

CHAPTER 1 - INTRODUCTION

1.1 Background

1.1.1 Site Overview

Global coal demand continues to increase in line with world economic growth. According to a report from the International Energy Agency (IEA, 2023), global coal demand in 2023 is expected to reach 7.4 billion tons, up 2.6% from the previous year. The increase in coal demand is mainly driven by economic growth in Asia, especially China and India.

In Indonesia, the need for coal also continues to increase along with the growth of industry and steam power plants (PLTU). According to data from the Ministry of Energy and Mineral Resources (ESDM) (MODI, 2023), national coal production during the January-June 2023 period reached 359.42 million tons, up 5% from the previous year.

This increase in coal demand also has an impact on increasing coal production in South Sumatra. South Sumatra is one of the largest coal producing provinces in Indonesia. In 2023, it is estimated that coal production in South Sumatra will reach 100 million tons, up 10% from the previous year. The target is mostly contributed by state-owned companies operating in Tanjung Enim with a production target in 2023 to reach 40% of the coal production target in South Sumatra.

From the explanation above, it can be concluded that the coal mining industry is an important component of the global and national economy, providing energy for power plants, steel production and other important industries. However, the industry faces challenges in maintaining the high performance and reliability of its equipment, especially heavy-duty haul trucks. Transport trucks are an important asset in coal mining, tasked with transporting large quantities of coal from the excavation site to the

processing plant. A dump truck failure can cause significant disruption to mining operations, resulting in production losses and increased costs.

1.1.2 Research Background

As one of the leading companies in the construction and mining industry in Indonesia, PT. United Tractors Tbk. plays an important role in providing heavy equipment to various customers in various sectors. With a commitment to providing optimal product support, PT. United Tractors develops Product Support and After Sales which is tasked with ensuring the smooth operation and maintenance of customer equipment.

One of the strategic initiatives successfully implemented by PT. United Tractors is a Maintenance Contract (MC). MC is a form of comprehensive maintenance agreement that allows customers in the construction and mining sectors to completely transfer responsibility for the maintenance, repair and upkeep of their heavy equipment to a leading service provider such as PT. United Tractor. Within the FMC framework, PT. United Tractors takes over all aspects of maintenance, including planning routine maintenance, repairs and providing necessary spare parts.

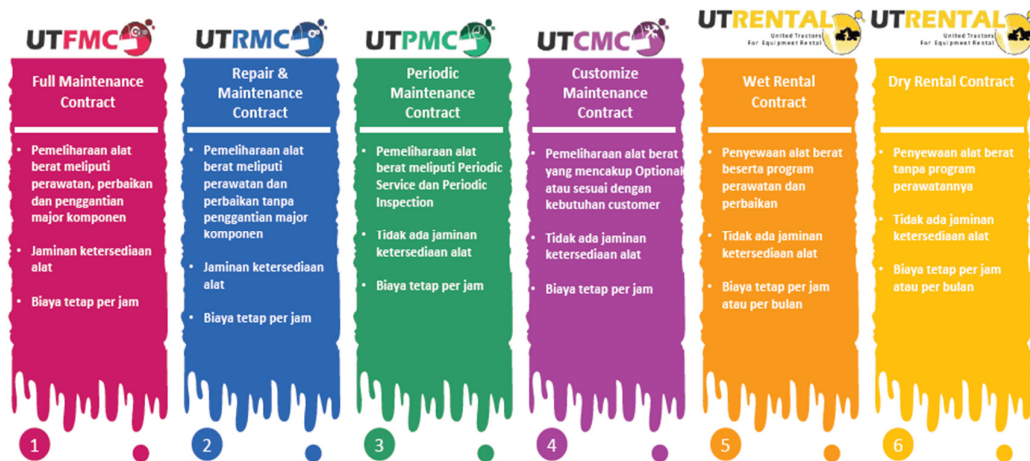


Figure 1.1. Maintenance Contract & Rental Scheme (internal document)

MC is not just systematic maintenance management but also serves as a business solution that allows customers to focus more on their core business. By entrusting the maintenance aspect to PT. United Tractors, customers can free up their internal

resources from time-consuming, complex, and high-risk maintenance tasks. This allows them to allocate their time, energy, and financial resources to their key operations, increasing productivity, efficiency, and focusing on achieving long-term business goals.

Table 1.1. Matric of Maintenance Contract

Contract Type	Coverage	Guarantee	Cost
Full Maintenance Contract (UTFMC)	Maintenance, repair and replacement of major components	Equipment availability	High
Repair & Maintenance Contract (UTRMC)	Maintenance and repair	Availability of equipment (for damage caused by normal use)	Moderate
Periodic Maintenance Contract (UTPMC)	Periodic maintenance	None	Low
Customized Maintenance Contract (UTC MC)	As per customer's requirement	As per customer's requirement	As per customer's requirement

Since its introduction in 2004, the Maintenance Contract & Rental initiative has significantly increased the number of units involved in maintenance and rental contracts. The population of the units involved has grown over time, and the variety has become more diverse. This population involves various types of equipment used in various industrial sectors, such as the forestry sector, construction, logging transportation, to the mining sector. This diversification reflects the success of this initiative in reaching diverse customers and industry sectors and is proof that the concept of Maintenance Contract & Rental product has become a highly relevant and effective solution in supporting the operational success of various types of companies and projects across the region.

One of the most dominant units in contract maintenance is HD785-7 where the overall population reaches 24% of the entire population of contract maintenance and rental units. This is what ultimately became a concert in this study.



FMC is a maintenance package that covers all aspects of maintenance, including repairs, component replacements, and inspections. FMC offers 24-hour service to ensure equipment continues to operate optimally. FMC has several key performance indicators (KPIs) to achieve, including:

- In addition to KPIs, FMC also has several performance parameters that are used to measure customer satisfaction. These parameters are:

- PS Achievement, which is the percentage of achievement of the PS target
- PS Accuracy, namely the accuracy of PS in accordance with predetermined procedures, specifically +/- 50 hours from the schedule
- Accuracy Unit, that is, the accuracy of the PS on the specified unit
- PS Lead Time Accuracy, which is the timeliness of PS according to a predetermined schedule
- PS Start Time Accuracy, which is the timeliness of the start of PS according to a predetermined schedule
- Overall PS Performance, which is the overall performance of PS

Currently, customers are not satisfied with FMC's performance against HD785-7 units. This is due to the poor performance of SF implementation in the last 6 months until June 2023. Prolonged PS implementation can interfere with equipment productivity.

Table 1.2. Achievement of Six Performance Parameter as of June 2023

Performance	Target (%)	Achievement (%)					
		Jan	Feb	Mar	Apr	May	Jun
PS Achievement	90	100	100	100	100	100	97,1
PS Accuracy ($\pm$ 50h)	90	100	100	100	100	97,1	88,2
PS Unit Accuracy	90	75	100	100	100	100	97,1
PS Leadtime Accuracy	90	75	61,5	62,5	85,7	79,4	65,4
PS Start Time Accuracy	90	100	100	100	97,6	100	97,6
PS Quality	83,9	90,1	88,3	88,9	87,0	91,7	83,9

Table 1.2. above shows that PS Leadtime accuracy at first half of 2023 is not achieved according to the target. This can lead to damage to the operation plan of the equipment, on the other hand it can also lead to a decrease PA of the equipment.

From these data, the UT FMC's predict that the low achievement of PS Lead Time Accuracy is caused by poor PS planning and not conducting analysis from periodical inspection reports and other data obtained from equipment health measurements, therefore UT FMC Tanjung Enim has decided to implement a maintenance management portal (MMP) to improve maintenance planning and automatic unit health analysis so that in the end it can reduce duration PS and improve PS Leadtime accuracy.

MMP is a fairly simple form of computerized maintenance management (CMMS). The idea is to collect all sensor outputs in the pliers unit integrated in the vehicle health monitoring system (VHMS) that has been embedded in each Komatsu unit including the HD785-7. The goal is to get excellence in maintenance so that there will be a balance between maintenance performance and the costs incurred.

However, the extent of the effectiveness of the MMP application has not been further analyzed so that research is needed to analyze the effectiveness of the use of MMP in supporting the performance of FMC units in Tanjung Enim.

1.2 Objectives

Based on the data achievement of Six Performance Parameter as of June 2023, the average PS lead time accuracy is only 71.19%. This can have a negative impact on customer satisfaction and FMC performance.

The objective of this research is to analyze the causes of the unachieved PS Leadtime accuracy and improve PS Leadtime accuracy using Maintenance Management Portal (MMP).

1.3 Significant of Study

Accurate and timely completion of regular servicing is critical to maintaining operational efficiency and equipment reliability in a variety of industries. However, many organizations or companies struggle with inaccurate lead time estimates, resulting in service delays, increased costs, and potential equipment failure.

Implementing a Maintenance Management Portal (MMP) offers a promising path to address these challenges. MMP provides a centralized platform for managing all aspects of maintenance, including scheduling, work orders, maintenance strategy reference (MSR), and Preventive and Corrective Action Request (PCAR). Although the potential benefits of MMP are known, empirical evidence regarding its impact on improving service wait time accuracy is periodic still unknown. Tabel 3. Significant of study

This research aims to address this gap by investigating the impact of implementing MMP on Periodical Service (PS) Leadtime accuracy in the coal mining sector, especially for the Komatsu HD785-7 unit at FMC Tanjung Enim. By analyzing data before and after implementation, this research will assess whether MMP can effectively improve lead time accuracy and provide overall positive results for the company.

Potential Contribution:

- Providing empirical evidence: This research will offer valuable empirical evidence regarding the effectiveness of MMPs in improving the accuracy of periodic service wait times, contributing to knowledge in maintenance management research.

- Inform industry practice: The findings of this research can inform industry practice by providing practical insights on how to effectively utilize MMPs to improve operational efficiency and service quality.
- Benefits for companies: By demonstrating the potential benefits of MMPs in terms of improving lead time accuracy, this research may encourage companies to consider implementing this technology, leading to improved service delivery and cost savings.
- Guiding future research: This research may pave the way for future research investigating the broader impact of MMPs on various aspects of maintenance management.

1.4 Research Question

The following are some of the questions that came up in this study.

1. How does the implementation of the Maintenance Management Portal (MMP) affect Periodical Service (PS) Leadtime accuracy?
2. How does the implementation of Maintenance Management Portal (MMP) affect overall maintenance effectiveness?
3. What is the impact of MMP implementation on FMC Business?

1.5 Hypothesis

Implementation of Maintenance Management Portal (MMP) will improve PS lead time accuracy.