARE PARTS BY USING CRITICALITY LEVEL AND
REPLENISHMENT POLICY IN OIL AND GAS INDUSTRY**

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STATEMENT BY 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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Spare part management is a crucial activity in many industries due to the high production loss during downtime caused by a shortage of spare parts. Conversely, a high stock level results in a high value of unproductive capital. This study was conducted in order to reduce spare parts inventory without compromising plant downtime caused by a shortage of spare parts. The DMAIC framework is used to analyze spare parts management problems. This study utilizes the Analytic Hierarchy Process (AHP) to classify spare parts according to their level of criticality. Furthermore, the replenishment policy for each spare part is determined based on the results of the AHP simulation. Proper implementation of this study result can identify the status of spare parts movement and has the potential to reduce inventory value by 25%.

Keywords: Criticality Level, Optimizing Spare parts, Replenishment Policy, ABC Analysis, VED Analysis, AHP Analysis

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DEDICATION

I dedicate this thesis to my family, my advisor and co-advisor, my lecturers and my classmates who shared their words of advice and encouragement to finish this study.

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