WORKLOAD ANALYSIS OF SUPERVISORY LEVEL at PT. XYZ USING FULL-TIME EQUIVALENT METHOD

UNDERGRADUATE THESIS

Submitted to the International Undergraduate Program in Industrial Engineering in Partial Fulfillment of Requirement for the Degree of Sarjana Teknik at the Faculty of Industrial Technology
Universitas Islam Indonesia

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YOGYAKARTA
2025

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Yogyakarta, October 7th, 2025



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Demikian surat keterangan ini kami buat, agar dapat dipergunakan sebagaimana mestinya.

Wassalamu'alaikum warahmatullahi wabarakatuh

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DEDICATION PAGE

This undergraduate thesis is dedicated to myself. I would like to express my deepest gratitude to everyone who has contributed to its completion, especially those who have devoted their energy, time, and resources to support me throughout this process. Every form of support has been truly invaluable. Allah rewards you all with Jannah. A special appreciation goes to my parents and my brother, whose constant inquiries about my thesis served as a motivation that strengthened my resolve to complete this work.

MOTTO

"If you do good, you do good for yourselves; and if you do evil, you do it to yourselves."
(Al-Isra [17]: 7)

"The best of people are those who are most beneficial to others."
(HR. Ahmad, ath-Thabrani, ad-Daruqutni)

"♪My back taught me that everyone runs at a different pace♪"

PREFACE

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ABSTRACT

This study aims to analyze the workload of supervisory-level employees at PT. XYZ, a coal hauling company, uses the Full Time Equivalent (FTE) method. Excessive workload among supervisors has been identified as a critical issue leading to long processing times, decreased performance, and operational incidents that caused production stoppages and financial losses. The research was conducted through observation, interviews, and data collection regarding working hours, allowance, and job activities. Based on the FTE results, several supervisory positions were found to be in the overload category, indicating that the current number of supervisors is insufficient to meet operational demands. To identify the underlying causes of this condition, a Root Cause Analysis (RCA) was performed using the Fishbone Diagram, which revealed key contributing factors including skill gaps among supervisors, manual and non-digital work systems, unreliable tools, and an insufficient number of supervisors. To address these issues, several solutions are proposed: conducting targeted training and mentoring programs to improve supervisor competence, implementing digital reporting and scheduling systems to increase efficiency, upgrading technological tools and ensuring their reliability, and hiring additional supervisors to balance the workload. These actions are expected to reduce excessive workload, improve operational efficiency, and minimize the risk of incidents due to fatigue or mismanagement. Ultimately, this research provides practical recommendations for optimizing manpower planning and enhancing supervisory performance at PT. XYZ by adding 6 new supervisors.

Keywords: Workload Analysis, Full Time Equivalent (FTE), Mining Industry, Hauling Company

TABLE OF CONTENTS

AUTHENTICITY STATEMENT ..... **i**
RESEARCH COMPLETION LETTER ..... **ii**
SUPERVISOR APPROVAL SHEET ..... **iii**
EXAMINERS' APPROVAL PAGE ..... **iv**
DEDICATION PAGE ..... **v**
MOTTO ..... **vi**
PREFACE ..... **vii**
ABSTRACT ..... **viii**
TABLE OF CONTENTS ..... **ix**
LIST OF TABLES ..... **xi**
LIST OF FIGURES ..... **xiii**
CHAPTER I INTRODUCTION **1**
1.1 Background 1
1.2 Problem Formulation 3
1.3 Research Objectives 4
1.4 Benefits of research 4
1.5 Research Limitations 4
1.6 Systematic research 5
CHAPTER II LITERATURE REVIEW **6**
2.1 Literature Review 6
2.2 Theoretical basis 9
2.2.1 Workload 9
2.2.2 Workload Analysis 9
2.2.3 Manpower Planning 9
2.2.4 Full Time Equivalent 10
2.2.5 Allowance 11
2.2.6 Fishbone Diagram 13
CHAPTER III RESEARCH METHODOLOGY **15**
3.1 Research Subject 15
3.2 Research Object 15
3.3 Data Collection Method 15
3.4 Research Flow 16
3.5 Research Framework 18
CHAPTER IV DATA COLLECTION AND DATA PROCESSING **20**
4.1 Data Collection 20
4.1.1 Working Hours 20
4.1.2 Cycle Time 20
4.1.3 Allowance 36
4.2 Data Processing 37
4.2.1 Standard Time 37
4.2.2 Full Time Equivalent 53
4.2.3 Manpower Need 69

4.2.4 Fishbone Diagram 73
CHAPTER V DISCUSSION 74
5.1 Full-Time Equivalent analysis 74
5.1.1 Allowance 74
5.1.2 FTE Index 74
5.2 Fishbone Diagram Analysis 75
5.2.1 People 75
5.2.2 Methods 77
5.2.3 Machines / Tools 78
5.2.4 Management 79
CHAPTER VI CONCLUSION AND RECOMMENDATION 81
6.1 Conclusion 81
6.2 Suggestions 82
BIBLIOGRAPHY 83
APPENDIX I-1

LIST OF TABLES

Table 2. 1 Allowance Table 11
Table 4.1 Human Capital Officer Cycle Time 21
Table 4.2 General Service Cycle Time 23
Table 4.3 Community Development Officer Cycle Time 24
Table 4.4 Plant People Development Cycle Time 25
Table 4.5 Plant Hauling GL Cycle Time 26
Table 4.6 Plant Engineer Cycle Time 26
Table 4.7 Tire GL Cycle Time 27
Table 4.8 Planner Cycle Time 27
Table 4.9 SSE GL Cycle Time 28
Table 4.10 Warehouse GL Cycle Time 29
Table 4.11 Inventory & Purchasing GL Cycle Time 29
Table 4.12 Mine Infrastructure Engineer Cycle Time 30
Table 4.13 Data Analyst Cycle Time 32
Table 4.14 Road Maintenance GL Cycle Time 32
Table 4.15 Hauling GL Cycle Time 33
Table 4.16 Operation Site Instructor Cycle Time 34
Table 4.17 SHE Site Leader Cycle Time 35
Table 4.18 ICT Officer Cycle Time 36
Table 4.19 Allowance Office 36
Table 4.20 Allowance Field 37
Table 4.21 Human Capital Officer Standard Time 37
Table 4.22 General Service Standard Time 39
Table 4.23 Community Development Officer Standard Time 41
Table 4.24 Plant People Development Standard Time 42
Table 4.25 Plant Hauling GL Standard Time 43
Table 4.26 Plant Engineer Standard Time 43
Table 4.27 Tire GL Standard Time 44
Table 4.28 Planner Standard Time 44
Table 4.29 SSE GL Standard Time 45
Table 4.30 Warehouse GL Standard Time 45
Table 4.31 Inventory & Purchasing GL Standard Time 46
Table 4.32 Mine Infrastructure Engineer Standard Time 47
Table 4.33 Data Analyst Standard Time 48
Table 4.34 Road Maintenance GL Standard Time 49
Table 4.35 Hauling GL Standard Time 50
Table 4.36 Operation Site Instructor Standard Time 51
Table 4.37 SHE Site Leader Standard Time 51
Table 4.38 ICT Officer Standard Time 52
Table 4.39 Human Capital Officer FTE Index 53
Table 4.40 General Service FTE Index 55
Table 4.41 Community Development Officer FTE Index 57

Table 4.42 Plant People Development FTE Index 58
Table 4.43 Plant Hauling GL FTE Index 59
Table 4.44 Plant Engineer FTE Index 59
Table 4.45 Tire GL FTE Index 60
Table 4.46 Planner FTE Index 60
Table 4.47 SSE GL FTE Index 61
Table 4.48 Warehouse GL FTE Index 62
Table 4.49 Inventory & Purchasing GL FTE Index 62
Table 4.50 Mine Infrastructure Engineer FTE Index 64
Table 4.51 Data Analyst FTE Index 65
Table 4.52 Road Maintenance GL FTE Index 65
Table 4.53 Hauling GL FTE Index 67
Table 4.54 Operation Site Instructor FTE Index 67
Table 4.55 SHE Site Leader FTE Index 68
Table 4.56 ICT Officer FTE Index 69
Table 4.57 FTE Index Summary 69
Table 4.58 Proposed FTE Index 70
Table 4.59 FTE Index for each Department 71
Table 4.60 Manpower Need for each Department 72

LIST OF FIGURES

Figure 3.1 Research Flow.....16
Figure 3.2 Research Framework 19
Figure 4.1 Fishbone Diagram……..73

CHAPTER I
INTRODUCTION

1.1 Background

The coal mining industry is a strategic sector that supports Indonesia's economy, particularly through its contribution to exports and domestic energy supply. As demand for coal continues to rise in both national and international markets, companies in this industry are required to improve productivity and operational efficiency. One critical component in the coal production chain is the hauling process, which involves transporting coal from mining sites to storage facilities or ports. The hauling process not only ensures smooth distribution but also directly impacts a company's operational costs.

PT XYZ Jobsite A is a company specializing in coal hauling services. As part of an integrated mining business group, PT XYZ plays a vital role in ensuring the smooth transportation of coal. The main challenges faced by hauling companies like PT XYZ include effectively and efficiently managing vehicle fleets, minimizing travel time, optimizing fuel usage, and maintaining the safety and quality of coal during transportation.

In an increasingly competitive industrial environment, adopting modern technology and management methods has become essential. This includes logistics management, fleet management, and the use of information technology for monitoring and controlling operations. The optimization of the hauling process aims not only to enhance productivity but also to reduce costs and minimize environmental impact.

The coal hauling industry plays a vital role in the supply chain of the mining sector, serving as a crucial link between mining sites and ports or other distribution facilities. Hauling activities encompass various operational components, including material transportation using heavy equipment, logistics coordination, and workforce management. In this context, effective workforce management becomes a key factor in determining operational efficiency and overall company success.

However, challenges in workload management in coal hauling companies often arise due to fluctuating workloads. These fluctuations are influenced by changes in production volume, transportation distances, road conditions, and weather. Such variability can lead to

imbalances between workforce demand and availability. If workload management is inadequate, companies may face risks such as overstaffing, resulting in unnecessary labor costs, or understaffing, which can lower productivity and affect service quality. Workload is the amount of effort required to fulfill the total demand for tasks assigned to the workforce, and it is a measure of the workforce's restricted ability to do specific jobs. According to ergonomics, the workload received by the human body must be adequate or balanced based on its aptitude or physical ability, cognitive capacities, and restrictions (Nuraismi et al., 2023).

In coal hauling operations, maintaining continuous and efficient activity is critical to ensuring the company's financial performance. Any disruption, particularly due to operational incidents, can result in significant financial losses. At PT. XYZ, coal hauling activities must be halted immediately when an incident occurs to ensure safety and compliance with standard operating procedures. Based on company data, the estimated revenue generated from daily hauling operations is approximately IDR 2.4 billion. Therefore, even a single day of halted operations represents a substantial loss. Alarmingly, incident records from the previous year indicate that two operational stoppages were directly linked to issues at the supervisory level. These findings highlight the crucial role that supervisors play in maintaining operational safety and performance. As such, understanding and evaluating the workload of supervisory personnel becomes essential to prevent future incidents, ensurie optimal staffing, and sustain operational continuity. This study seeks to analyze the workload of the supervisory level using the Full Time Equivalent (FTE) method to support better manpower planning and improve overall operational reliability.

To meet the objective, the accuracy of the number of personnel engaged in an organizational system is a fundamental need that must be addressed while developing work plans(Mazitah et al., 2023). To address these challenges, an accurate and reliable workload analysis method is required. One of the most relevant methods is Full Time Equivalent (FTE). FTE is the number of hours of work of full-time or full-time workers within a specific period of time, such as a month or a year. (Dahlan et al., 2021).

The FTE method enables the measurement of workforce requirements based on the amount of full-time work needed to complete specific tasks. This approach allows companies to calculate the ideal number of employees required for each department or work process, enabling efficient workforce allocation.

In coal hauling companies, applying workload analysis using the FTE method has significant potential to enhance operational efficiency. Moreover, this method helps companies identify areas needing workforce adjustments, optimize work schedules, and reduce potential losses caused by workforce imbalances. Therefore, this study focuses on workload analysis using the FTE method to provide recommendations that support more effective workforce management.

The use of the Fishbone Diagram in this research is essential to identify and analyze the root causes of excessive workload experienced by supervisory-level employees at PT. XYZ. While the Full Time Equivalent (FTE) method quantitatively measures the level of workload and identifies whether manpower is sufficient, it does not explain *why* the overload occurs. Therefore, the Fishbone Diagram complements the FTE analysis by providing a structured and visual approach to explore the underlying factors contributing to workload imbalance. Through categorization into aspects such as Man, Methods, Machines, Management, and Material, the Fishbone Diagram helps reveal deeper issues like skill gaps, insufficient supervision, manual reporting systems, and inadequate digitalization. Understanding these root causes is crucial for developing effective solutions and recommendations in manpower planning, ensuring that staffing adjustments are not only based on workload quantity but also address the systemic and procedural problems that lead to inefficiency and overburdened supervisors.

1.2 Problem Formulation

The problem formulation is a clear description of the issue that is required to be resolved or improved through research, in which the problem formulation is a continuation of the problem background. The following are the problem formulations:

1. What is the workload level of the supervisory employees at PT. XYZ based on the Full-Time Equivalent (FTE) method?
2. What is the cause of the workload conditions of the supervisory level at PT. XYZ?

1.3 Research Objectives

The research objective answers the research question:

1. To determine the workload level of supervisory employees at PT. XYZ by using the Full-Time Equivalent (FTE) method.
2. To find the cause of the workload conditions of the supervisory level at PT. XYZ.

1.4 Benefits of research

The outcomes of this research provide benefits for the researcher, the company, and the university, as follows:

1. For the Researcher:
   a. Serves as an opportunity to apply theoretical knowledge and skills acquired during university studies.
   b. Offers firsthand experience in conducting research within a company setting, specifically at PT. XYZ.
2. For the University:
   a. Enables the university to assess student performance based on the research outcomes and evaluation results.
   b. Strengthens partnerships with the company through internship programs and collaborative research initiatives.
3. For the Company:
   a. Provides valuable insights and recommendations from the researcher on specific areas within the organization.
   b. Supports improvements based on the proposed recommendations.

1.5 Research Limitations

There are some limitations of the research:

1. Data was collected in PT. XYZ Jobsite A at the Supervisory level.
2. The research was conducted from November 8 until December 27, 2024.

1.6 Systematic research

The research is structured into several chapters, and each chapter will be described as follows:

CHAPTER 1 INTRODUCTION

This section describes the discussion in Chapter I.

CHAPTER II LITERATURE REVIEW

This section describes the discussion that existed in Chapter II.

CHAPTER III RESEARCH METHODOLOGY

This section describes the discussion elaborated in Chapter III.

CHAPTER IV DATA PROCESSING AND RESEARCH RESULTS or SYSTEM DEVELOPMENT

This section describes the discussion in Chapter IV.

CHAPTER V DISCUSSION or SYSTEM TESTING AND DISCUSSION

This section describes the discussion in Chapter V.

CHAPTER VI CONCLUSIONS AND RECOMMENDATIONS

This section elaborates the discussion in Chapter VI related to conclusions and suggestions.

BIBLIOGRAPHY

APPENDIX

CHAPTER II
LITERATURE REVIEW

2.1 Literature Review

Workload analysis is one of the critical tools in industrial engineering to evaluate whether a given workforce size matches the operational demands of a company. Supervisory-level employees, who are responsible for coordinating, monitoring, and evaluating daily activities, often experience fluctuating workloads depending on operational changes, administrative tasks, and unexpected disruptions. Several recent studies emphasize the importance of measuring workload accurately to ensure employee effectiveness and operational efficiency. Chen et al. (2022) found that high workloads without proper compensation or job satisfaction could lead to unsafe behavior in high-risk environments such as mining. This indicates the importance of quantifying workload to preserve not only productivity but also worker safety and health.

The Full Time Equivalent (FTE) method has gained popularity as a standardized and quantitative approach to workload analysis. The FTE method allows organizations to translate task volumes into full-time employee units, helping management make data-driven decisions regarding optimal staffing. According to Mazitah et al. (2023), implementing FTE in the production division of a shipbuilding company revealed understaffing conditions and helped realign task distributions. The strength of the FTE method lies in its ability to accommodate diverse, non-repetitive tasks, making it especially suitable for supervisory-level roles where job scope often blends operational oversight with administrative duties.

For supervisory tasks, time measurement methods such as observation, task recording, or work sampling are typically used to gather data before calculating FTE. Kabul & Febrianto (2022) explain that a detailed breakdown of time allocation per task is essential for determining whether workers are performing at full capacity or being underutilized. In their study, the FTE method revealed significant inefficiencies caused by unclear task boundaries and overlapping responsibilities. Similarly, Rahmi & Suhada (2024) applied FTE to a quality control department and found that many non-core activities burdened supervisors, reducing their availability for essential oversight functions.

Several studies have also linked excessive mental workload with diminished work performance, especially in critical industries like mining and manufacturing. Jame Chenarboo et al. (2022) examined both physical and mental workload and their impact on employee safety behaviour, showing that high task complexity combined with limited recovery time contributes to decreased job performance and increased risk. Meanwhile, Mohammadian et al. (2022) specifically studied mining control room operators and concluded that cognitive demands and poor workload balance significantly affect operational accuracy. These findings support the need to evaluate not just task duration, but also the mental intensity and frequency of interruptions that typically occur in supervisory roles.

In the context of Indonesian industries, workload analysis using the FTE method has also been applied successfully in various operational settings. Dahlan et al. (2021) used the FTE method to determine the optimal number of employees at PT. XYZ, concluding that mismatches between workforce size and job demand caused workflow delays and job stress. Likewise, Wahyulistiani et al. (2022) implemented FTE in a soap production company to identify optimal labour numbers and streamline processes. Their findings suggest that a structured workload analysis can provide concrete inputs for workforce optimization and improved role clarity.

For PT. XYZ, the supervisory level plays a crucial role in maintaining operational flow, ensuring safety compliance, and reporting to upper management. However, supervisors often face overlapping job responsibilities, unplanned tasks, and a lack of support personnel, resulting in excessive workload. As noted by Widyaningrum et al. (2023), using the FTE method in a quality control department revealed that supervisory staff were consistently over capacity, resulting in high stress levels and reduced decision-making quality. By applying the FTE method in this study, the actual workload of supervisors at PT. XYZ will be quantitatively assessed, enabling the company to make informed decisions regarding staffing adjustments, task reallocation, and process redesign.

Table 2. 1 Research Gap

Author	Hauling Industry	Mining Industry	Workload	FTE	Manpower planning	Fishbone Analysis
(Ali et al., 2022)			√			

Author	Hauling Industry	Mining Industry	Workload	FTE	Manpower planning	Fishbone Analysis
(Chen et al., 2022)		√	√			
(Dahlan et al., 2021)				√	√	
(Feng & Ren, 2021)		√	√			
(Ardha et al., 2023)						√
(Kabul & Febrianto, 2022)		√			√	
(Kurniawan & Karmelia Shaura, 2022)			√	√	√	
(Ma'rifah et al., 2024)			√	√	√	
(Mazitah et al., 2023)			√	√		
(Mohammadian et al., 2022)		√	√			
(Nurahma et al., 2022)	√	√	√			
(Paulus Belan Beribe et al., n.d.)		√				
(Rahmi & Suhada, 2024)			√	√	√	
(Holifahtus Sakdiyah et al., 2022)		√				√
(Wahyulistiani et al., 2022)			√	√	√	
(Widyaningrum et al., 2023)			√	√		
Proposed	√	√	√	√	√	√

2.2 Theoretical basis

The theoretical basis contains terms, theories, or formulas related to the research topic. The theoretical basis is prepared based on reputable journals and/or books.

2.2.1 Workload

Workload refers to a set or number of tasks that must be completed by an organizational unit within a specified period. The excessive number of duties and responsibilities assigned to an employee can result in suboptimal performance, as employees have limited time to complete numerous tasks. If this situation occurs frequently, it will eventually impact the employee's overall performance(Nabila & Syarvina, 2022). Workload refers to several activities that require specific skills and must be completed within a certain timeframe, involving both physical and psychological effort. According to Ali et al. 2022, workload is the comparison between an employee's capability and job demands. If an employee's capability exceeds job demands, it may lead to boredom. Conversely, if the employee's capability is lower than the job demands, it may result in increased feelings of fatigue.

2.2.2 Workload Analysis

To understand these needs and promote safe behavior, it is necessary to pay attention to the workload imposed on workers(Jame Chenarboo et al., 2022b). Workload management must seek to minimize the discrepancy between assigned workloads and the capacity of the assignee so that the assignee will not be overwhelmed by the workload. To this end, the main objective of workload management is to minimize workload imbalance in organizations(Inegbedion et al., 2020). According to Maryadi et al., 2023, workload analysis is intended to balance the workload percentage to an optimal range, ensuring operational efficiency and preventing overload situations.

2.2.3 Manpower Planning

One fundamental requirement that must be taken into account when creating work plans is figuring out the ideal staffing level for a business. In order to assist employee performance in doing their jobs as best they can, the work design process eventually

seeks to balance both the mental and physical components of people in accomplishing certain activities. This is done by determining the number of staff members with the current workload. (Dahlan et al., 2021). A component of manpower planning is the analysis of staff requirements. Organizations employ human resource planning, a conventional human resource management activity, to make sure they have the appropriate number and kind of human resources, increasing the likelihood that they will complete tasks at the appropriate time and location to achieve business goals. Businesses may prevent employment vacancies in the present and the future by practicing effective human resource planning(Kabul & Febrianto, 2022).

2.2.4 Full Time Equivalent

The Full Time Equivalent approach is used to calculate the time needed to accomplish a task. This will be translated to the FTE value, allowing the appropriate number of workers to be established (Wahyulistiani et al., 2022). FTE is the total number of individuals necessary to complete an activity in a system/process at a specific time/period. Employees are assigned to full-time, part-time, and short-hour positions. FTE is a measuring unit that corresponds to one person from a single work unit and can be used in a variety of scenarios. FTE is often used to quantify employees' workloads (Hanjani & Singgih, 2019). The Full-Time Equivalent (FTE) index is categorized into three levels: underload, normal, and overload. These insights provide strategic guidance for workforce planning, improve operational productivity, and help manage labor costs effectively (Rachmuddin et al., 2021). An FTE index value greater than 1.28 indicates an overload condition, while a value between 1.00 and 1.28 is considered normal. Conversely, a value ranging from 0.00 to 0.99 reflects an underload condition. The FTE value for a specific work process can be determined using the following formula:

$$FTE\ Index = \frac{Working\ Time\ \times \frac{100}{(100 - Allowance)}}{Effective\ Working\ Hours}$$

2.2.5 Allowance

Allowances are additional time added to normal time to account for unavoidable and legitimate interruptions, such as fatigue, personal needs, and delays. These components ensure that standard time calculations reflect realistic working conditions. Mazitah et al. (2023) describe allowances as essential in accommodating rest periods, machine adjustments, or non-productive activities. In their study at PT. Indonesian Ship Industry, allowances were applied after calculating the normal time, supporting the development of a more accurate standard time and reliable FTE estimation.

Similarly, (Nurahma et al., 2022) demonstrated the importance of including rest and fatigue allowances in mining environments, particularly for haul truck operators exposed to long shifts and mental fatigue. Their findings show that failure to include adequate allowances could result in underestimating the required workforce, leading to overload and potential safety risks. This reinforces the principle that allowances are not a buffer for inefficiency but a necessary inclusion to maintain health, safety, and performance.

Table 2. 2 Allowance Table

A.	Constant allowances:	Allowance
	1. Personal allowance	5
	2. Basic fatigue allowance	4
B.	Variable allowances:	
	1. Standing allowance	2
	2. Abnormal position allowance:	
	a. Slightly awkward	0
	b. Awkward (bending)	2
	c. Very awkward (lying, stretching)	7
	3. Use of force, or muscular energy (lifting, pulling, or pushing): Weight lifted, pounds:	
	5	0
	10	1
	15	2

20	3
25	4
30	5
35	7
40	9
45	11
50	13
60	17
70	22

4. Bad light:
    a. Slightly below recommended 0
    b. Well below 2
    c. Quite inadequate 5
5. Atmospheric conditions 0-100
6. Close attention:
    a. Fairly fine work 0
    b. Fine or exacting 2
    c. Very fine or very exacting 5
7. Noise level:
    a. Continuous 0
    b. Intermittent - loud 2
    c. Intermittent – very loud 5
    d. High – pitched – loud 5
8. Mental strain:
    a. Fairly complex process 1
    b. Complex or wide span of attention 4
    c. Very complex 8
9. Monotony:
    a. Low 0
    b. Medium 1

c. High	4
10. tediousness	
a. Rather tedious	0
b. Tedious	2
c. Very tedious	5

2.2.6 Fishbone Diagram

A fishbone diagram is an instrument for determining potential inputs for a certain output, such as variations or results. This diagram is sometimes referred to as an Ishikawa diagram or a cause-and-effect diagram. The Japanese quality control expert Kaoru Ishikawa, who invented the usage of this diagram in the early 1960s, is honoured by the name. The skeleton of a fish is used to symbolize the underlying source of issues, while the head of the fish is used to illustrate its impact or output. This forms the fundamental framework of the graphic(Ardha et al., 2023).

Holifahtus Sakdiyah et al. (2022) stated that once the research is established, it is critical to identify the root cause of the issue. Root Cause Analysis is one method that may be applied. To determine the problem's underlying source, this study looks at a few of the current root causes. Several widely used tools, such as cause-and-effect diagrams (Ishikawa) or fishbones, may integrate and represent organizational or business difficulties in terms of people, tools, customers, business processes, etc.

The Fishbone Diagram is an essential analytical tool in this research as it helps systematically identify and visualize the root causes of excessive workload among supervisory-level employees at PT. XYZ. As explained by Ardha et al. (2023), this diagram illustrates the relationship between a problem and its potential causes, enabling a structured examination of complex issues. In this study, it is used to categorize the sources of excessive workload into key factors such as human, methods, tools, management, and workload demand. According to Holifahtus Sakdiyah et al. (2022), determining the root cause is vital to ensure that corrective actions address the fundamental issues rather than just the symptoms. Through this approach, the Fishbone Diagram allows researchers to identify specific problem areas,

such as skill gaps, lack of digitalization, and insufficient manpower, and develop effective, targeted solutions. So, it serves as a crucial foundation for understanding the root problems and formulating strategic recommendations to optimize workload and enhance supervisory performance at PT. XYZ.

CHAPTER III
RESEARCH METHODOLOGY

3.1 Research Subject

This research was conducted in the is a company in the mining hauling industry, namely PT. XYZ. PT. XYZ is in Central Kalimantan. This research focused on the workers of PT. XYZ at a supervisory level.

3.2 Research Object

The object of this study is the working hours of each worker at their respective workstations. This study will calculate the workload and determine the optimal number of workers using the Full Time Equivalent method.

3.3 Data Collection Method

The data of this research were collected by two methods, which are:

1. Primary Data

   Primary data of this research were collected by direct interview with the supervisor of PT. KPP Jobsite A

2. Secondary Data

   The secondary data of this research was collected from the management.

3.4 Research Flow

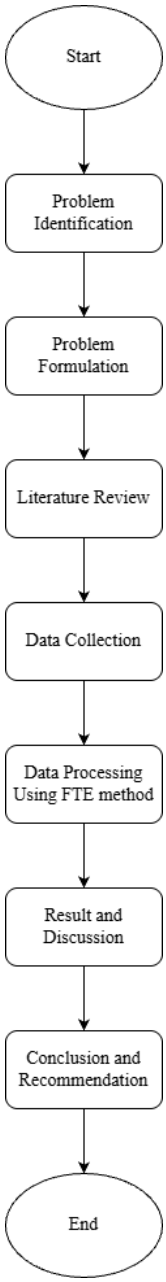


Figure 3.1 Research Flow

The description of each step in the flowchart:

1. Start

   This step where the research was started

2. Problem Identification

In this stage, the researcher observes existing conditions in the company to identify potential problems related to human resource allocation, especially at the supervisory level. Common issues may include excessive workloads, unclear task distributions, or inefficiencies due to overstaffing or understaffing. Identifying these problems is essential to justify the need for a workload analysis that leads to optimal workforce planning.

3. Problem Formulation

   Once the problems have been identified, the next step is to formulate clear and concise research questions that will guide the study. The problem formulation defines the scope and objectives of the research. For example, the study may seek to answer whether the current number of supervisors is adequate based on actual workloads, and how many Full Time Equivalent (FTE) employees are ideally required to handle the tasks efficiently.

4. Literature Review

   This stage involves reviewing relevant theories, concepts, and previous research related to workload, workload analysis, manpower planning, and the Full Time Equivalent method. The literature review helps establish a strong theoretical foundation for the study and supports the selection of the FTE method as a reliable approach for measuring workload and determining staffing needs.

5. Data Collection

   In this step, primary and secondary data are gathered to support the workload analysis. The data typically includes task descriptions, working hours, task duration, task frequency, and the number of current supervisors. Data collection methods may involve interviews, observations, time studies, and document analysis. Accurate data collection is crucial to ensure the reliability of the analysis.

6. Data Processing

   Using the FTE Method, after collecting the necessary data, the researcher processes the information using the Full Time Equivalent (FTE) method. This involves calculating the total workload in hours and dividing it by the available working time per employee. The FTE formula provides a quantitative representation of how many full-time employees are required to handle the workload effectively. This step enables the identification of workforce gaps or surpluses.

7. Result and Discussion

At this stage, the results from the FTE calculations are analyzed and interpreted. The researcher compares the actual number of supervisors with the required number derived from the FTE analysis. The discussion highlights any discrepancies and explores the implications of the findings, such as potential overload or underutilization of staff. The discussion also relates the findings to the literature reviewed earlier in the study.

8. Conclusion and Recommendation

   Based on the analysis and discussion, conclusions are drawn regarding the adequacy of the current workforce and the efficiency of workload distribution. The researcher provides practical recommendations to the company, such as adjusting the number of supervisors, redistributing tasks, or implementing changes to improve operational efficiency. These recommendations aim to support better manpower planning and decision-making in the organization.

3.5 Research Framework

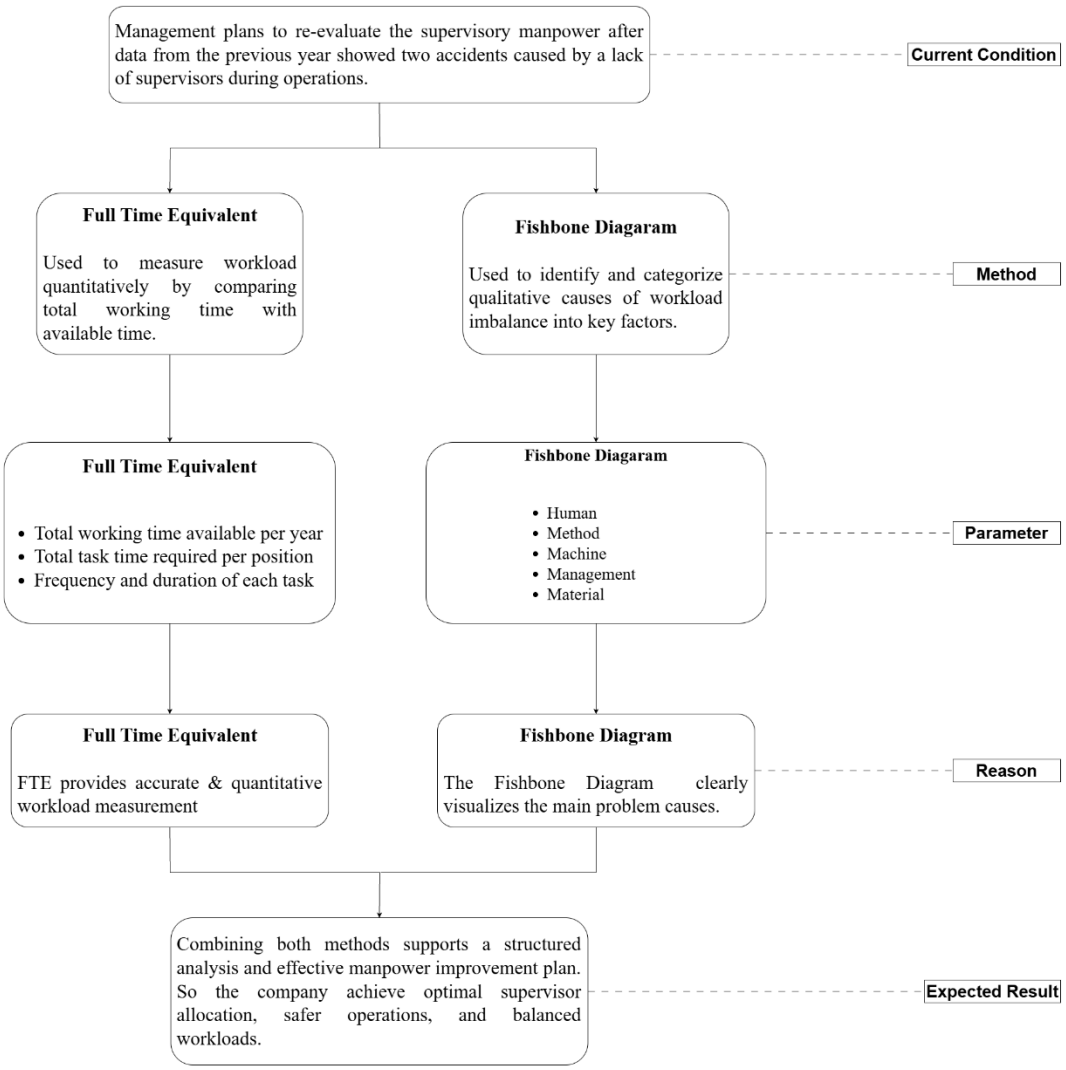


Figure 3.2 Research Framework

These findings are supported by:

- Rachmuddin et al. (2021) proposed addition of 4 workers in the sample house and 2 other workersin the laboratory to normalize workloads and improve safety.
- Maryadi et al. (2023)– who recommended adding multiple supervisory and administrative staff to achieve workload balance and prevent operational overload.
- Holifahtus Sakdiyah et al. (2022) demonstrated that the Fishbone Diagram is an effective visual tool for identifying interrelated causes in management decisions.

CHAPTER IV
DATA COLLECTION AND DATA PROCESSING

4.1 Data Collection

4.1.1 Working Hours

At PT. XYZ, the supervisory workforce operates under a roster system designed to accommodate the continuous nature of coal hauling operations while also providing scheduled rest periods. The standard roster pattern consists of 56 days on-site followed by 16 days off-site.

During the 56-day on-site period, employees work for a set number of consecutive days and are also entitled to regular rest days. Within this on-site period, there are 8 days off allocated as part of the operational schedule to allow recovery and maintain worker well-being. This means that out of the 56 calendar days spent on-site, 48 days are actual working days, while the remaining 8 days are rest days.

This cycle is repeated throughout the year, resulting in a total of 245 working days annually for each supervisor. These 245 working days are used as the basis for calculating annual available working time, which is a critical parameter in the Full Time Equivalent (FTE) method. By converting working days into productive working hours, the analysis can accurately determine the real capacity of each supervisor to handle operational tasks.

There are also 2 different working hours, for office employees and field employees. Field working hours are 11 hours per day, and 10 hours per day for office working hours. So the total working hours in a year are 2450 hours for office working hours and 2695 hours for field working hours.

4.1.2 Cycle Time

The activity list serves as the basis for measuring workload by identifying and detailing every task performed by the employee being analyzed. *Cycle time* refers to the total amount of time required to complete one full occurrence of an activity from start to finish under normal working conditions. Cycle time is a critical parameter because it forms the basis for calculating the total workload of an employee. When multiplied by the frequency of the activity within a given period (e.g., per day, per

week, per month), it produces the total time spent on that activity, which is then aggregated across all activities to determine the employee's total workload. Below are the activity list and cycle time.

1. Human Capital Officer

Table 4.1 Human Capital Officer Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Controlling the employee attendance	1	Day	30	1	122.5
Individual Plan Development	1	Month	30	1	6
Reminder and Evaluation after Training	3	Month	30	1	2
Target achievement cell culture	6	Month	30	1	1
Lead Time Process Recruitment if employee reduce	1	Month	30	1	6
Process Administration employee out Company	1	Month	60	1	12
Do Lks Bipartit	1	Month	90	1	18
P5m	1	Day	30	1	122.5
Update Price Ol (Serve Permit Letter, Work Permit)	1	Day	60	1	245
Report Atr Company	1	Day	30	1	122.5
Report Atr Work Mitra	1	Day	30	1	122.5
Job Request (Update employee in Ellips, Pom natural disaster, and sign the report)	1	Day	60	1	245
Sign and Check the Declaration of Treatment, Care	Week	Week	120	2	208
Validation sick letter		Tentative	15	10	2.5
Checking overtime point	1	Month	60	1	12

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Checking BKM (Night Shift Support)	1	Month	60	1	12
Checking Incentive Manpower	1	Month	60	1	12
Payroll	1	Month	180	1	36
Follow Up Atmp Dan Admp	1	Month	10	1	2
EKI (Evaluation individual performance)	1	Year	60	1	1
Make a Letter of Guarantee	1	Month	30	10	60
Reconsolidate Manpower	1	Month	60	1	12
Reconsolidate attendance	1	Month	120	1	24
Write KPI HCS & HCD	1	Month	60	1	12
Validation Payroll proof	1	Month	120	1	24
Monitoring OM Dan MM	1	Month	15	1	3
Recapitulation Unfit Employee	1	Month	30	1	6
Monitoring GL Dan FGDP	1	Month	15	1	3
Monitoring Admt Admp	1	Month	15	1	3
Validation of Ticket Price gap	1	Month	30	1	6
Monitoring Pkwt Dan Pkwtt	1	Month	15	1	3
Create a Work Certificate for Employee Administration		Tentative	15	24	6
disciplinary commission		Tentative	60	24	24
Summarizing BPJS Employment and Health	1	Month	120	1	24
CNC on Manpower	1	Month	15	1	3
Validation Invoice work partners	1	Month	60	1	12
Validation of P4		Tentative	30	20	10
BOC overtime and Incentive	1	Month	120	1	24

2. General Service

Table 4.2 General Service Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Monitor Driver and Facilities Availability in the Morning	1	Day	30	1	122.5
Monitor Water Facilities Provision in the Mess	1	Day	15	1	61.25
P5m	1	Day	30	1	122.5
Inspects Mess, Catering, WTP Water Treatment, Laundry. Canteen	1	Day	60	1	245
Stock Taking	1	Day	15	1	61.25
Input PA&UA	1	Day	5	1	20.41666667
Input Fuel Usage	1	Day	5	1	20.41666667
Monitoring PR PO	1	Day	15	1	61.25
Monitor Invoice	1	Day	15	1	61.25
Monitor Declaration	1	Day	15	1	61.25
Airline Ticket Application Monitor	1	Day	15	1	61.25
Validate Daily BA Daily Catering	1	Day	15	1	61.25
Pica Overhead Cost	1	Month	30	1	6
Food Committee	1	Month	120	1	24
Safety Talk	1	Month	60	1	12
Discussion with Driver	1	Month	120	1	24
Discussion with Work partners/ Maintenance	1	Month	120	1	24
Joint Mess Inspection with MCIP Entities	1	Month	120	1	24
Commissioning	6	Month	1080	1	36
Upload Greencard	1	Week	120	1	104
Field General Inspects	1	Week	180	1	156
Inspects Workshop Facilities		Week	120	1	104

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Validate Jam D FIT	1	Day	15	1	61.25
Setting facility	1	Day	10	1	40.83333333
Monitoring Order Pack Meal	1	Day	15	1	61.25
Monitoring database Mess		Week	30	1	26
Meeting Level 2	1	Day	45	1	183.75
Validate P2H	1	Day	5	1	20.41666667
Validate overtime Driver	1	Day	5	1	20.41666667
Recall Driver	1	Day	60	1	245
Monitoring G Track	1	Day	30	1	122.5
Controlling SPK	1	Month	15	1	3
Vendor Evaluation		Year	45	1	0.75
Inspection KPKK	1	Month	60	1	12
Make Suggestion System	1	Month	30	5	30
Make QCC		Year	30	1	0.5
Validate General Request	1	Day	15	1	61.25
Monitor Hotel Ticket Submission	1	Day	15	1	61.25
Asset Tacking Xtra Com	4	Month	1260	1	63

3. Community Development Officer

Table 4.3 Community Development Officer Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Official Visit	1	Month	360	1	72
Activity in Schools	1	Month	300	6	360
Visit of Community Figures	1	Month	420	6	504
Farmer Training	1	Year	480	3	24
Donor Darah	1	Year	480	1	8
Posyandu activity	1	Month	300	2	120
Greening Activities	1	Year	480	4	32

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
News Creation	1	Month	480	2	192
Community Social Activities	1	Month	180	7	216
Security coordination	1	Day	120	1	490
Coordination of External Conditions	1	Day	180	1	735
Program Timeframe Preparation and Review	1	Day	120	1	490
Monthly Security Review	1	Month	240	1	48
Inspect KPKK	1	Month	60	1	12
Formulating QCC		Year	30	1	0.5
Food Committee	1	Month	120	1	24
P5m	1	Day	30	1	122.5
Safety Talk	1	Month	60	1	12
Upload Greencard	1	Week	120	1	104
Make Suggestion System	1	Month	30	5	30

4. Plant People Development

Table 4.4 Plant People Development Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Pre Work	1	Day	60	1	245
P5M Plus SDayng Knowledge	1	Day	30	1	122.5
On Job Instruction	1	Month	45	6	54
Morning Briefing for Intern Mechanics	1	Day	90	1	367.5
Training In Class	1	Month	420	7	252
Final Training Report	1	Month	30	2	12
Monthly Report	1	Day	30	1	122.5
Other (Admission for the Arrival of New Intern Mechanics, Prepare the Best Mechanics)	1	Day	30	1	122.5

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Best Mechanic Of The Month	1	Day	60	1	245
Set Training Schedule	1	Month	420	1	84

5. Plant Hauling GL

Table 4.5 Plant Hauling GL Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Pre work	1	Day	30	1	122.5
P5M	1	Day	60	1	245
Cek service part	1	Day	15	1	61.25
JSA	1	Day	15	1	61.25
Observation of mechanical work	1	Day	150	1	612.5
Meeting	1	Day	90	1	367.5
Ensure MON validation order	1	Day	120	1	490
Repair	1	Day	120	1	490
Final check	1	Day	5	1	20.41666667
Safety talk		Week	120	1	104

6. Plant Engineer

Table 4.6 Plant Engineer Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Pre work	1	Day	30	1	122.5
P5m	1	Day	60	1	245
Creating Pareto data / unit performance	1	Day	60	1	245
Check the condition of the unit in the field	1	Day	120	1	490
Daily meeting	1	Day	120	1	490

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Working on task analysis report	1	Day	60	1	245
Carrying out FUI follow up instructions	1	Day	60	1	245
Generating Trent CMI condition monitoring index data		Week	60	1	52
Make weekly KPI		Week	120	1	104
Safety talk		Week	60	1	52

7. Tire GL

Table 4.7 Tire GL Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Pre work, P5M, P2H	1	Day	60	1	245
Remove and Install Tyre	1	Day	120	1	490
Inspects Tyre	1	Day	60	1	245
Repair Tyre	1	Day	180	1	735
R&I Breakdown	1	Day	120	1	490
Housekeeping	1	Day	30	1	122.5

8. Planner

Table 4.8 Planner Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Pre work	1	Day	30	1	122.5
P5M	1	Day	60	1	245
Cek part service	1	Day	10	1	40.83333333
Analisa Cost	1	Day	10	1	40.83333333
Cost Planning	1	Day	180	1	735
Daily meeting	1	Day	90	1	367.5

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Follow up meeting result	1	Day	60	1	245
Provide requested data (Order, Request)	1	Day	10	1	40.83333333
Plan Overhaul		Week	60	1	52
Work SPA		Week	90	1	78
Update HM	1	Month	120	1	24
Update Proposal	1	Month	60	1	12
Update Forecast Next Month	1	Month	120	1	24
Forecast Week 1	1	Month	120	1	24
Update Maintenance	1	Month	180	1	36
Midleft Overhaul Execution Update		Week	120	1	104
Safety Talk		Week	90	1	78

9. SSE GL

Table 4.9 SSE GL Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
P5m	1	Day	15	1	61.25
Mechanic Activity Monitor	1	Day	240	1	980
Daily Meeting Level 2	1	Day	60	1	245
Monitoring Field Breakdown	1	Day	180	1	735
Work Inspection	1	Day	15	1	61.25
Observation	1	Day	15	1	61.25
Adjust Mechanics Worksheet	1	Day	30	1	122.5
Work Order	1	Day	30	1	122.5
Oji	1	Day	30	1	122.5
Pending Shift	1	Day	15	1	61.25

10. Warehouse GL

Table 4.10 Warehouse GL Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
P5M	1	Day	30	1	122.5
Collect Data KPI	1	Day	60	1	245
Reconsolidate data to UT Warehouse	1	Day	120	1	490
Check Data MIT(Material in Transit)	1	Day	60	1	245
Creating KPI performance reports	1	Week	120	1	104
Receipt of goods from the expedition	1	Week	180	2	312
Checking receipt of goods issued	1	Day	60	1	245
Expedition monitoring	2	Day	30	1	61.25
Create monthly KPI performance reports	1	Month	60	1	12
Creating a CST (Cyclic Stock Tacking) report	1	Day	120	1	490
Issuing stock goods expenditure	1	Day	15	10	612.5
Housekeeping	1	Day	30	1	122.5
Safety talk	1	Week	60	1	52

11. Inventory & Purchasing GL

Table 4.11 Inventory & Purchasing GL Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
P5m	1	Day	30	1	122.5
Monitoring Stock	1	Day	60	1	245
Monitoring the Arrival of Purchase Order Goods	1	Day	60	1	245
Monitoring KPI	1	Day	60	1	245

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Review Cost Posting Daily Month To Date	1	Day	60	1	245
Analize Movement Spare Part MONT To Date	1	Day	30	1	122.5
Daily Meeting Plant with Ut	1	Day	90	1	367.5
Follow Up MOM Minutes Of Meeting Level 1 Dan Level 2	1	Day	180	1	735
Review Effectiveness Part On Stock VHS Dan Consignment	1	Day	60	1	245
Daily Approve Dan Review PO	1	Day	30	1	122.5
Meeting Weekly UT SM Readiness And Availability Parts)		Week	90	1	78
Weekly Meeting Internal KPI		Week	120	1	104
Weekly Review SAP Department		Week	30	1	26
Safety Talk		Week	60	1	52
Krida		Week	120	1	104
Input PDCA Program Dep SM		Week	120	1	104
Input SHE Program Dep SM		Week	120	1	104
Review KPI, Form9 (PDCA Program)	1	Month	150	1	30
Meeting KPI SM HO	1	Month	90	1	18
Monitoring FCI Dan Consignment	1	Month	60	1	12
Stock Opname	1	Month	240	1	48

12. Mine Infrastructure Engineer

Table 4.12 Mine Infrastructure Engineer Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Evaluation of Road Maintenance Work	1	Day	30	1	122.5

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Monitoring Stock and Use of Split Stone	1	Day	30	1	122.5
Review of Rm Hasq Dam Hauling Activities	1	Day	60	1	245
Daily Meeting with Owner and work partner	1	Day	60	1	245
Reconsolidate Day Work	1	Day	30	1	122.5
Meeting Daily Level 2	1	Day	60	1	245
Road Hauling Inspection	1	Day	150	1	612.5
Planning RM Work	1	Day	30	1	122.5
Join Inspection Urci (Assess Condition)		Week	240	1	208
Construction Work Assessment		Tentative	60	36	36
Operational Weekly Meeting with Owner		Week	120	1	104
Review KPI, Form9 (PDCA Program)		Week	30	1	26
Creating Construction Work Designs		Tentative	180	5	15
End Of Month Review	1	Month	120	1	24
Monthly Plan	1	Month	60	1	12
Strategic Planning Road	1	Month	120	1	24
Work Area Assessment		Tentative	60	60	60
On job trip	1	Day	60	1	245
Split Stone Material Test	1	Month	120	1	24
Evaluation of Tool Working Hours and Tool Productivity	1	Day	30	1	122.5
Cost Evaluation		Week	30	1	26

13. Data Analyst

Table 4.13 Data Analyst Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Operational Production Monitoring	1	Day	15	1	245
Validate the Report	1	Day	15	1	245
Sending Report to HO	1	Day	10	1	40.833333
Sending Report to ABB	1	Day	10	1	40.833333
Creating Meeting Materials with Customers and Production Reviews	1	Day	60	1	245
Daily Meeting Safari	1	Day	60	1	245
Daily Meeting Level 2	1	Day	5	1	20.416667
Reviewing Level 1 Meeting Materials	1	Day	60	1	245
Meeting Level 1	1	Day	120	1	490
Meeting with Subcon Partners	1	Week	90	1	78
Meeting with Cust weekly	1	Week	120	1	104
Review Report to ABB	1	Month	120	1	24
Review Report to HO	1	Month	120	1	24
Create a Monthly Plan to ABB	1	Month	120	1	24
Create a Monthly Plan to HO	1	Month	120	1	24
Monthly Plan Proposal (Internal Site	1	Month	1	1	24

14. Road Maintenance GL

Table 4.14 Road Maintenance GL Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
P5m	1	Day	5	1	20.41666667
Operator Work Readiness Validation	1	Day	20	1	81.66666667
Validate Jam D FIT	1	Day	10	1	40.83333333
Create Form Fatigue	1	Day	10	1	40.83333333

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Validate P2h	1	Day	10	1	40.83333333
Inspect Work Area	1	Day	30	1	122.5
Put Up Signs	1	Day	5	1	20.41666667
Unit Equipment	1	Day	10	1	40.83333333
Maintenance Supervision, Coordination with Other GL,	1	Day	300	1	1225
Daily Meeting Level 2	1	Day	60	1	245
Ensure maintenance is in accordance with SOP and plan	1	Day	30	1	122.5
Maintenance Supervision, Coordination with Other Gl,	1	Day	300	1	1225
Ensuring that maintenance is in accordance with SOP and plan	1	Day	30	1	122.5
Evaluation of Work Activities	1	Day	30	1	122.5
Fill out the Pkh Form, Handover Report, Gl Checklist, RCI	1	Day	30	1	122.5
Planning the Next RM Shift's Work	1	Day	30	1	122.5
Validate Timesheet	1	Day	60	1	245
Unit Productivity Evaluation	1	Day	5	1	20.41666667
Pending with other Shift	1	Day	15	1	61.25

15. Hauling GL

Table 4.15 Hauling GL Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
P5m, Change Shift,P2h	1	Day	60	1	245
Validation of D Fit, Creation of Fatigue Form	1	Day	60	1	245
Coordinate Change Shift Lain	1	Day	30	1	122.5

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Work Area Check (CPP, Auger, Washing Plan, Airport Crusher, Meta Sector 1, WMP21)	1	Day	150	1	612.5
Meeting Safari	1	Day	60	1	245
Monitoring Hauling	1	Day	60	1	245
Coordinate Area CPP, Louding, Alat Louding	1	Day	60	1	245
Observation ABB Road Km65 - 43	1	Day	120	1	490
Work Area Check (CPP, Auger, Washing Plan, Airport Crushes, Meta Sector 1, WMP21)	1	Day	150	1	612.5
Pending Jobb, Validate Timesheet	1	Day	60	1	245

16. Operation Site Instructor

Table 4.16 Operation Site Instructor Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
P5m	1	Day	15	1	61.25
Ensuring Intern Operators Advance to Senior INFIL Units	1	Day	30	1	122.5
G Track Data Retrieval And Validation	1	Day	45	1	183.75
Meeting Koor Dengan Tim Operation	1	Day	60	1	245
Administration For Operation	1	Day	300	1	1225
Monitoring Activities in the Field	1	Day	120	1	490
Make a plan for tomorrow's activities	1	Day	30	1	122.5
Weekly Meeting HO	1	Week	180	1	156

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Instructor Meeting	1	Week	120	1	104

17. SHE Site Leader

Table 4.17 SHE Site Leader Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
P5m	1	Day	30	1	122.5
Safety Talk		Week	60	1	52
Reporting		Week	180	1	156
Reporting	1	Month	120	1	24
Safety Induction		Week	60	3	156
She Training	1	Month	360	1	72
Daily Coordination Crew Operations Activity	1	Day	60	1	245
Msmi Dan Reporting		Week	180	1	156
Tsmi Dan Reporting		Week	180	1	156
Sidak Bersama Abb Dan Kpkk		Week	120	1	104
Joint Management Internal Inspection		Week	120	1	104
Assessment Activity		Week	120	1	104
Validate SHE Programs, D Fit, G Track	1	Day	60	1	245
Commissioning Unit	6	Month	360	1	12
Monitoring SAP		Week	120	1	104
Meeting, Food Com	1	Month	120	1	24
Critical Hour Validation and Monitoring	1	Day	60	1	245
Coordination of WR and PR and Submission of PP	1	Day	60	1	245

18. ICT Officer

Table 4.18 ICT Officer Cycle Time

Activity	Period		Time (Minute)	Frequency	Total Time (Hour)
Daily Monitoring Network	1	Day	60	1	245
Check Server	1	Day	15	1	61.25
Check Backup Server	1	Day	10	1	40.83333333
Ensuring Employee Attendance Data Retrieval	1	Day	5	1	20.41666667
Preventive Maintenance Network	1	Month	1440	1	288
Desktop	1	Month	3360	1	672
Ups Central	1	Day	5	1	20.41666667

4.1.3 Allowance

When calculating the workload, adjustment factors are carried out by considering the conditions in the field and the operator's ability to complete the work. Allowance obtained by direct observation in the field by paying attention to the conditions when the operator is working. In this study, allowances are divided into two categories: office allowances and field allowances. The office workers' allowance is calculated at 18% of working time, reflecting the need to accommodate various factors that affect work efficiency in an office environment, such as administrative interruptions or break times. Meanwhile, the allowance for field workers is set higher, at 30%. This is due to the more challenging working conditions in the field, such as weather factors, physical risks, or fatigue from heavy activities. This amount is designed to ensure that field workers have sufficient additional time to maintain productivity and occupational health. Below are the table of allowance:

Table 4.19 Allowance Office

Allowance	Categories	Percentage
Constant Allowance	Personal Allowance	5
	Basic Fatigue Allowance	4
Variable Allowance		
Bad Light	Well Below	2
Mental Strain	Complex	4
Monotony	Medium	1

Noise	Intermittent - loud	2
Total		18

Table 4.20 Allowance Field

Allowance	Categories	Percentage
Constant Allowance	Personal Allowance	5
	Basic Fatigue Allowance	4
Variable Allowance		
Bad Light	Well Below	2
Mental Strain	Complex	4
Atmospheric condition	Medium	10
Noise	Intermittent – very loud	5
Total		30

4.2 Data Processing

4.2.1 Standard Time

Standard time is the amount of time reasonably required by a normal worker to complete a task carried out under the best working system. The following is an example of standard time calculation for a Human Capital Officer on "Controlling the employee attendance" task.

$$Standard\ Time\ = Cycle\ Time\ \times \frac{100}{100\ - Allowance}$$

$$Standard\ Time\ = 122.5\ \times \frac{100}{100\ - 18}$$

$$Standard\ Time\ = 149.3902439$$

From the above calculation, it can be interpreted that Human Capital Officer at the workstation for "Controlling the employee attendance", which is 122.5 hours. The results of other standard time calculations can be seen in the Tables as follows:

1. Human Capital Officer

Table 4.21 Human Capital Officer Standard Time

Activity	Total Time (Hour)	Standard Time
Controlling the employee attendance	122.5	149.3902439

Activity	Total Time (Hour)	Standard Time
Individual Plan Development	6	7.317073171
Reminder and Evaluation after Training	2	2.43902439
Target achievement cell culture	1	1.219512195
Lead Time Process Recruitment if employee reduce	6	7.317073171
Process Administration employee out Company	12	14.63414634
Do Lks Bipartit	18	21.95121951
P5m	122.5	175
Update Price Ol (Serve Permit Letter, Work Permit)	245	298.7804878
Report Atr Company	122.5	149.3902439
Report Atr Work Mitra	122.5	149.3902439
Job Request (Update employee in Ellips, Pom natural disaster, and sign the report)	245	298.7804878
Sign and Check the Declaration of Treatment, Care	208	253.6585366
Validation sick letter	2.5	3.048780488
Checking overtime point	12	14.63414634
Checking BKM (Night Shift Support)	12	14.63414634
Checking Incentive Manpower	12	14.63414634
Payroll	36	43.90243902
Follow Up Atmp Dan Admp	2	2.43902439
EKI (Evaluation individual performance)	1	1.219512195
Make a Letter of Guarantee	60	73.17073171

Activity	Total Time (Hour)	Standard Time
Reconsolidate Manpower	12	14.63414634
Reconsolidate attendance	24	29.26829268
Write KPI HCS & HCD	12	14.63414634
Validation Payroll proof	24	29.26829268
Monitoring OM Dan MM	3	3.658536585
Recapitulation Unfit Employee	6	7.317073171
Monitoring GL Dan FGDP	3	3.658536585
Monitoring Admt Admp	3	3.658536585
Validation of Ticket Price gap	6	7.317073171
Monitoring Pkwt Dan Pkwtt	3	3.658536585
Create a Work Certificate for Employee Administration	6	7.317073171
disciplinary commission	24	29.26829268
Summarizing BPJS Employment and Health	24	29.26829268
CNC on Manpower	3	3.658536585
Validation Invoice work partners	12	14.63414634
Validation of P4	10	12.19512195
BOC overtime and Incentive	24	29.26829268

2. General Service

Table 4.22 General Service Standard Time

Activity	Total Time (Hour)	Standard Time
Monitor Driver and Facilities Availability in the Morning	122.5	149.3902439
Monitor Water Facilities Provision in the Mess	61.25	74.69512195
P5m	122.5	149.3902439

Activity	Total Time (Hour)	Standard Time
Inspects Mess, Catering, WTP Water Treatment, Laundry. Canteen	245	298.7804878
Stock Taking	61.25	74.69512195
Input PA&UA	20.41666667	24.89837398
Input Fuel Usage	20.41666667	24.89837398
Monitoring PR PO	61.25	74.69512195
Monitor Invoice	61.25	74.69512195
Monitor Declaration	61.25	74.69512195
Airline Ticket Application Monitor	61.25	74.69512195
Validate Daily BA Daily Catering	61.25	74.69512195
Pica Overhead Cost	6	7.317073171
Food Committee	24	29.26829268
Safety Talk	12	14.63414634
Discussion with Driver	24	29.26829268
Discussion with Work partners/ Maintenance	24	29.26829268
Joint Mess Inspection with MCIP Entities	24	29.26829268
Commissioning	36	43.90243902
Upload Greencard	104	126.8292683
Field General Inspects	156	222.8571429
Inspects Workshop Facilities	104	148.5714286
Validate Jam D FIT	61.25	74.69512195
Setting facility	40.83333333	49.79674797
Monitoring Order Pack Meal	61.25	74.69512195
Monitoring database Mess	26	31.70731707
Meeting Level 2	183.75	262.5
Validate P2H	20.41666667	24.89837398

Activity	Total Time (Hour)	Standard Time
Validate overtime Driver	20.41666667	24.89837398
Recall Driver	245	298.7804878
Monitoring G Track	122.5	149.3902439
Controlling SPK	3	3.658536585
Vendor Evaluation	0.75	0.914634146
Inspection KPKK	12	14.63414634
Make Suggestion System	30	36.58536585
Make QCC	0.5	0.609756098
Validate General Request	61.25	74.69512195
Monitor Hotel Ticket Submission	61.25	74.69512195
Asset Tacking Xtra Com	63	76.82926829

3. Community Development Officer

Table 4.23 Community Development Officer Standard Time

Activity	Total Time (Hour)	Standard Time
Official Visit	72	102.8571429
Activity in Schools	360	514.2857143
Visit of Community Figures	504	720
Farmer Training	24	34.28571429
Donor Darah	8	11.42857143
Posyandu activity	120	171.4285714
Greening Activities	32	45.71428571
News Creation	192	274.2857143
Community Social Activities	216	308.5714286
Security coordination	490	700
Coordination of External Conditions	735	1050

Activity	Total Time (Hour)	Standard Time
Program Timeframe Preparation and Review	490	700
Monthly Security Review	48	58.53658537
Inspect KPKK	12	14.63414634
Create QCC	0.5	0.609756098
Food Committee	24	29.26829268
P5m	122.5	149.3902439
Safety Talk	12	14.63414634
Upload Greencard	104	126.8292683
Make Suggestion System	30	36.58536585

4. Plant People Development

Table 4.24 Plant People Development Standard Time

Activity	Total Time (Hour)	Standard Time
Pre Work	245	350
P5M Plus SDayng Knowledge	122.5	175
On Job Instruction	54	77.14285714
Morning Briefing for Intern Mechanics	367.5	525
Training In Class	252	307.3170732
Final Training Report	12	14.63414634
Monthly Report	122.5	149.3902439
Other (Admission for the Arrival of New Intern Mechanics, Prepare the Best Mechanics)	122.5	149.3902439
Best Mechanic of The Month	245	350
Set Training Schedule	84	102.4390244

5. Plant Hauling GL

Table 4.25 Plant Hauling GL Standard Time

Activity	Total Time (Hour)	Standard Time
Pre work	122.5	175
P5M	245	350
Cek service part	61.25	87.5
JSA	61.25	87.5
Observation of mechanical work	612.5	875
Meeting	367.5	448.1707317
Ensure MON validation order	490	700
Repair	490	700
Final check	20.41666667	29.16666667
Safety talk	104	148.5714286

6. Plant Engineer

Table 4.26 Plant Engineer Standard Time

Activity	Total Time (Hour)	Standard Time
Pre work	122.5	175
P5m	245	350
Creating Pareto data / unit performance	245	298.7804878
Check the condition of the unit in the field	490	700
Daily meeting	490	597.5609756
Working on task analysis report	245	298.7804878
Carrying out FUI follow up instructions	245	298.7804878
Generating Trent CMI condition monitoring index data	52	63.41463415
Make weekly KPI	104	126.8292683

Activity	Total Time (Hour)	Standard Time
Safety talk	52	74.28571429

7. Tire GL

Table 4.27 Tire GL Standard Time

Activity	Total Time (Hour)	Standard Time
Pre work, P5M, P2H	245	350
Remove and Install Tyre	490	700
Inspects Tyre	245	350
Repair Tyre	735	1050
R&I Breakdown	490	700
Housekeeping	122.5	175

8. Planner

Table 4.28 Planner Standard Time

Activity	Total Time (Hour)	Standard Time
Pre work	122.5	175
P5M	245	350
Cek part service	40.83333333	49.79674797
Analisa Cost	40.83333333	49.79674797
Cost Planning	735	896.3414634
Daily meeting	367.5	448.1707317
Follow up meeting result	245	298.7804878
Provide requested data (Order, Request)	40.83333333	49.79674797
Plan Overhaul	52	63.41463415
Work SPA	78	95.12195122
Update HM	24	29.26829268
Update Proposal	12	14.63414634

Activity	Total Time (Hour)	Standard Time
Update Forecast Next Month	24	29.26829268
Forecast Week 1	24	29.26829268
Update Maintenance	36	43.90243902
Midleft Overhaul Execution Update	104	126.8292683
Safety Talk	78	111.4285714

9. SSE GL

Table 4.29 SSE GL Standard Time

Activity	Total Time (Hour)	Standard Time
P5m	61.25	87.5
Mechanic Activity Monitor	980	1400
Daily Meeting Level 2	245	350
Monitoring Field Breakdown	735	1050
Work Inspection	61.25	87.5
Observation	61.25	87.5
Adjust Mechanics Worksheet	122.5	175
Work Order	122.5	175
Oji	122.5	175
Pending Shift	61.25	87.5

10. Warehouse GL

Table 4.30 Warehouse GL Standard Time

Activity	Total Time (Hour)	Standard Time
P5M	122.5	149.3902439
Collect Data KPI	245	298.7804878
Reconsolidate data to UT Warehouse	490	597.5609756

Activity	Total Time (Hour)	Standard Time
Check Data MIT(Material in Transit)	245	298.7804878
Creating KPI performance reports	104	126.8292683
Receipt of goods from the expedition	312	445.7142857
Checking receipt of goods issued	245	298.7804878
Expedition monitoring	61.25	74.69512195
Create monthly KPI performance reports	12	14.63414634
Creating a CST (Cyclic Stock Tacking) report	490	700
Issuing stock goods expenditure	612.5	875
Housekeeping	122.5	149.3902439
Safety talk	52	74.28571429

11. Inventory & Purchasing GL

Table 4.31 Inventory & Purchasing GL Standard Time

Activity	Total Time (Hour)	Standard Time
P5m	122.5	149.3902439
Monitoring Stock	245	298.7804878
Monitoring the Arrival of Purchase Order Goods	245	298.7804878
Monitoring KPI	245	298.7804878
Review Cost Posting Daily Month To Date	245	298.7804878
Analize Movement Spare Part MONT To Date	122.5	149.3902439
Daily Meeting Plant with Ut	367.5	448.1707317
Follow Up MOM Minutes of Meeting Level 1 Dan Level 2	735	896.3414634

Activity	Total Time (Hour)	Standard Time
Review Effectiveness Part On Stock VHS Dan Consignment	245	298.7804878
Daily Approve Dan Review PO	122.5	149.3902439
Meeting Weekly UT SM Readiness and Availability Parts)	78	95.12195122
Weekly Meeting Internal KPI	104	126.8292683
Weekly Review SAP Department	26	31.70731707
Safety Talk	52	74.28571429
Krida	104	126.8292683
Input PDCA Program Dep SM	104	126.8292683
Input SHE Program Dep SM	104	126.8292683
Review KPI, Form9 (PDCA Program)	30	36.58536585
Meeting KPI SM HO	18	21.95121951
Monitoring FCI Dan Consignment	12	14.63414634
Stock Opname	48	58.53658537

12. Mine Infrastructure Engineer

Table 4.32 Mine Infrastructure Engineer Standard Time

Activity	Total Time (Hour)	Standard Time
Evaluation of Road Maintenance Work	122.5	149.3902439
Monitoring Stock and Use of Split Stone	122.5	149.3902439
Review of Rm Hasq Dam Hauling Activities	245	298.7804878
Meeting Daily Bersama Owner and work partner	245	350
Reconsolidate Day Work	122.5	175

Activity	Total Time (Hour)	Standard Time
Meeting Daily Level 2	245	298.7804878
Road Hauling Inspection	612.5	875
Planning RM Work	122.5	149.3902439
Join Inspection Urci (Assess Condition)	208	297.1428571
Construction Work Assessment	36	51.42857143
Meeting Weekly Operational with Owner	104	126.8292683
Review KPI, Form9 (PDCA Program)	26	31.70731707
Creating Construction Work Designs	15	18.29268293
End Of Month Review	24	29.26829268
Monthly Plan	12	14.63414634
Strategic Planning Road	24	29.26829268
Work Area Assessment	60	85.71428571
On job trip	245	350
Split Stone Material Test	24	34.28571429
Evaluation of Tool Working Hours and Tool Productivity	122.5	149.3902439
Cost Evaluation	26	31.70731707

13. Data Analyst

Table 4.33 Data Analyst Standard Time

Activity	Total Time (Hour)	Standard Time
Operational Production Monitoring	245	298.78
Validate the Report	245	298.78
Sending Report to HO	40.833333	49.797
Sending Report to ABB	40.833333	49.797

Activity	Total Time (Hour)	Standard Time
Creating Meeting Materials with Customers and Production Reviews	245	298.78
Daily Meeting Safari	245	298.78
Daily Meeting Level 2	20.416667	24.898
Reviewing Level 1 Meeting Materials	245	298.78
Meeting Level 1	490	597.56
Meeting with Subcon Partners	78	95.122
Meeting with Cust weekly	104	126.83
Review Report to ABB	24	29.268
Review Report to HO	24	29.268
Create a Monthly Plan to ABB	24	29.268
Create a Monthly Plan to HO	24	29.268
Monthly Plan Proposal (Internal Site	24	29.268

14. Road Maintenance GL

Table 4.34 Road Maintenance GL Standard Time

Activity	Total Time (Hour)	Standard Time
P5m	20.41666667	29.16666667
Operator Work Readiness Validation	81.66666667	116.6666667
Validate Jam D FIT	40.83333333	58.33333333
Create Form Fatigue	40.83333333	58.33333333
Validate P2h	40.83333333	58.33333333
Inspect Work Area	122.5	175
Put Up Signs	20.41666667	29.16666667
Unit Equipment	40.83333333	58.33333333
Maintenance Supervision, Coordination with Other GL,	1225	1750

Activity	Total Time (Hour)	Standard Time
Meeting Daily Level 2	245	350
Ensure maintenance is in accordance with SOP and plan	122.5	175
Maintenance Supervision, Coordination with Other Gl,	1225	1750
Ensure maintenance is in accordance with SOP and plan	122.5	175
Evaluation of Work Activities	122.5	175
Fill out the Pkh Form, Handover Report, Gl Checklist, RCI	122.5	175
Planning the Next RM Shift's Work	122.5	175
Validate Timesheet	245	350
Unit Productivity Evaluation	20.41666667	29.16666667
Pending with other Shift	61.25	87.5

15. Hauling GL

Table 4.35 Hauling GL Standard Time

Activity	Total Time (Hour)	Standard Time
P5m, Change Shift,P2h	245	350
Validation of D Fit, Creation of Fatigue Form	245	350
Coordinate Change Shift Lain	122.5	175
Work Area Check (CPP, Auger, Washing Plan, Airport Chruses, Meta Sector 1, WMP21)	612.5	875
Meeting Safari	245	350
Monitoring Hauling	245	350
Coordinate Area CPP, Louding, Alat Louding	245	350

Activity	Total Time (Hour)	Standard Time
Observation ABB Road Km65 - 43	490	700
Work Area Check (CPP, Auger, Washing Plan, Airport Crushes, Meta Sector 1, WMP21)	612.5	875
Pending Jobb, Validate Timesheet	245	350

16. Operation Site Instructor

Table 4.36 Operation Site Instructor Standard Time

Activity	Total Time (Hour)	Standard Time
P5m	61.25	87.5
Ensuring Intern Operators Advance to Senior INFIL Units	122.5	175
G Track Data Retrieval And Validation	183.75	262.5
Coordination Meeting with Operational Team	245	350
Administration For Operation	1225	1493.902439
Monitoring Activities in the Field	490	700
Make a plan for tomorrow's activities	122.5	175
Weekly Meeting HO	156	190.2439024
Instructor Meeting	104	126.8292683

17. SHE Site Leader

Table 4.37 SHE Site Leader Standard Time

Activity	Total Time (Hour)	Standard Time
P5m	122.5	149.3902439

Activity	Total Time (Hour)	Standard Time
Safety Talk	52	74.28571429
Reporting	156	190.2439024
Reporting	24	29.26829268
Safety Induction	156	190.2439024
She Training	72	87.80487805
Daily Coordination Crew Operations Activity	245	350
Msmi Dan Reporting	156	222.8571429
Tsmi Dan Reporting	156	222.8571429
Sidak Bersama Abb Dan Kpkk	104	148.5714286
Joint Management Internal Inspection	104	148.5714286
Assessment Activity	104	148.5714286
Validate SHE Programs, D Fit, G Track	245	298.7804878
Commissioning Unit	12	17.14285714
Monitoring SAP	104	126.8292683
Meeting, Food Com	24	29.26829268
Critical Hour Validation and Monitoring	245	298.7804878
Coordination of WR and PR and Submission of PP	245	298.7804878

18. ICT Officer

Table 4.38 ICT Officer Standard Time

Activity	Total Time (Hour)	Standard Time
Daily Monitoring Network	245	298.78
Check Server	61.25	74.695
Check Backup Server	40.83333333	49.797
Ensuring Employee Attendance Data Retrieval	20.41666667	24.898

Activity	Total Time (Hour)	Standard Time
Preventive Maintenance Network	288	351.22
Desktop	672	819.512
Ups Central	20.41666667	24.898

4.2.2 Full Time Equivalent

The following is an example of a Time Equivalent calculation for a Human Capital Officer on the "Controlling the employee attendance" task.

$$FTE = \frac{Standard\ Time}{Total\ Working\ Hours}$$

$$FTE = \frac{149.390}{2450}$$

$$FTE = 0.061$$

From the above calculation, it can be interpreted that the Human Capital Officer at the workstation for "Controlling the employee attendance" has an FTE Index of 0.061. The results of other FTE Index calculations can be seen in the Tables as follows:

1. Human Capital Officer

Table 4.39 Human Capital Officer FTE Index

Activity	Standard Time	FTE
Controlling the employee attendance	149.3902439	0.061
Individual Plan Development	7.317073171	0.003
Reminder and Evaluation after Training	2.43902439	0.001
Target achievement cell culture	1.219512195	0.0005

Activity	Standard Time	FTE
Lead Time Process Recruitment if employee reduce	7.317073171	0.003
Process Administration employee out Company	14.63414634	0.006
Do Lks Bipartit	21.95121951	0.009
P5m	175	0.071
Update Price Ol (Serve Permit Letter, Work Permit)	298.7804878	0.122
Report Atr Company	149.3902439	0.061
Report Atr Work Mitra	149.3902439	0.061
Job Request (Update employee in Ellips, Pom natural disaster, and sign the report)	298.7804878	0.122
Sign and Check the Declaration of Treatment, Care	253.6585366	0.104
Validation sick letter	3.048780488	0.001
Checking overtime point	14.63414634	0.006
Checking BKM (Night Shift Support)	14.63414634	0.006
Checking Incentive Manpower	14.63414634	0.006
Payroll	43.90243902	0.018
Follow Up Atmp Dan Admp	2.43902439	0.001
EKI (Evaluation individual performance)	1.219512195	0.0005
Make a Letter of Guarantee	73.17073171	0.03
Reconsolidate Manpower	14.63414634	0.006
Reconsolidate attendance	29.26829268	0.012
Write KPI HCS & HCD	14.63414634	0.006
Validation Payroll proof	29.26829268	0.012
Monitoring OM Dan MM	3.658536585	0.001

Activity	Standard Time	FTE
Recapitulation Unfit Employee	7.317073171	0.003
Monitoring GL Dan FGDP	3.658536585	0.001
Monitoring Admt Admp	3.658536585	0.001
Validation of Ticket Price gap	7.317073171	0.003
Monitoring Pkwt Dan Pkwtt	3.658536585	0.001
Create a Work Certificate for Employee Administration	7.317073171	0.003
disciplinary commission	29.26829268	0.012
Summarizing BPJS Employment and Health	29.26829268	0.012
CNC on Manpower	3.658536585	0.001
Validation Invoice work partners	14.63414634	0.006
Validation of P4	12.19512195	0.005
BOC overtime and Incentive	29.26829268	0.012
Total		0.792

2. General Service

Table 4.40 General Service FTE Index

Activity	Standard Time	FTE
Monitor Driver and Facilities Availability in the Morning	149.3902439	0.061
Monitor Water Facilities Provision in the Mess	74.69512195	0.03
P5m	149.3902439	0.061
Inspects Mess, Catering, WTP Water Treatment, Laundry. Canteen	298.7804878	0.122
Stock Taking	74.69512195	0.03
Input PA&UA	24.89837398	0.01

Activity	Standard Time	FTE
Input Fuel Usage	24.89837398	0.01
Monitoring PR PO	74.69512195	0.03
Monitor Invoice	74.69512195	0.03
Monitor Declaration	74.69512195	0.03
Airline Ticket Application Monitor	74.69512195	0.03
Validate Daily BA Daily Catering	74.69512195	0.03
Pica Overhead Cost	7.317073171	0.003
Food Committee	29.26829268	0.012
Safety Talk	14.63414634	0.006
Discussion with Driver	29.26829268	0.012
Discussion with Work partners/ Maintenance	29.26829268	0.012
Joint Mess Inspection with MCIP Entities	29.26829268	0.012
Commissioning	43.90243902	0.018
Upload Greencard	126.8292683	0.052
Field General Inspects	222.8571429	0.091
Inspects Workshop Facilities	148.5714286	0.061
Validate Jam D FIT	74.69512195	0.03
Setting facility	49.79674797	0.02
Monitoring Order Pack Meal	74.69512195	0.03
Monitoring database Mess	31.70731707	0.013
Meeting Level 2	262.5	0.107
Validate P2H	24.89837398	0.01
Validate overtime Driver	24.89837398	0.01
Recall Driver	298.7804878	0.122
Monitoring G Track	149.3902439	0.061
Controlling SPK	3.658536585	0.001

Activity	Standard Time	FTE
Vendor Evaluation	0.914634146	0
Inspection KPKK	14.63414634	0.006
Make Suggestion System	36.58536585	0.015
Make QCC	0.609756098	0
Validate General Request	74.69512195	0.03
Monitor Hotel Ticket Submission	74.69512195	0.03
Asset Tacking Xtra Com	76.82926829	0.031
Total		1.276

3. Community Development Officer

Table 4.41 Community Development Officer FTE Index

Activity	Standard Time	FTE
Official Visit	102.8571429	0.042
Activity in Schools	514.2857143	0.21
Visit of Community Figures	720	0.294
Farmer Training	34.28571429	0.014
Donor Darah	11.42857143	0.005
Posyandu activity	171.4285714	0.07
Greening Activities	45.71428571	0.019
News Creation	274.2857143	0.112
Community Social Activities	308.5714286	0.126
Security coordination	700	0.286
Coordination of External Conditions	1050	0.429
Program Timeframe Preparation and Review	700	0.286
Monthly Security Review	58.53658537	0.024
Inspect KPKK	14.63414634	0.006

Activity	Standard Time	FTE
Create QCC	0.609756098	0
Food Committee	29.26829268	0.012
P5m	149.3902439	0.061
Safety Talk	14.63414634	0.006
Upload Greencard	126.8292683	0.052
Make Suggestion System	36.58536585	0.015
Total		2.088

4. Plant People Development

Table 4.42 Plant People Development FTE Index

Activity	Standard Time	FTE
Pre-Work	350	0.065
P5M Plus SDayng Knowledge	175	0.13
On Job Instruction	77.14285714	0.029
Morning Briefing for Intern Mechanics	525	0.195
In-Class Training	307.3170732	0.114
Final Training Report	14.63414634	0.005
Monthly Report	149.3902439	0.055
Other (Admission for the Arrival of New Intern Mechanics, Prepare the Best Mechanics)	149.3902439	0.055
Best Mechanic of The Month	350	0.13
Set Training Schedule	102.4390244	0.038
Total		0.968

5. Plant Hauling GL

Table 4.43 Plant Hauling GL FTE Index

Activity	Standard Time	FTE
Pre work	175	0.065
P5M	350	0.13
Cek service part	87.5	0.032
JSA	87.5	0.032
Observation of mechanical work	875	0.325
Meeting	448.1707317	0.166
Ensure MON validation order	700	0.26
Repair	700	0.26
Final check	29.16666667	0.011
Safety talk	148.5714286	0.055
Total		1.336

6. Plant Engineer

Table 4.44 Plant Engineer FTE Index

Activity	Standard Time	FTE
Pre work	175	0.065
P5m	350	0.13
Creating Pareto data / unit performance	298.7804878	0.111
Check the condition of the unit in the field	700	0.26
Daily meeting	597.5609756	0.222
Working on task analysis report	298.7804878	0.111
Carrying out FUI follow up instructions	298.7804878	0.111
Generating Trent CMI condition monitoring index data	63.41463415	0.024
Make weekly KPI	126.8292683	0.047

Activity	Standard Time	FTE
Safety talk	74.28571429	0.028
Total		1.107

7. Tire GL

Table 4.45 Tire GL FTE Index

Activity	Standard Time	FTE
Pre work, P5M, P2H	350	0.13
Remove and Install Tyre	700	0.26
Inspects Tyre	350	0.13
Repair Tyre	1050	0.39
R&I Breakdown	700	0.26
Housekeeping	175	0.065
Total		1.234

8. Planner

Table 4.46 Planner FTE Index

Activity	Standard Time	FTE
Pre work	175	0.065
P5M	350	0.13
Cek part service	49.79674797	0.018
Cost Analysis	49.79674797	0.018
Cost Planning	896.3414634	0.333
Daily meeting	448.1707317	0.166
Follow up meeting result	298.7804878	0.111
Provide requested data (Order, Request)	49.79674797	0.018
Plan Overhaul	63.41463415	0.024
Work SPA	95.12195122	0.035

Activity	Standard Time	FTE
Update HM	29.26829268	0.011
Update Proposal	14.63414634	0.005
Update Forecast Next Month	29.26829268	0.011
Forecast Week 1	29.26829268	0.011
Update Maintenance	43.90243902	0.016
Midleft Overhaul Execution Update	126.8292683	0.047
Safety Talk	111.4285714	0.041
Total		1.062

9. SSE GL

Table 4.47 SSE GL FTE Index

Activity	Standard Time	FTE
P5m	87.5	0.032
Mechanic Activity Monitor	1400	0.519
Daily Meeting Level 2	350	0.13
Monitoring Field Breakdown	1050	0.39
Work Inspection	87.5	0.032
Observation	87.5	0.032
Adjust Mechanics Worksheet	175	0.065
Work Order	175	0.065
Oji	175	0.065
Pending Shift	87.5	0.032
Total		1.364

10. Warehouse GL

Table 4.48 Warehouse GL FTE Index

Activity	Standard Time	FTE
P5M	149.3902439	0.055
Collect KPI Data	298.7804878	0.111
Reconsolidate data to UT Warehouse	597.5609756	0.222
Check MIT Data (Material in Transit)	298.7804878	0.111
Creating KPI performance reports	126.8292683	0.047
Receipt of goods from the expedition	445.7142857	0.165
Checking receipt of goods issued	298.7804878	0.111
Expedition monitoring	74.69512195	0.028
Create monthly KPI performance reports	14.63414634	0.005
Creating a CST (Cyclic Stock Tacking) report	700	0.26
Issuing stock goods expenditure	875	0.325
Housekeeping	149.3902439	0.055
Safety talk	74.28571429	0.028
Total		1.523

11. Inventory & Purchasing GL

Table 4.49 Inventory & Purchasing GL FTE Index

Activity	Standard Time	FTE
P5m	149.3902439	0.055
Monitoring Stock	298.7804878	0.111
Monitoring the Arrival of Purchase Order Goods	298.7804878	0.111
Monitoring KPI	298.7804878	0.111

Activity	Standard Time	FTE
Review Cost Posting Daily Month To Date	298.7804878	0.111
Analize Movement Spare Part MONT To Date	149.3902439	0.055
Daily Meeting Plant with Ut	448.1707317	0.166
Follow Up MOM Minutes Of Meeting Level 1 Dan Level 2	896.3414634	0.333
Review Effectiveness Part On Stock VHS Dan Consignment	298.7804878	0.111
Daily Approve Dan Review PO	149.3902439	0.055
Meeting Weekly UT SM Readiness And Availability Parts)	95.12195122	0.035
Weekly Meeting Internal KPI	126.8292683	0.047
Weekly Review SAP Department	31.70731707	0.012
Safety Talk	74.28571429	0.028
Krida	126.8292683	0.047
Input PDCA Program Dep SM	126.8292683	0.047
Input SHE Program Dep SM	126.8292683	0.047
Review KPI, Form9 (PDCA Program)	36.58536585	0.014
Meeting KPI SM HO	21.95121951	0.008
Monitoring FCI Dan Consignment	14.63414634	0.005
Stock Opname	58.53658537	0.022
Total		1.521

12. Mine Infrastructure Engineer

Table 4.50 Mine Infrastructure Engineer FTE Index

Activity	Standard Time	FTE
Evaluation of Road Maintenance Work	149.3902439	0.061
Monitoring Stock and Use of Split Stone	149.3902439	0.061
Review of Rm Hasq Dam Hauling Activities	298.7804878	0.122
Meeting Daily Bersama Owner and work partner	350	0.143
Reconsolidate Day Work	175	0.071
Meeting Daily Level 2	298.7804878	0.122
Road Hauling Inspection	875	0.357
Planning RM Work	149.3902439	0.061
Join Inspection Urci (Assess Condition)	297.1428571	0.121
Construction Work Assessment	51.42857143	0.021
Meeting Weekly Operational with Owner	126.8292683	0.052
Review KPI, Form9 (PDCA Program)	31.70731707	0.013
Creating Construction Work Designs	18.29268293	0.007
End Of Month Review	29.26829268	0.012
Monthly Plan	14.63414634	0.006
Strategic Planning Road	29.26829268	0.012
Work Area Assessment	85.71428571	0.035
On job trip	350	0.143
Split Stone Material Test	34.28571429	0.014
Evaluation of Tool Working Hours and Tool Productivity	149.3902439	0.061
Cost Evaluation	31.70731707	0.013
Total		1.508

13. Data Analyst

Table 4.51 Data Analyst FTE Index

Activity	Standard Time	FTE
Operational Production Monitoring	298.78	0.122
Validate the Report	298.78	0.122
Sending Report to HO	49.797	0.02
Sending Report to ABB	49.797	0.02
Creating Meeting Materials with Customers and Production Reviews	298.78	0.122
Daily Meeting Safari	298.78	0.122
Daily Meeting Level 2	24.898	0.01
Reviewing Level 1 Meeting Materials	298.78	0.122
Meeting Level 1	597.56	0.244
Meeting with Subcon Partners	95.122	0.039
Meeting with Cust weekly	126.83	0.052
Review Report to ABB	29.268	0.012
Review Report to HO	29.268	0.012
Create a Monthly Plan to ABB	29.268	0.012
Create a Monthly Plan to HO	29.268	0.012
Monthly Plan Proposal (Internal Site	29.268	0.012
Total		1.055

14. Road Maintenance GL

Table 4.52 Road Maintenance GL FTE Index

Activity	Standard Time	FTE
P5m	29.16666667	0.011

Activity	Standard Time	FTE
Operator Work Readiness Validation	116.6666667	0.043
Validate Jam D FIT	58.33333333	0.022
Create Form Fatigue	58.33333333	0.022
Validate P2h	58.33333333	0.022
Inspect Work Area	175	0.065
Put Up Signs	29.16666667	0.011
Unit Equipment	58.33333333	0.022
Maintenance Supervision, Coordination with Other GL,	1750	0.649
Meeting Daily Level 2	350	0.13
Ensure maintenance is in accordance with SOP and plan	175	0.065
Maintenance Supervision, Coordination with Other Gl,	1750	0.649
Ensuring that maintenance is in accordance with SOP and plan	175	0.065
Evaluation of Work Activities	175	0.065
Fill out the Pkh Form, Handover Report, Gl Checklist, RCI	175	0.065
Planning the Next RM Shift's Work	175	0.065
Validate Timesheet	350	0.13
Unit Productivity Evaluation	29.16666667	0.011
Pending with other Shift	87.5	0.032
Total		2.143

15. Hauling GL

Table 4.53 Hauling GL FTE Index

Activity	Standard Time	FTE
P5m, Change Shift,P2h	350	0.13
Validation of D Fit, Creation of Fatigue Form	350	0.13
Coordinate Change Shift Lain	175	0.065
Work Area Check (CPP, Auger, Washing Plan, Airport Chruses, Meta Sector 1, WMP21)	875	0.325
Meeting Safari	350	0.13
Monitoring Hauling	350	0.13
Coordinate Area CPP, Louding, Alat Louding	350	0.13
Observation ABB Road Km65 - 43	700	0.26
Work Area Check (CPP, Auger, Washing Plan, Airport Crushes, Meta Sector 1, WMP21)	875	0.325
Pending Job, Validate Timesheet	350	0.13
Total		1.753

16. Operation Site Instructor

Table 4.54 Operation Site Instructor FTE Index

Activity	Standard Time	FTE
P5m	87.5	0.032
Ensuring Intern Operators Advance to Senior INFIL Units	175	0.065
G Track Data Retrieval And Validation	262.5	0.097
Meeting Koor Dengan Tim Operation	350	0.13

Activity	Standard Time	FTE
Administration For Operation	1493.902439	0.554
Monitoring Activities in the Field	700	0.26
Make a plan for tomorrow's activities	175	0.065
Weekly Meeting HO	190.2439024	0.071
Instructor Meeting	126.8292683	0.047
Total		1.321

17. SHE Site Leader

Table 4.55 SHE Site Leader FTE Index

Activity	Standard Time	FTE
P5m	149.3902439	0.061
Safety Talk	74.28571429	0.03
Reporting	190.2439024	0.078
Reporting	29.26829268	0.012
Safety Induction	190.2439024	0.078
SHE Training	87.80487805	0.036
Daily Coordination Crew Operations Activity	350	0.143
Msmi Dan Reporting	222.8571429	0.091
Tsmi Dan Reporting	222.8571429	0.091
Inspect with Abb Dan Kpkk	148.5714286	0.061
Joint Management Internal Inspection	148.5714286	0.061
Assessment Activity	148.5714286	0.061
Validate SHE Programs, D Fit, G Track	298.7804878	0.122
Commissioning Unit	17.14285714	0.007
Monitoring SAP	126.8292683	0.052

Activity	Standard Time	FTE
Meeting, Food Com	29.26829268	0.012
Critical Hour Validation and Monitoring	298.7804878	0.122
Coordination of WR and PR and Submission of PP	298.7804878	0.122
Total		1.238

18. ICT Officer

Table 4.56 ICT Officer FTE Index

Activity	Standard Time	FTE
Daily Monitoring Network	298.78	0.122
Check Server	74.695	0.03
Check Backup Server	49.797	0.02
Ensuring Employee Attendance Data Retrieval	24.898	0.01
Preventive Maintenance Network	351.22	0.143
Desktop	819.512	0.334
Ups Central	24.898	0.01
Total		0.669

4.2.3 Manpower Need

Below is the summary of FTE index calculation:

Table 4.57 FTE Index Summary

No	Position	FTE Index	Category
1	Human Capital Officer	0.792	Underload
2	General Service GL	1.276	Fit
3	Community Development Officer	2.088	Overload
4	Plant People development	0.968	Underload

5	Plant Hauling GL	1.336	Overload
6	Plant Engineer	1.107	Fit
7	Tyre GL	1.234	Fit
8	Planner	1.062	Fit
9	SSE GL	1.364	Overload
10	Warehouse GL	1.523	Overload
11	Inventory & Purchasing GL	1.531	Overload
12	Mine Infrastructure Engineer	1.508	Overload
13	Data Analyst	1.055	Fit
14	Road Maintenance GL	2.143	Overload
15	GL Hauling	1.753	Overload
16	Operation Site Instructor	1.321	Overload
17	SHE Site Leader	1.238	Fit
18	ICT Officer	0.669	Underload

Below is the formulation to calculate the appropriate amount of manpower

$$\text{Manpower need} = \text{Roundup}\left(\frac{\text{Current manpower} \times \text{Average Index}}{1.28}\right)$$

Table 4.58 Proposed FTE Index

No	Position	FTE Index	Current Manpower	Proposed Manpower	Proposed FTE Index	Category
1	Human Capital Officer	0.792	1	1	0.792	Underload
2	General Service GL	1.276	1	1	1.276	Fit
3	Community Development Officer	2.088	1	2	1.044	Fit

4	Plant People development	0.968	4	4	0.968	Underload
5	Plant Hauling GL	1.336	6	7	1.145	Fit
6	Plant Engineer	1.107	3	3	1.107	Fit
7	Tyre GL	1.234	3	3	1.234	Fit
8	Planner	1.062	3	3	1.062	Fit
9	SSE GL	1.364	3	4	1.023	Fit
10	Warehouse GL	1.523	1	2	0.761	Underload
11	Inventory & Purchasing GL	1.531	1	2	0.766	Underload
12	Mine Infrastructure Engineer	1.508	2	3	1.006	Fit
13	Data Analyst	1.055	1	1	1.055	Fit
14	Road Maintenance GL	2.143	2	4	1.071	Fit
15	GL Hauling	1.753	12	17	1.238	Fit
16	Operation Site Instructor	1.321	6	7	1.133	Fit
17	SHE Site Leader	1.238	4	4	1.238	Fit
18	ICT Officer	0.669	1	1	0.669	Underload

Based calculation FTE for each position, additional manpower needed is 13 supervisors.

Table 4.59 FTE Index for each Department

Dept	No	Positions	FTE Index	Category
Plant & SM	1	Plant People development	1.266	Fit
	2	Plant Hauling GL		
	3	Plant Engineer		

Dept	No	Positions	FTE Index	Category
	4	Tyre GL		
	5	Planner		
	6	Warehouse GL		
	7	Inventory & Purchasing GL		
	8	SSE GL		
HRM & Eng	9	Mine Infrastructure Engineer	1.681	Overload
	10	Road Maintenance GL		
	11	Operation Site Instructor		
	12	GL Hauling		
	13	Data Analyst		
HCGS	14	Human Capital Officer	1.386	Overload
	15	General Service GL		
	16	Community Development Officer		
SHE	17	SHE Site Leader	1.224	Fit
ICT	18	ICT Officer	0.699	Underload

Table 4.60 Manpower Need each Department

Dept	FTE Index	Current Manpower	Manpower Need

Plant & SM	1.266	24	24
HRM & Eng	1.556	23	28
HCGS	1.386	3	4
SHE	1.224	4	4
ICT	0.669	1	1

Based calculation FTE for each Department, additional manpower needed is 6 Supervisors.

4.2.4 Fishbone Diagram

After determining the workload category of each position based on FTE, the next step is to create a fishbone diagram to analyse the cause.

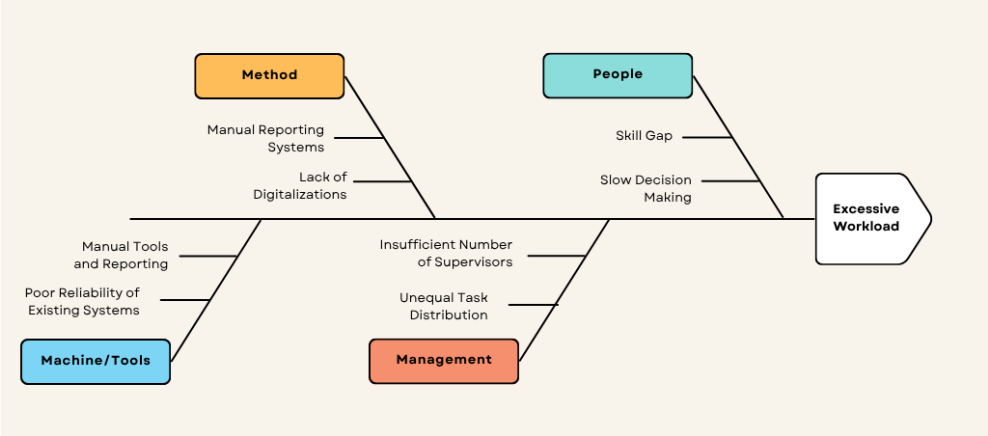


Figure 4.1 Fishbone Diagram

CHAPTER V
DISCUSSION

5.1 Full Time Equivalent analysis

5.1.1 Allowance

The allowance assessment shows that there are differences between office work and field work due to varying working conditions. In the office setting, the total allowance is 18%, consisting of constant allowances such as personal needs (5%) and basic fatigue (4%), combined with variable allowances including bad lighting (2%), mental strain from complex tasks (4%), monotony of medium intensity (1%), and intermittent noise (2%). These allowances reflect the relatively controlled environment of office work, where external factors are minimal.

In contrast, the field allowance is significantly higher at 30%. While the constant allowances remain the same (5% personal and 4% fatigue), the variable allowances increase due to harsher environmental conditions. Factors such as bad lighting (2%), complex mental strain (4%), atmospheric conditions (10%), and intermittent but very loud noise (5%) contribute to higher fatigue and performance reduction in the field. This higher allowance indicates that field supervisors require more recovery time and adjustments to maintain productivity under challenging operational conditions.

The comparison between the two tables highlights that field supervisors face heavier physical and environmental demands than office supervisors, thus justifying the higher total allowance. This differentiation ensures that the calculation of standard time for each type of work is realistic and aligned with actual working conditions.

5.1.2 FTE Index

The results of the Full-Time Equivalent (FTE) analysis in Table 4.58 show a variation in workload distribution across different positions. Several positions fall into the underload category, such as Human Capital Officer (0.792), Plant People Development (0.968), and ICT Officer (0.669). This indicates that these positions have less workload than the standard, suggesting potential inefficiencies or opportunities to optimize by redistributing tasks.

On the other hand, some positions are classified as fit, meaning their workload is within the acceptable range. These include General Service GL (1.276), Plant Engineer (1.107), Tyre GL (1.234), Planner (1.062), Data Analyst (1.055), and SHE Site Leader (1.238). The fit category reflects an ideal workload balance where employees can perform effectively without being overburdened.

However, a significant number of positions are categorized as overload, such as Community Development Officer (2.088), Plant Hauling GL (1.336), SSE GL (1.364), Warehouse GL (1.523), Inventory & Purchasing GL (1.531), Mine Infrastructure Engineer (1.508), Road Maintenance GL (2.143), GL Hauling (1.753), and Operation Site Instructor (1.321). These high FTE values indicate that employees in these positions are experiencing excessive workload, which may lead to fatigue, reduced performance, or even work accidents if not properly addressed.

Overall, the findings highlight the need for workload redistribution and manpower planning. Positions with underload can be given additional responsibilities, while those in overload categories may require task delegation, additional staff, or process improvements. This balancing effort is essential to enhance efficiency, maintain employee well-being, and ensure organizational performance remains optimal.

5.2 Fishbone Diagram Analysis

5.2.1 People

- **Skill gap among supervisors:**
  The varying levels of knowledge and competence among supervisors cause inefficiencies in task completion. Some supervisors lack adequate technical or managerial skills, leading to longer processing times, rework, and dependency on others. This skill imbalance increases the total workload for more capable supervisors who must often provide additional support or corrections.

- **Slow decision-making and poor time management:**
  Supervisors who struggle to prioritize tasks or make timely decisions often create workflow bottlenecks. This delay cascades through the operational chain, causing

overtime and reduced productivity. Ineffective time management also leads to stress and fatigue, lowering overall performance.

Solutions:

- **Conduct targeted training programs to enhance technical and managerial skills.**

  Improving supervisors' competencies through targeted training is essential to minimizing performance gaps. Training should focus on both technical aspects, such as field operation procedures, safety protocols, and productivity monitoring, and managerial aspects, including leadership, communication, and conflict management. Well-trained supervisors can complete tasks more efficiently, make better decisions under pressure, and reduce delays caused by uncertainty or inadequate skills.

- **Provide leadership and decision-making workshops for supervisory staff.**

  Workshops can strengthen supervisors' ability to make effective and timely decisions, especially in dynamic operational environments. By enhancing their analytical and leadership capabilities, supervisors can respond faster to on-site problems and delegate work more strategically. This initiative also nurtures confidence and autonomy, reducing dependence on upper management for minor operational decisions.

- **Implement a mentoring system where senior supervisors guide less experienced ones.**

  Mentoring connects experienced supervisors with less experienced ones, creating a knowledge-sDayng culture. This system helps new supervisors adapt more quickly, understand company standards, and learn efficient work practices. Over time, mentoring reduces skill discrepancies and builds a cohesive and supportive supervisory community.

- **Monitor performance regularly using Key Performance Indicators (KPIs) related to efficiency.**

Establishing KPIs allows management to measure efficiency, responsiveness, and quality of supervision. By setting clear performance metrics—such as task completion time, reporting accuracy, and compliance levels—the company can monitor progress objectively and identify individuals or areas needing further improvement.

5.2.2 Methods

- **Manual reporting system:**

  Reporting processes that rely on handwritten forms or spreadsheets require a significant amount of time for data entry and validation. This manual method also increases the risk of errors and consumes time that could otherwise be spent on field supervision or decision-making.

- **Lack of Digitalization:**

  Many operational and administrative processes remain non-digital, creating inefficiencies in communication, task assignment, and performance tracking. The absence of digital platforms for data sDayng and monitoring causes delays in information flow and reduces overall coordination effectiveness. This lack of digital integration prevents real-time visibility of workloads and contributes to excessive administrative burden on supervisors.

Solutions:

- **Implement digital reporting tools** or dashboards for real-time progress tracking.

  Replacing manual reporting with digital systems significantly reduces administrative burden. Through dashboards or mobile-based applications, supervisors can submit real-time data, track progress, and identify operational issues immediately. This automation not only saves time but also enhances transparency and decision-making accuracy.

- Implement an integrated digital system.

  To overcome this issue, the company should implement an integrated digital system that automates reporting, scheduling, and task monitoring. By introducing a centralized digital platform, supervisors can input data, track progress, and generate

reports in real time, reducing administrative burden and improving overall work efficiency.

5.2.3 Machines / Tools

- **Manual tools and reporting:**

  The continued use of non-digital tools such as paper-based forms or basic spreadsheets hinders efficiency. Manual systems slow down information flow and limit the ability to monitor operations in real time. This outdated approach adds administrative burden and delays data-driven decision-making.

- **Poor reliability of existing systems:**

  The current digital tools are often outdated or unreliable, leading to frequent technical issues and user frustration. These disruptions discourage consistent usage, forcing supervisors to revert to manual methods. As a result, productivity and data accuracy decline further.

Solutions:

- **Upgrade or modernize digital tools used by supervisors.**

  The company needs to equip supervisors with updated technology such as tablets, mobile applications, or integrated monitoring tools. These devices simplify data entry, report submission, and task coordination, reducing manual effort and human error.

- **Ensure system reliability through regular maintenance and updates.**

  Regular maintenance and timely updates are crucial for preventing system failures and downtime. Reliable systems ensure continuous data flow and accurate information, allowing supervisors to make timely decisions without disruption.

- **Provide user training to improve digital adoption among supervisors.**

  Transitioning from manual to digital tools requires user adaptation. Conducting periodic training ensures that supervisors are comfortable using new systems, increasing efficiency and user satisfaction. It also helps reduce resistance to technological changes among the workforces.

5.2.4 Management

- **Insufficient number of supervisors:**

  The number of supervisors currently available is not proportional to the workload volume, as confirmed by the FTE analysis. Each supervisor is responsible for overseeing multiple processes and workers beyond their capacity. This condition causes overload, reduces monitoring quality, and increases the risk of operational errors.

- **Unequal task distribution:**

  Tasks are not allocated based on workload data or job complexity, resulting in an imbalance where some supervisors are overburdened while others are underutilized. This inconsistency reduces morale and creates inefficiency in the overall supervision process.

Solutions:

- **Hire additional supervisors to balance the workload based on the FTE results**.

  According to the FTE analysis, the company currently has fewer supervisors than required. Recruiting 6 additional supervisors will distribute the workload more evenly and improve oversight quality. This measure not only reduces fatigue among existing staff but also strengthens safety supervision and reduces the likelihood of operational errors.

- **Redefine task allocation and boundaries for each supervisor to ensure fairness**.

  Clear job boundaries prevent overlapping responsibilities and confusion. By defining which tasks fall under each supervisor's control, the company can avoid redundancy, improve accountability, and enhance focus on core duties. This reallocation also ensures every supervisor contributes proportionally to the overall workload.

- **Reprioritize and delegate tasks**

  Supervisors should focus on strategic and decision-making functions, while routine or clerical tasks can be delegated to administrative assistants or digital tools. Task

prioritization ensures that supervisors' efforts are concentrated on high-impact activities, such as performance control, safety monitoring, and coordination.

CHAPTER VI
CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Based on the Workload analysis using FTE method, and root cause analysis using fishbone diagram, the conclusion of this study are:

1. Several positions fall into the underload category, such as Human Capital Officer (0.792), Plant People Development (0.968), and ICT Officer (0.669). This indicates that these positions have less workload than the standard, suggesting potential inefficiencies or opportunities to optimize by redistributing tasks. On the other hand, some positions are classified as fit, meaning their workload is within the acceptable range. These include General Service GL (1.276), Plant Engineer (1.107), Tyre GL (1.234), Planner (1.062), Data Analyst (1.055), and SHE Site Leader (1.238). The fit category reflects an ideal workload balance where employees can perform effectively without being overburdened. However, a significant number of positions are categorized as overload, such as Community Development Officer (2.088), Plant Hauling GL (1.336), SSE GL (1.364), Warehouse GL (1.523), Inventory & Purchasing GL (1.531), Mine Infrastructure Engineer (1.508), Road Maintenance GL (2.143), GL Hauling (1.753), and Operation Site Instructor (1.321).
2. Based on the root cause analysis, the excessive workload is experienced by the supervisory level at PT. XYZ is primarily caused by a combination of people, method, machine/tools, and management factors. From the people aspect, variations in skill levels among supervisors and weak time management lead to inefficiencies and delays in task completion. The method aspect reveals that manual reporting processes and the lack of digitalization significantly contribute to administrative overload and communication bottlenecks. In the machine/tools aspect, the continued reliance on manual systems and the poor reliability of existing digital tools hinder real-time monitoring and productivity. Meanwhile, from the management aspect, the insufficient number of supervisors and unequal task distribution result in an imbalanced workload where some supervisors are excessively burdened. Altogether, these factors create a

cumulative effect that increases processing time, reduces efficiency, and elevates the overall workload intensity at the supervisory level.

6.2 Suggestions

Based on the course of this research, several valuable insights have been gained. These lessons can serve as reflections and be applied to guide and improve future studies.

1. The current study may focus only on specific departments or job roles. It is suggested that future research expand across multiple sites or departments within the company to provide a broader picture of workload conditions and required interventions.
2. Future research may include a more comprehensive economic evaluation by considering not only the cost of hiring additional supervisors but also potential savings from reduced accident rates, improved efficiency, and better employee retention.

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APPENDIX

ILO ALLOWANCE TABLE

Table: ILO Recommended Allowances			
A.	Constant allowances:		
	1 Personal allowance		5
	2 Basic fatigue allowance		4
B.	Variable allowances:		
	1 Standing allowance		2
	2 Abnormal position allowance:		
	a.	Slightly awkward	0
	b.	Awkward (bending)	2
	c.	Very awkward (lying, stretching)	7
	3 Use of force, or muscular energy (lifting, pulling, or pushing):		
	Weight lifted, pounds:		
		5	0
		10	1
		15	2
		20	3
		25	4
		30	5
		35	7
		40	9
		45	11
		50	13
		60	17
		70	22
	4 Bad light:		
	a.	Slightly below recommended	0
	b.	Well below	2
	c.	Quite inadequate	5
	5 Atmospheric conditions (heat and humidity)- variable		0-100
	6 Close attention:		
	a.	Fairly fine work	0
	b.	Fine or exacting	2
	c.	Very fine or very exacting	5
	7 Noise level:		
	a.	Continuous	0
	b.	Intermittent - loud	2
	c.	Intermittent - very loud	5
	d.	High-pitched - loud	5
	8 Mental strain:		
	a.	Fairly complex process	1
	b.	Complex or wide span of attention	4
	c.	Very complex	8
	9 Monotony:		
	a.	Low	0
	b.	Medium	1
	c.	High	4
	10 Tediousness:		
	a.	Rather tedious	0
	b.	Tedious	2
	c.	Very tedious	5