THE AHP APPROACH TO DETERMINE CONTRACT SERVICE STRATEGY DETERMINATION TO OPTIMIZE FIXED COAL PLANTS AVAILABILITY

A case study in a coal mining company in East Kutai

FINAL PROJECT

In partial fulfilment of the requirements
for the master's degree
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(Master of Business Administration Program)

INSTITUT TEKNOLOGI BANDUNG
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ABSTRACT

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PTKPC, a coal producer, was facing challenges due to a permit transition in December 2021 from Coal Mining Contract of Work (PKP2B) to Special Mining Business License (IUPK). This change increases operational costs with added royalty rates, value-added tax, and profit-sharing obligations. To address this issue, the company decided to streamline contractors in each department in all business units, consolidating various tasks under one umbrella contract. The goal is to provide a big volume of work, potentially lowering rates and reducing PTKPC's operational costs. However, relying on a single contractor for crucial operations, as seen in the Coal Terminal Maintenance Department (CTMD), introduces risks. The sole contract winner, PTPB, struggles to meet obligations since the contract's initiation on December 1, 2021. The average contract fulfillment since commencement date is 86% of 100% desired target, disrupting fixed plant Coal Terminal maintenance activities. Physical availability is 93%, below the 94% target, increasing CTMD's maintenance costs by $0.059 per ton. This research seeks to identify the root causes of PTPB's inability to fulfill contractual duties and explore alternative solutions. and then from all the existing alternatives, what is the best alternative in responding to this condition. Utilizing primary and secondary data from PTPB's monthly proforma invoices, contract scope, and CTMD's monthly reports, the research employs methodologies like problem tree analysis and stakeholder analysis to unravel business complexities and identify root cause of the problems. Qualitative data collection methods, including focused group discussions (FGD) and semi-structured interviews, will be used to determine alternatives. These alternatives will be assessed using the Value-Focused Thinking (VFT) methodology. The Analytic Hierarchy Process (AHP) methodology, assisted by the AHP Super Decision application, will determine the best alternative: the "Implementation of Warnings and Penalties to PTPB". Implementing this alternative demonstrates PTKPC's commitment to stakeholders, ensuring contractor accountability without disrupting fixed plant maintenance. Penalty funds will support CTMD's financial viability, funding additional resources for tasks beyond PTPB's capacity. This strategy may be applied to other contracts within PTKPC.

Keywords: Coal mining, Contractor, Problem tree, VFT, AHP, Super Decisions

ABSTRAK

PENDEKATAN AHP DALAM MENENTUKAN STRATEGI KONTRAK SERVICE UNTUK MENGOPTIMALKAN KEMAMPUAN KONTRAKTOR DALAM MENJAGA KETERSEDIAAN FIXED PLANT

A case study in a coal mining company in East Kutai

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PTKPC, sebagai produsen batu bara, menghadapi tantangan akibat perubahan izin dari PKP2B ke IUPK pada Desember 2021. Peningkatan biaya operasional karena tambahan tarif royalti, pajak nilai tambah, dan kewajiban pembagian keuntungan yang sebelumnya tidak ada, mendorong perusahaan untuk mengambil langkah strategis. Salah satu strategi yang diadopsi adalah merampingkan kontraktor di setiap departemen, menggabungkan berbagai pekerjaan ke dalam satu kontrak untuk menekan tarif dan mengurangi biaya operasional. Meskipun berpotensi mendapatkan tarif lebih rendah, pendekatan ini memberikan risiko ketergantungan pada satu kontraktor, terlihat jelas di Coal Terminal Maintenance Department (CTMD). PTPB, sebagai pemenang kontrak tunggal, kesulitan memenuhi kewajiban kontrak sejak awal, mencapai hanya 86% pemenuhan kontrak dan mengganggu aktivitas perawatan fixed plant Coal Terminal. Biaya perawatan CTMD juga meningkat sebesar $0,059 per ton. Penelitian ini dilakukan untuk mengidentifikasi akar permasalahan ketidakmampuan PTPB memenuhi kontrak dan mencari solusi alternatif. Data primer dan sekunder, seperti invoice proforma bulanan PTPB, ruang lingkup kontrak, dan laporan bulanan CTMD, menjadi dasar untuk analisis. Metodologi penelitian melibatkan analisis pohon masalah dan pemangku kepentingan untuk mengungkap kompleksitas bisnis dan menemukan akar permasalahan. Pengumpulan data kualitatif dilakukan melalui diskusi kelompok terfokus (FGD) dan wawancara semi-terstruktur. Seluruh alternatif dievaluasi dengan Value-Focused Thinking (VFT), dan metode Analytic Hierarchy Process (AHP) digunakan untuk menentukan alternatif terbaik yang dibantu oleh aplikasi super decision. Hasilnya menunjukkan bahwa "Pemberian Peringatan dan Pinalti kepada PTPB" adalah alternatif terbaik. Menerapkan alternatif ini akan menegaskan ketegasan PTKPC kepada seluruh pemangku kepentingan tanpa mengganggu perawatan dan ketersediaan fixed plant di Coal Terminal. Dana dari pinalti juga dapat membantu CTMD membiayai sumber daya tambahan untuk menutupi pekerjaan yang tidak dapat dilakukan PTPB. Strategi ini berpotensi diterapkan pada kontrak lain di PTKPC, memastikan biaya perawatan tetap ekonomis sambil menjaga produktivitas dan kualitas layanan.

Keywords: Coal mining, Kontraktor, Pohon masalah, VFT, AHP, Super Decisions

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Bandung, 22 Januari 2024

Akim Tua

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LIST OF ABBREVIATIONS AND SYMBOLS

ABREVIATIONS	Name	Page of initial usage
IUP	Izin Usaha Pertambangan	2
IUPK	Izin Usaha Pertambangan Khusus	2
PKP2B	Perjanjian Kerja Sama Pengusahaan Pertambangan Batubara	2
PPN	Pajak Pertambahan Nilai	2
BA	Bukit Asam	4
BP	British Petroleum	4
CEO	Chief Executive Officer	6
COO	Chief Operating Officer	6
CFO	Chief Financial Officer	6
GM	General Manager	6
CMD	Contract Mining Division	6
HSES	Health Safety Environment and Security	6
MOD	Mining Operation Division	6
MSD	Mining Support Division	6
CPHD	Coal Processing and Handling Division	6
MDD	Mining Development	6
BPID	Business Performance & Improvement Division	6
SCD	Supply Chain Division	6
GFIN	Finance Division	6
MKTD	Marketing Division	7
HRD	Human Resources Division	7
ESD	External Affairs and Sustainable Division	7
LEG	Legal Division	7
MDD	Mining Development Division	7
CCP	Coal Chain Process	9
CPP	Coal Processing Plant	9
CQC	Coal Quality Control	9
CTMD	Coal Terminal Maintenance Department	11
OB	Over Burden	11
BOD	Board of Director	12
OLC	Over Land Conveyor	13
CTOD	Coal Terminal Operation Department	14
LTT	Lubuk Tutung	15
Mtpa	Million Metric Tons Per Annum	17
TPH	Tons Per Hour	17

Mt	Metric tons	17
SP	stockpiles	18
FTS	Floating Transfer Station	18
FCS	the Floating Crane System	18
CT	Coal Terminal	21
LS	Labor Supply	22
CS	Contract Service	22
ICI	Indonesia Coal Index	23
NEX	Newcastle Export Index	23
GCNC	Global Coal Newcastle Index	23
PA	Physical Availability	25
CONT	Contract department	30
FIN	Finance department	31
VFT	Value-Focused Thinking	33
AHP	Analytic Hierarchy Process	33
FGD	Focused Group Discussions	33
KT	Kepner-Tregoe	35
NGO	Non-governmental organizations	38
OCA	Objectives, Criteria, Alternatives	45
HIRADC	Hazard Identification, Risk Assessment and Determining Control	45
FAHP	Fuzzy Analytical Hierarchy Process	54
IPMS	Integrated Performance Measurement System	56
KPI	Key Performance Indicators	61
MTTR	Mean time to repair	96
MTBF	Mean time between failures	96
OPEX	Operational Expenditure	96
KP	key person	97

SYMBOLS	Name	Page of initial usage
$\bar{\bar{\boldsymbol{x}}}$	Average of the average value of interest	65
$\bar{\bar{\boldsymbol{Y}}}$	Average of the average value of power	65
k	Number of stakeholders involved	66
n	Number of items being compared	66
Xi	Value of the i-th interest level	66
Yi	Value of the i-th power level	66
$\bar{X}$	Average value of interest	66
$\bar{Y}$	Average value of power	66
CI	Consistency Index	74
CR	Consistency Ratio	74
RI	Random Index	74

Chapter I Introduction

Currently, Indonesia is among the top 5 largest coal-producing countries in the world. Based on the latest data from the Ministry of Energy and Mineral Resources, Indonesia's coal reserves amount to approximately 38.84 billion tons, with the majority located in Kalimantan, accounting for about 62.1% of the total potential reserves. This makes it the largest source of coal resources in Indonesia, with a total of 88.31 billion tons in resources and 25.84 billion tons in reserves. Sumatra follows with 55.08 billion tons in resources and 12.96 billion tons in reserves. With an average coal production of around 600 million tons per year, it is estimated that these coal reserves can last for approximately 65 years, assuming no new reserves are discovered.

Therefore, the government continues to encourage efforts to utilize these resources to bring prosperity to all Indonesian society. Coal mining remains a crucial part of Indonesia's energy supply, offering affordable energy solutions. From the Figure 1.1, from 2015 to 2017, Indonesia's coal production exceeded 450 million tons and continued to increase until 2022, reaching 685 million tons. Sales include both domestic and export markets. For the current year, 2023, production has already reached 517 million tons, with the majority still being exported at 240 million tons and absorbed in domestic at 176 million tons.

Figure 1. 1 Realization of Coal Production & Sales of Indonesian

(Source: Kementerian Energi dan Sumber Daya Mineral)

The abundance of these reserves has led to the growth of mining companies in Indonesia. To regulate these mining activities and ensure they remain controlled while providing significant benefits to the well-being of the Indonesian people, the government manages coal mining permits through several licensing mechanisms such as Mining Business License (Izin Usaha Pertambangan or IUP), Special Mining Business License (Izin Usaha Pertambangan Khusus or IUPK), and Coal Mining Cooperation Work Agreement (Perjanjian Kerja Sama Pengusahaan Pertambangan Batubara or PKP2B). Many of PKP2B agreements have been converted into IUP or IUPK to increase regional and national revenue by incorporating specific regulations and additions such as profit-sharing obligations, additional tax on price differences, Value Added Tax (PPN), corporate income tax, and royalty rate adjustments, as shown in next Table 4.1.

I.1 Background

PTKPC is one of the largest individual coal mines from Indonesia, situated within Sangatta, East Kutai, in the province of East Borneo. Its geographic coordinates span from 117° 27' 7.40" to 117° 40' 43.40" east longitude and 0° 31' 20.52" to 0° 52' 4.60" north latitude. PTKPC's precise location is approximately 180 kilometres northeast of Samarinda and 310 kilometres to the north-east of Balikpapan as shown in the Figure 1.2 below.

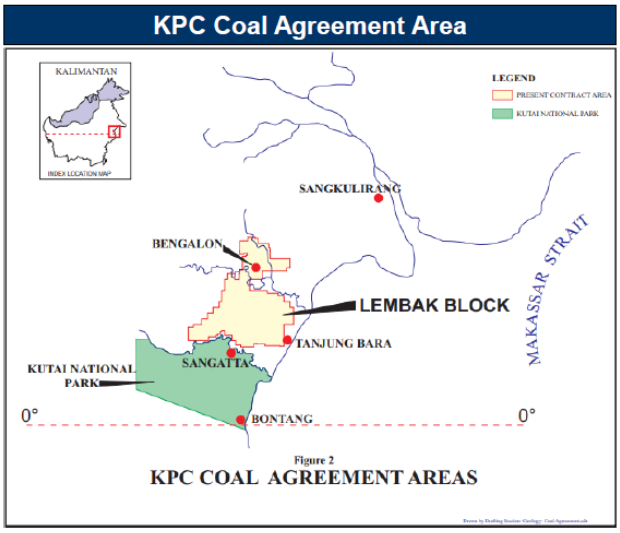


Figure 1. 2 PTKPC Coal Agreement Area

(Source: Internal data)

PTKPC held a coal contract of work (known as Perjanjian Karya Pengusahaan Pertambangan Batubara or PKP2B) with reference number J2/Ji. D4/16/82, initially executed on April 8, 1982. In December 2021, this contract underwent a transition to an Izin Usaha Pertambangan Khusus (IUPK) under License No. 90/1/IUP/PMA/2021.Under the previous PKP2B contract, PTKPC was granted a concession area spanning 84,938 hectares. However, with the new IUPK contract, the area has been reduced to 61,543 hectares. PTKPC operates as a subsidiary of PTBR Tbk, with its principal office and business location situated at Wisma Bakrie 2, 9th Floor, Jln HR Rasuna Said Kav B2, Jakarta 12920.

The mining operations encompass both the Sangatta project and the Bengalon project, each equipped with its coal-shipping infrastructure. The transportation of coal from the Sangatta project to the port is facilitated through conveyor belts, while for the Bengalon project, road transport is utilized. In Figure 1.3, it is explained that since operating in 1992 with a total of 7.3 million metric tons of coal mined, PTKPC production has continued to increase. In the eighth year of operation in 1999, there was a 96% increase in production from the start of operation, at 14.3 million tons, and PTKPC only needed the next 6 years to double that production, at 28.3 million tons in 2005.

After that point, PTKPC continued to increase its production year after year until 2011, when it was able to reach 41.1 million tons. PTKPC did not just stop there; in 2014, PTKPC recorded production reaching more than 50 million tons, and in 2019, it became a historical milestone in achieving PTKPC's highest production, at 60.8 million tons. This achievement follows the maximum capacity of the coal transportation system, which is the overland conveyor. The production projection for 2023 is 55 million tons. This significant production growth has made PTKPC one of the largest mining companies in Indonesia.

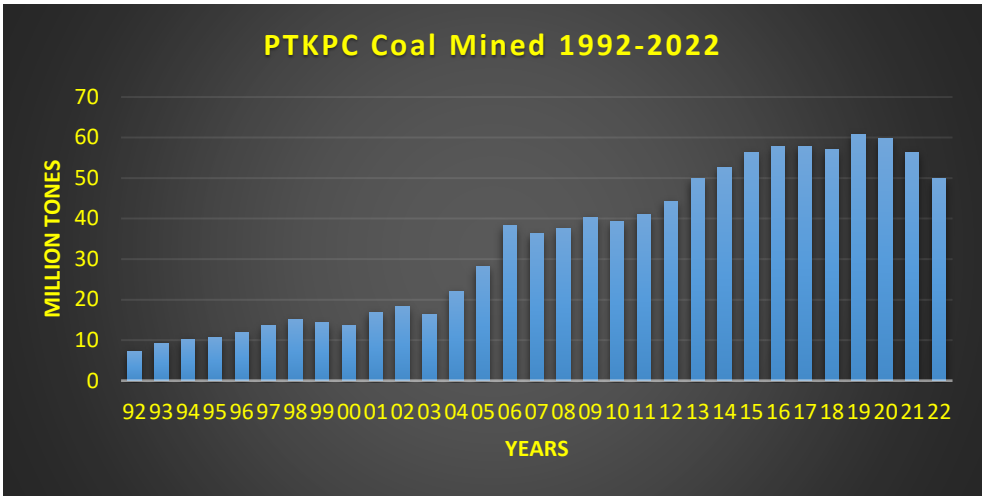


Figure 1. 3 Coal and OB Mined 1992-2023 Plan

(Source: Internal data)

I.2 Company Profile

The negotiations between PTKPC and the Indonesian government started in late 1978 and were completed in 1982. The Indonesian State Coal Company, Perum Tambang Batubara (now known as PT Tambang Batubara Bukit Asam or PT. BA), and a company established in Indonesia, in collaboration with British Petroleum International Ltd. (BP) and Conzinc Rio Tinto of Australia Ltd. (Rio Tinto), entered into a coal agreement on April 8, 1982. This agreement, which governs PTKPC's operations, covers a 30-year production period for the exploration, production, and sale of coal from the East Kalimantan Agreement Area.

Ownership of PTKPC subsequently transferred to an Indonesian company named PTBR Tbk in 2003, following the complete divestment of their ownership by Rio Tinto and British Petroleum. PTBR Tbk. was established in 1973 and is a publicly listed company on the Jakarta Stock Exchange and in Surabaya. Under PTBR Tbk's management, PTKPC's production figures underwent significant changes, reaching 40.3 million tons in 2009, only seven years after it took over, and steadily increasing year by year. seven years later, PTKPC production increased to 52.7 million tons in 2014, and within five years, in 2019, it reached a milestone by making the highest production of 60.8

million tons, as shown in Figure 1.3 above. This increase was achieved through various improvements, including the expansion of mining equipment, capacity enhancements for crushers, the doubling of conveyor systems, speed upgrades to the trestle, ship loading, and barge loading facilities in Sangatta and Bengalon, an augmented workforce, particularly operators, and the Implementation of a two 12-hour shift system to reduce the loss of change shift time, which was previously three shifts of 8 hours.

Vision, Mission, and Value

The core corporate strategy of PTKPC is encapsulated in its vision, which is to become "***Indonesia's leading coal producer for global needs delivering optimum values to all stakeholders***" This commitment is underscored by PTKPC's motto or slogan, "***More than Mining***" which signifies the company's prioritization of health, safety, environmental stewardship, community development, and meeting stakeholder requirements. It has evolved into the benchmark for PTKPC's adherence to sound mining practices and its capacity to create optimal value for the community, the nation, and the world. This vision is translated into five key missions:

1. Fostering a culture that considers health, safety, and environment in everything we do.
2. Maintaining good corporate governance and promoting good corporate citizenship.
3. Providing an environment for learning to achieve excellence and improve livelihood.
4. Optimizing value for all stakeholders.
5. Carrying out best practice in management and operations to deliver consistent high-quality product and performance.

To achieve this vision and mission, PTKPC has established seven core corporate values that are consistently communicated and instilled in all employees as guiding principles:

1. Excellence: holding all employees, contractors, and suppliers accountable for achieving best practices in everything we do.

2. Integrity: earning trust and respect by behaving in a fair, honest, and responsible way.
3. Transparency: striving to be open and honest in our conduct.
4. Agility: proactively adapting to dynamic situations by embracing new ideas and seizing opportunities.
5. Empowerment: developing employees and the local community by encouraging them to take initiatives, be innovative and become self-reliant.
6. Teamwork: achieving excellence through cooperation between management, employees, and partners.
7. Care: paying attention to the needs of stakeholders and ensuring those needs are addressed in a sustainable manner.

KPC Structure Organization

PTKPC is a subsidiary of PTBR Tbk, which holds 51% majority ownership and acts as the holding company for the corporation. There are fourteen divisions to run the PTKPC's business. The Chief Executive Officer (CEO) is in charge of the organization's management, which is assisted by the Chief Operating Officer (COO) and the Chief Financial Officer (CFO), as detailed below:

1. The Chief Operating Officer (COO) oversees six Division General Managers (GMs), namely:
    - GM Contract Mining Division (CMD)
    - GM Health Safety Environment and Security (HSES)
    - GM Mining Operation Division (MOD)
    - GM Mining Support Division (MSD)
    - GM Coal Processing and Handling Division (CPHD)
    - GM Mining Development (MDD)
2. The Chief Financial Officer (CFO) is responsible for three GMs Division:
    - GM Business Performance & Improvement Division (BPID)
    - GM Supply Chain Division (SCD)
    - GM Finance Division (GFIN)
3. Additionally, the CEO directly oversees five GMs Division:

- GM Marketing Division (MKTD)
- GM Human Resources Division (HRD)
- GM External Affairs and Sustainable Division (ESD)
- GM Legal Division (LEG)
- GM Mining Development Division (MDD)

The organizational structure of PTKPC is illustrated in Figure 1.4, and it is characterized by a simple division between operational and support functions. According to **Jacobs and Chase (2008: 6)**, operations refer to the processes used to transform the resources of employees within a firm into products and services desired by customers. Operational, which consists of six divisions, encompasses responsibilities for the entire mining process, encompassing tasks such as land clearing, topsoil removal, overburden removal, coal mining, coal processing, coal sales, and coal shipping that are led by the COO as per the red box mark on Figure 1.4.

The rest is the support division, which reports to the CFO or directly to the CEO, who is outside the red box. Supporting divisions, on the other hand, are responsible for ensuring the smooth operation of all activities. They provide essential services and data, including human resources services, permitting, financial, marketing, and legal aspects.

The total of 14 divisions in PTKPC, each headed by a General Manager (GM), oversees a network of 61 departments, each managed by a department manager who reports to their respective division or GM. Each department, in turn, supervises at least one section responsible for day-to-day operations. Currently, PTKPC boasts an employee count of approximately 4,034, supplemented by an additional workforce of approximately 21,000 contractors dedicated to supporting operations in Sangatta and Bengalon.

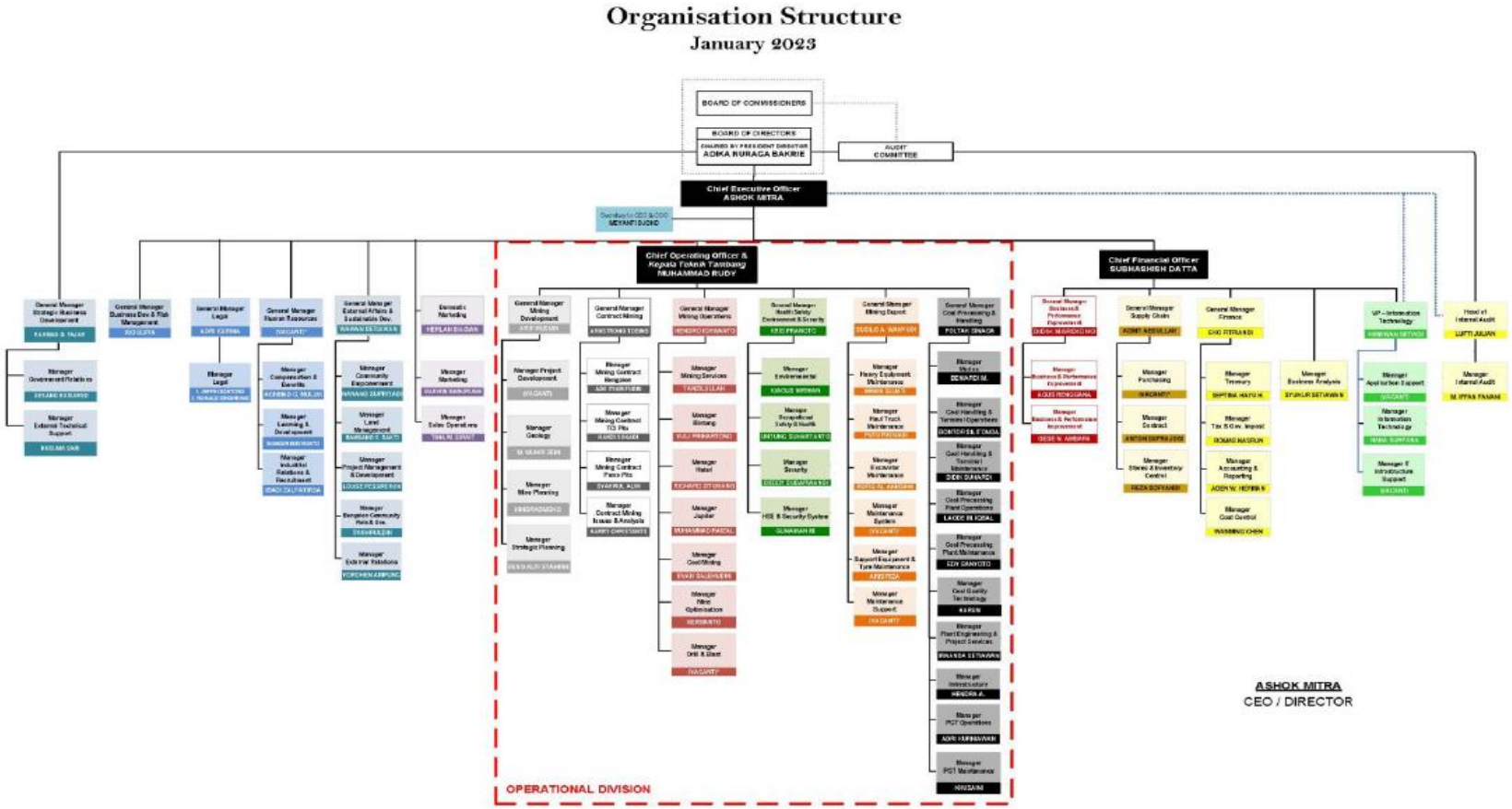


Figure 1. 4 PTKPC Organization Structure updated Jan 2023

(Source: Internal data)

PTKPC Business Process

PTKPC employs the open mining method, specifically utilizing trucks, backhoes, and shovels. The business processes at PTKPC can be succinctly categorized into three primary stages: mining preparation, production, and post-mining. The operational workflow spanning these stages is visually represented in Figure 1.5, which includes mining preparation from stages 1 (exploration survey) to stage 4 (pit design). In production, which is the core activity, there are several sequences that start from Land Clearing at stage 5 and continue until shipping activities in stage 14. Post-mining activities consist of Topsoil replacement, revegetation, and rehabilitation, explained in stages 15 to 16.

PTKPC's mining operations are divided into two distinct regions: the Sangatta area and the Bengalon area, as depicted in Figure 1.2, and have activities across more than 15 pits, employing both its in-house teams and contractors. Currently, four principal contractors collaborate with PTKPC for mining activities, namely PTTCI and PTPP in the Sangatta Area, as well as PTDH and PTM in the Bengalon Area.

In production activities, there is Coal Chain Process (CCP) activity starting from coal preparation stage 11 to shipping stage 14. These activities are the responsibility of the Coal Processing and Handling Division (CPHD), which is assigned to 5 departments, namely Coal Processing Plant Maintenance and Operation (2 departments), which is responsible for the coal chain process and maintenance activities from the crusher in-pit to the Coal Processing Plant (CPP) Stockpile, and Coal Terminal Maintenance and Operation (2 departments), which is responsible for the coal chain process from the CPP Stockpile to shipping. All of these activities will be controlled by one other department, namely the Coal Quality Control (CQC) Department. This research will focus on activities in coal terminal maintenance that support coal chain activities.

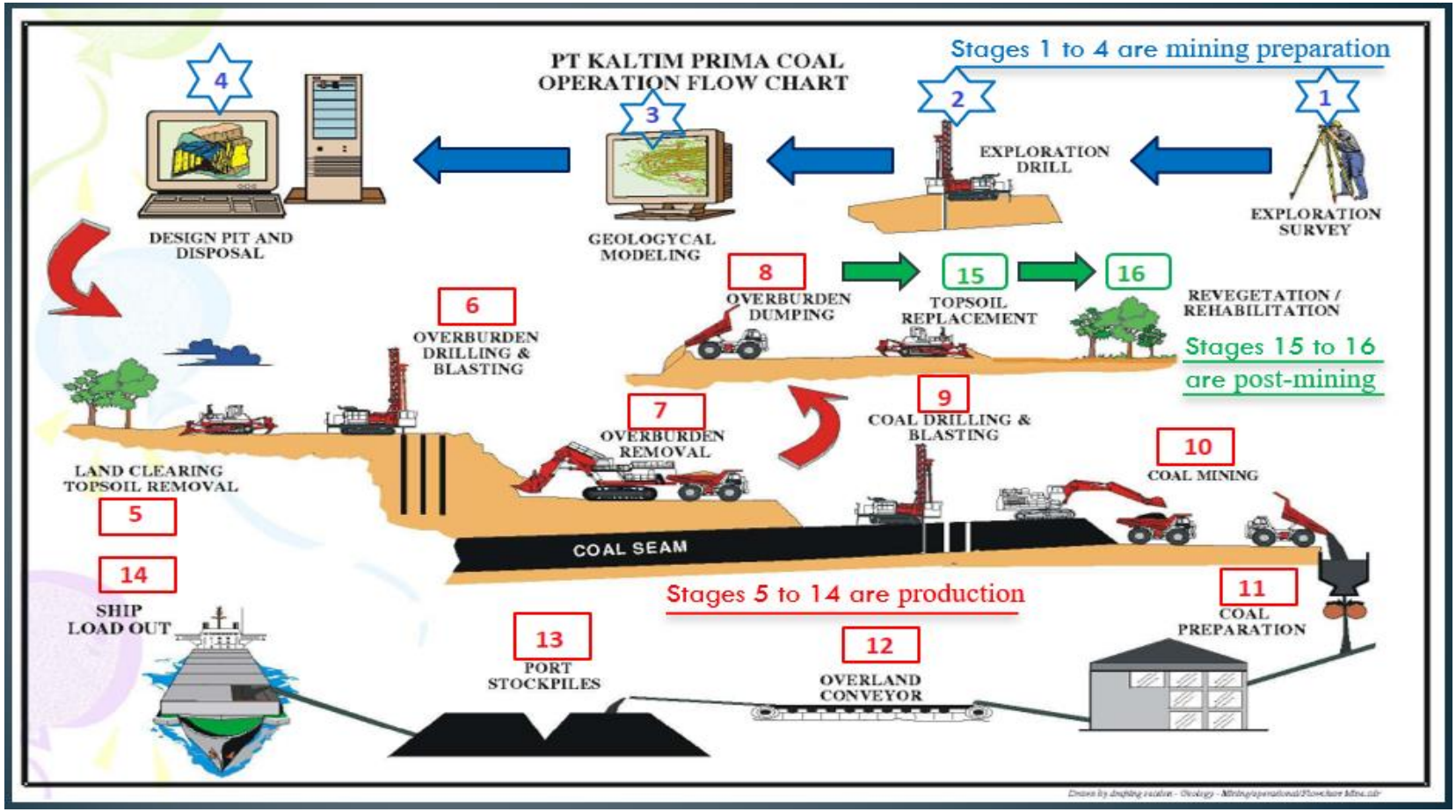


Figure 1. 5 PTKPC Business Stages

(Source: Internal data)

To clarify the operational scope and responsibilities of each division under the Chief Operating Officer (COO), refer to the Table 1.1 below, where the MDD, MOD, and MSD involve their divisions in exploration, drilling, modelling, and pit design as the mining preparation stages. Then, after getting the pit design, it continues with production activities, starting with land clearing and topsoil removal, drilling, blasting & removal of overburden continued by coal drilling & getting by MOD, CMD, and MSD. The focus of this research is on stages 13 to 14 related to coal conveyance and shipping which is called coal chain process. In these stages, the CPHD, through the Coal Terminal Maintenance Department (CTMD), ensures the availability of fixed plants to support the coal chain process. Meanwhile, for post-mining, it becomes MOD, CMD, and HSES responsibility. Details of the coal chain process will be explained after Table 1.1, including the fixed plant capacity, which determines and supports CCP activities.

Table 1. 1 Business processes at PTKPC

(Source: Internal data)

Stages		Activities	Responsibility
Mining preparation	1 2	Exploration Survey Exploration Drill	Mining Development (MDD) Mining Operation Division (MOD) Mining Support Division (MSD)
	3 4	Geological Modelling Pit Design	Mining Development (MDD)
Production	5 6 7-8 9-10	Land Clearing & TS Removal Drilling & Blasting OB Removal Coal Drilling and Getting	Mining Operation Division (MOD) Contract Mining Division (CMD) Mining Support Division (MSD)
	11-12 13-14	Coal Preparation Coal Convey & Shipping	Coal Processing and Handling Division (CPHD)
Post-mining	15-16	Topsoil replacement	Mining Operation Division (MOD) Contract Mining Division (CMD) Health Safety Environment and Security (HSES)

PTKPC Coal Chain Flow of Coordination

The Coal Chain Process (CCP) within PTKPC is a multifaceted system overseen by the Marketing Division, which acts as the primary customer interface for this process. The CCP comprises several distinct processes, each

managed by separate Divisions, each with their own specific targets. It is important to note that these processes are interdependent and cannot operate in isolation to achieve their respective objectives. They are closely intertwined, and their outputs are interconnected. The Marketing Division is one of the five Divisions that report directly to the CEO. Its role is pivotal in ensuring that the coal produced aligns with PTKPC's budget and meets the contractual agreements with coal buyers in terms of quantity, quality, and pricing. This Division is also responsible for maintaining a robust market for KPC's coal.

To accomplish this, the Marketing Division provides the Shipping Schedule to create long-term, mid-term, and short-term plans that integrate production forecasts with shipping schedules. Long-term planning entails developing one-year and five-year plans. The production forecast, derived from the Mining Operation Division (MOD) and Contract Mining Division (CMD), serves as the basis for creating the shipping program for the one-year period. This production forecast is then translated into coal crushing, coal delivery to the port, and ultimately, coal shipments, all in accordance with the established shipping schedule aligned with coal buyers' requirements. This production forecast also forms the basis for revenue projections, which are subsequently reviewed by the Finance Division and Business Analysis Department. If the revenue forecast aligns with expectations, it proceeds to the Chief Financial Officer (CFO) for reporting to the Board of Directors (BOD). In case of discrepancies, a coordination meeting is convened among CCP stakeholders to explore necessary adjustments to meet the company's objectives.

The Coal Quality Control (CQC) department, reporting to GM CPHD, is one of departments within its purview. This department plays a crucial role in orchestrating and monitoring the quantity, quality, and sequence of coal production to ensure optimal revenue generation. CQC collaborates extensively with Divisions throughout the CCP, including Mining Operation Division (MOD), Contract Mining Division (CMD), Mining Development Division (MDD), and Marketing Division. CQC's responsibilities span internal coordination within CPHD, involving the Coal Processing Plant (CPP) and

CTMD, to ensure crusher availability, allocation, Over Land Conveyor (OLC) availability, stockpile management, loading sequence for quality and quantity coordination, and out-loading allocation for coal production. It is noteworthy that CPP and CHT play pivotal roles within the coal chain process, as the seamless operation of all fixed plants is essential to connect the coal extraction from the mining and shipping at the Port. PTKPC's targets can only be met when all plant facilities are effectively maintained. Any issues, even in one plant, such as the Over Land Conveyor (OLC), can disrupt the entire process CCP, regardless of the efforts of MOD, CMD, or Marketing Division.

Coordination among CCP stakeholders is an ongoing process, with long-term (yearly and quarterly), mid-term (monthly and biweekly), and short-term (weekly, daily, shift, and hourly) planning and meetings in place. However, immediate action is taken whenever exigent circumstances demand it. To maintain real-time awareness of operations, including coal mining, coal crushing, and coal shipping, CQC operates on a continuous shift basis, ensuring 24/7 monitoring. CQC personnel are strategically positioned in key offices, such as the Coal Mining Office, Crusher Office, and Coal Terminal Office, to directly oversee conditions. Additionally, they are equipped with mobile phones to facilitate rapid information dissemination and decision-making based on real-time production or shipment conditions, both in Sangatta and Bengalon areas.

Table 1. 2 The CCP is a single process that interacts with other processes.

(Source: Internal data)

Activity	Responsible Division	Which process is related
Coal Mined	MOD CMD	Coal Crushed Coal Shipped
Coal Crushed	CPHD	Coal Mined Coal Conveyed Coal Shipped
Coal Conveyed	CPHD	Coal Crushed Coal Shipped

Activity	Responsible Division	Which process is related
Coal Shipped	CPHD Marketing Division	Coal Mined Coal Crushed Coal Conveyed
Vessel/Shipping scheduling	Marketing Division	Coal Mined Coal Crushed Coal Conveyed Coal Shipped

Table 1.2 illustrates the CCP flow as a single process along with the corresponding Division responsible for its management. The table reveals that a single process can serve as both an output and input for another process, thus indicating its integration. The seamless integration of these processes necessitates continuous coordination. Of the five activities examined, CPHD plays a significant role in CCP, spanning from the initial coal crushing stage to the final shipment. For coal crushed in CPHD, to ensure the crusher can operate at its maximum capacity of 8,000 tons per hour, it's determined by the Coal Mined process by MOD/CMD how much coal they can feed into the crusher hopper. Similarly, to make sure that the Coal Conveyed capacity through the overland conveyor can reach a maximum of 4,500 tons per hour as per the specifications, it's also determined by the output from the crusher as its upstream. Likewise, for its downstream, in achieving the planned coal shipped target, the marketing division also has to ensure the availability of vessels or barges. If these aspects are not managed well, no matter how efficiently coal is mined, crushed, and conveyed, the coal shipped target cannot be achieved if there are no vessel available for loading. Within CPHD, the CQC Department serves as the central controller for the entire CCP activity. It collaborates closely with four other departments: CPPO & CPPM and CTMD & CTOD to ensure alignment between the coal chain requirements, such as synchronizing shipping schedules with fixed plant maintenance schedules and the availability of coal product.

1. Coal Chain Process (CCP)

   The sequence of processes from coal exposure to shipment is referred to as the Coal Chain Process. The CCP is an interconnected series of independent processes, where the achievement of one process cannot be disregarded, as it impacts the successful completion of others. The flow of activities within the CCP is illustrated in Figure 1.6. CCP starting with coal coming from all mines in Sangatta and Bengalon, which are shown in number 1 with red arrows, red writing, and a green background, followed by coal conveyance or hauling from the mine to the crushing, as shown in number 2 with light blue arrows, red writing, and a blue background. After that, the coal will be processed through several crushing processes to produce product sizes according to market needs, as shown in number 3 with the orange arrow, which is then stacked in the CPP stockpile. The finished product will be conveyed to the Coal Terminal or Lubuk Tutung (LTT) stockpile, as shown in number 4, with a dark blue arrow, and then sent to the ship to be sent to the buyer.

   The conclusion coal chain process within PTKPC comprises several key stages (as depicted in Figure 1.6,). Initially, coal is excavated using backhoes, loaded onto trucks, and transported to the crusher, where it is crushed to a several sizes. The crushed coal is subsequently stockpiled at the Coal Processing Plant (CPP) Stockpile. From there, the crushed coal is directed to a hopper and then onto a twin overland conveyor, which conveys it to the Coal Terminal. If the quality of the coal matches the specifications required by the vessel, it is directly loaded onto the ship through the ship loading facility or onto the barge through the barge loading facility. However, if the coal quality does not meet the vessel's requirements, it is stockpiled at the Coal Terminal.

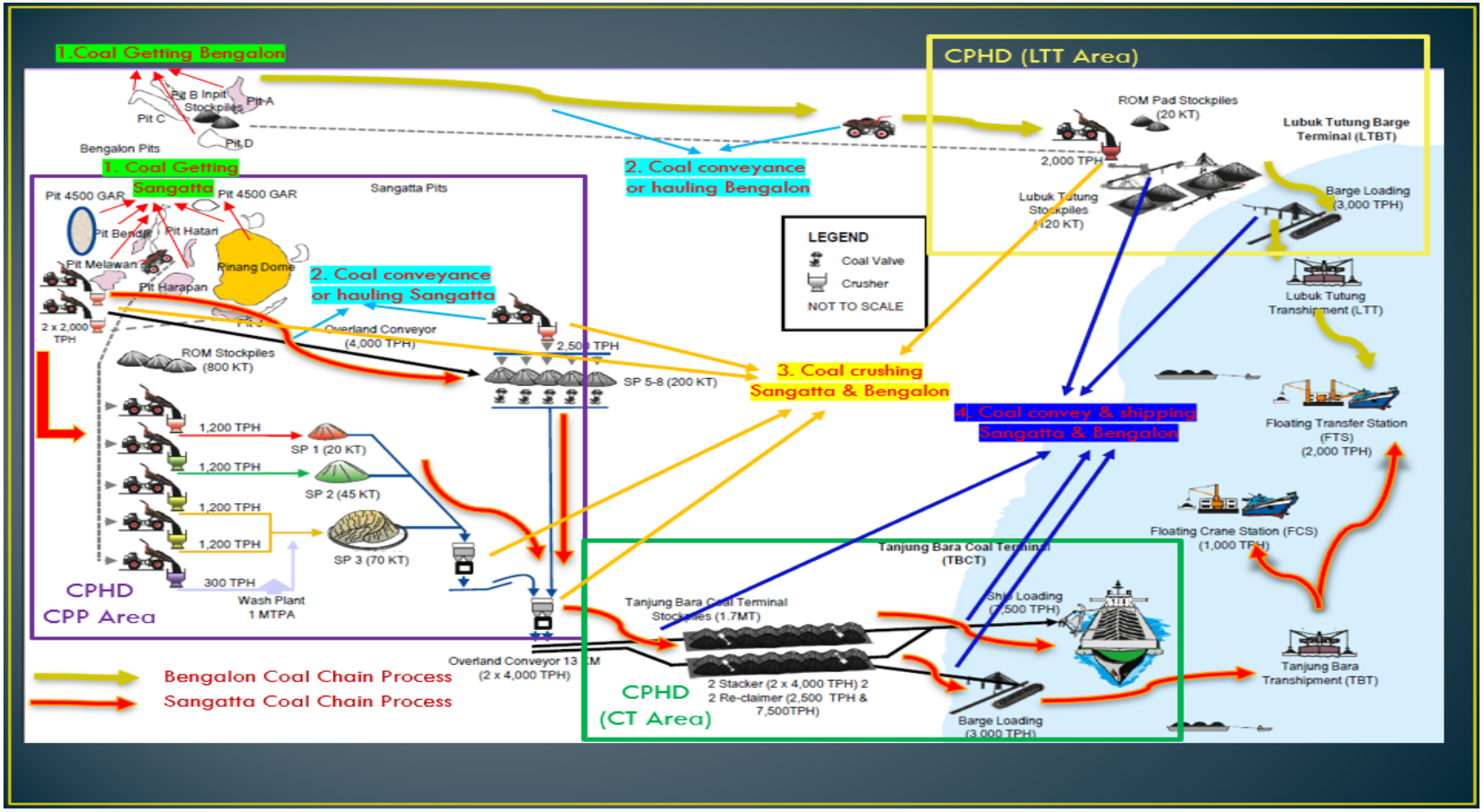


Figure 1. 6 Figure 1.6. PTKPC Coal Chain Processes

(Source: Internal data)

2. Coal Chain Capacity

The critical point in the CCP process is shipment loading activities, where it is processed by the coal terminal operation and supported by coal terminal maintenance, where the availability of all fixed plants for conveying coal from the CPP stockpile to the coal terminal or to the vessel is of utmost importance. Any issues that arise in the twin overland conveyor or during barge loading or ship loading activities can have a significant impact on shipping and sales. This underscores the crucial need for proper maintenance of all fixed plants within the coal terminal, given the tight alignment between shipment targets and plant capacity, which is 60 Mtpa as per Over Land Conveyor capacity, as detailed in Table 1.3 below.

Table 1. 3 PTKPC Coal Chain Capacities

(Source: Internal data)

Facilities	Sangatta	Bengalon	Total PTKPC
Crusher	8 units, capacity 58Mtpa	1 unit, capacity 12Mtpa	70Mtpa
Over Land Conveyor	3 units, capacity 60Mtpa	None	60Mtpa
Ship Loading	2 units, capacity 40Mtpa	None	40Mtpa
Barge Loading	1 unit, capacity 12Mtpa	1 unit, capacity 12Mtpa	24Mtpa
Transshipment	4 units, capacity 4Mtpa	8 units, capacity 8Mtpa	12Mtpa
Floating Crane	1 unit, capacity 7Mtpa	1 unit, capacity 9Mtpa	16Mtpa

Crushers

In Sangatta, there are eight crushers, comprising six within the Coal Processing Plants (CPP) and two located in the Melawan in-pit area, with a combined total capacity of 8,000 tons per hour (TPH). In Bengalon, there is a crusher at the Lubuk Tutung (LTT) Port with a capacity of 2,500 TPH.

CPP Stockpile

At the CPP features eight stockpiles, each with a capacity of 200,000 metric tons (Mt), resulting in a cumulative storage capacity of 1.6 Mt.

Conveyor

Within Sangatta, three Over Land Conveyors (OLC) are in operation, each with a capacity of 4,200 TPH. Two of these conveyors transport coal from CPP to the Coal Terminal (CT), while another OLC facilitates the transfer of coal from the Melawan in-pit area to the CPP.

Coal Terminal Stockpile

At the Coal Terminal (CT), there are three stockpiles (SP) with capacities of 600,000 Mt each, and at the Bengalon LTT Port, two stockpiles are present, with capacities of 40,000 Mt and 80,000 Mt, respectively.

Ship Loading Facilities

In Sangatta boasts two ship loaders, each with a capacity of 8,500 TPH. These loaders are capable of loading vessels ranging in size from 50,000 Mt to 200,000 Mt.

Barge Loading Facilities

Both Sangatta and Bengalon have their dedicated barge loading facilities, each with a capacity of 300 TPH. These facilities can efficiently load barges ranging in size from 4,000 Mt to 10,000 Mt.

Floating Cranes

The operation includes two floating cranes known as the Floating Transfer Station (FTS) and the Floating Crane System (FCS). The FTS boasts a loading rate capacity of up to 2,000 TPH, while the FCS can handle loading at rates of up to 1,000 TPH. These floating cranes are employed to unload coal from laden barges using cranes and grabs, subsequently loading the coal onto vessels. The use of FTS and FCS in transshipment is for blending coal between Bengalon products and Sangatta products; apart from that, it is also used for loading vessels with gear.

To support coal processing within PTKPC, covering a distance of 26 kilometres from the Melawan in-pit area to Port Tanjung Bara, a total of 33 plant exists in the CPP facilities, while 43 plants are located in the CT and LTT. These fixed plants are detailed in Table 1.4. These include the Overland Conveyor (OLC), Stacking and Stacker Conveyor, Reclaiming and Reclaimer Conveyor, Crusher, Ship loader conveyor, barge conveyor, and sampling conveyor. Ensuring the plant availability and conducting the operation and maintenance of these fixed plants falls under the responsibility of the Coal Processing Handling Department.

The 26-kilometer area is divided into four departments, each responsible for maintenance and operation. Two departments are located upstream from the Melawan in-pit area to the CPP Stockpile, namely the Coal Processing Plant Operation (CPPO) Department for fixed plant operation and the Coal Processing Plant Maintenance (CPPM) Department for maintenance. The remaining two departments are situated downstream, extending from the CPP Stockpile to the Port Tanjung Bara Coal Terminal, covering a scope area of 15 kilometres. These departments are the Coal Terminal Operation Department (CTOD) and Coal Terminal Maintenance Department (CTMD), including the Lubuk Tutung (LTT) Bengalon area, as depicted in Figure 1.6 and detailed in Figure 1.7 & 1.8. This research will focus on the CTMD to determine contract service maintenance strategies to support fixed plant maintenance activities and company shipping process.

Table 1. 4 Plant Lists in CPP and CT include LTT.

(Source: Internal data)

Plant in CPP	Plant in CT & LTT
CPP Stacking Conveyor #1	CT 2x Overland Conveyor
CPP Wash feed Conveyor	CT Spillage Conveyor
CPP Prima Stream Conveyor	CT Reclaiming Conveyor
CPP Boom Stacking Conveyor	CT Reclaimer Boom Conveyor
CPP Stacking Conveyor #2	CT Stacking Conveyor
CPP Product Reclaim Conveyor	CT Stacker Boom Conveyor
CPP Discharge Conveyor	CT Trestle Conveyor
CPP Dirty Line Conveyor #1	CT Sampling System TC1
CPP Dirty Line Conveyor #2	CT Sampling System BF1

Plant in CPP	Plant in CT & LTT
CPP Conveyor CV-01	CT Sampling System BF2
CPP Conveyor CV-02	CT North Transfer Conveyor
CPP Conveyor CV-03	CT South Transfer Conveyor
CPP Conveyor CV-04	CT North Ship loader Boom. Conv
CPP Feeding Conveyor CV-05	CT South Ship loader Boom. Conv
CPP Feeding Conveyor CV-06	CT Duplicate Overland Conveyor
CPP Feeding Conveyor CV-07	CT New Spillage Conveyor
CPP Feeding Conveyor CV-08	CT New Stacking Conveyor
CPP Conveyor CV-111	CT New Stacker Boom Conveyor
CPP Conveyor CV-113	CT New Reclaiming Conveyor
CPP Conveyor CV-112	CT New Reclaimer Boom Conveyor
CPP Conveyor CV-114	CT Stockpile Transfer Conveyor
CPP Belt Feeder CV-115	CT Marine Transfer Conveyor
CPP Melawan Western OLC CV-101	CT Marine belt feeder
CPP Spillage Conveyor	CT Marine transfer- Sampling (14.500)
CPP Conveyor CV-116	CT Marine transfer- Sampling SystemBF1
CPP 2500TPH Crusher 1	CT Marine transfer- Sampling SystemBF2
CPP 2500TPH Crusher 2	CT Barge transfer conveyor # 1
CPP 2500TPH Crusher 3	CT Barge transfer conveyor # 2
CPP 2500TPH Crusher 4	CT Barge Loader Conveyor (BLF)
CPP 2500TPH Crusher 5	CT BLF Sampling System
CPP 2500TPH Crusher 6	CT BLF Sampling System
CPP 2500TPH Crusher 7	LTT 2500TPH Crusher 1
CPP 2500TPH Crusher 8	LTT 2500TPH Crusher 2
	LTT_CONVEYOR CV-01
	LTT_MAGNETIC SEPARATOR CV-01
	LTT_CONVEYOR CV-01A
	LTT_TRANSFER CONVEYOR CV-02
	LTT_STACKER CONVEYOR ST-01
	LTT_STACKER CONVEYOR ST-02
	LTT_CONVEYOR CV-03
	LTT_CONVEYOR CV-04
	LTT_CONVEYOR CV-05
	LTT_SAMPLING STATION PLANT 2 CV-05

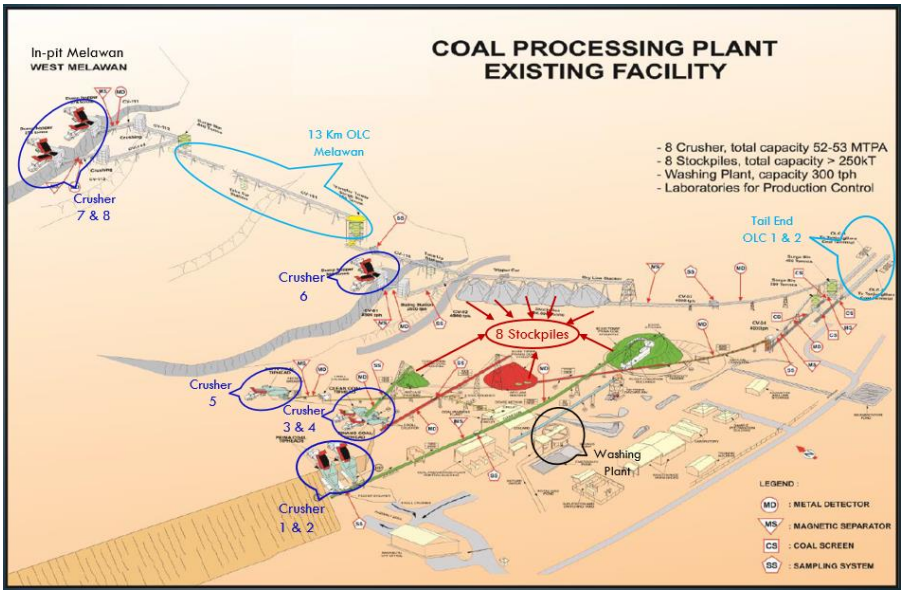


Figure 1. 7 Coal Processing Plant Facilities

(Source: Internal data)

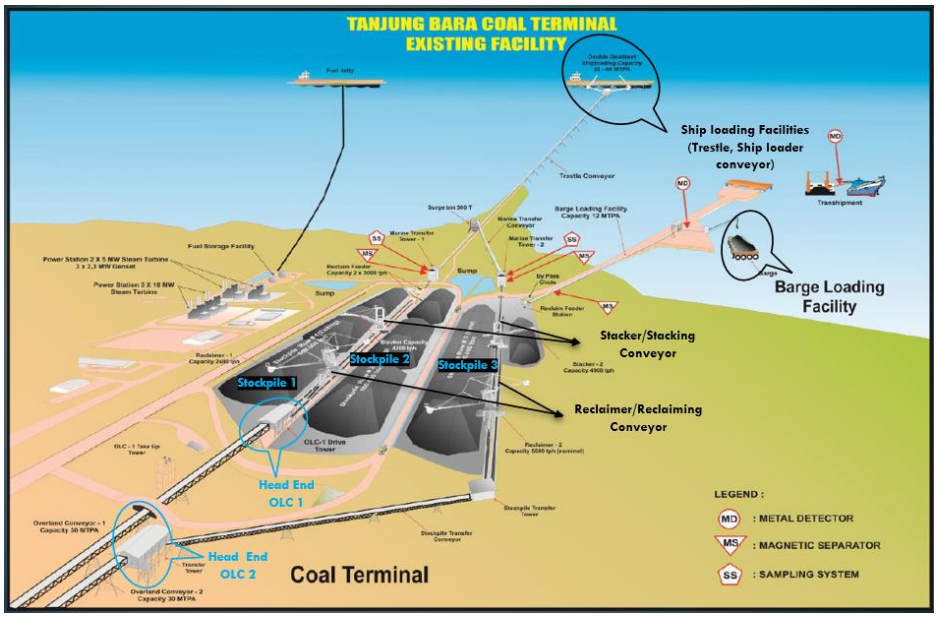


Figure 1. 8 Coal Terminal Facilities

(Source: Internal data)

Coal Terminal Maintenance Department (CTMD)

The Coal Terminal Maintenance department is one of the departments within CPHD that is responsible for maintaining all the plants at Coal Terminal (CT) and LTT. In the business process, the bottleneck position is located at CT,

where the success of achieving sales and shipments heavily depends on the ship loading facility and barge loading facility. Ensuring equipment availability must be consistently well-maintained to prevent any disruptions in shipping activities related to plant availability. Within the organizational structure of the CTMD, it is led by a manager and supported by four superintendents, including the Superintendent Maintenance Planning, Superintendent Electrical Maintenance, Superintendent Mechanical Maintenance, and Superintendent of LTT Port Facility, as depicted in Figure 1.9. The daily activities carried out by the CT involve preventive, corrective, predictive, proactive, and improvement maintenance to ensure that maintenance is conducted efficiently and effectively. Thus, unexpected plant breakdowns can be minimized.

Considering the numerous plants in CT and LTT as shown in Table 1.4, internal department coordination needs to be carefully maintained through long-term planning, mid-term planning, and short-term planning for maintenance to ensure that all work plans outlined in the budget are executed effectively. To support the CT in its duties and functions, it will receive assistance from Labor Supply (LS) and Contract Service (CS). The PTKPC resources within CTMD originate only from the Leading Hand level upwards, serving as supervisors for the tasks. Meanwhile, the main workforce responsible for tasks such as mechanics, fitters, welders, and helpers are sourced from LS and CS. LS will be integrated into the CT organizational structure, while CS will remain separate in the form of comprehensive work packages as per contract agreed, reporting, and being controlled to the custodial contract at the superintendent level. During execution, CT must also coordinate with CQC, the CCP coordinator, regarding the maintenance plan for all fixed plants to align it with the shipment schedule established by the Marketing division, in accordance with the budget approved by the COO, CFO, and CEO.

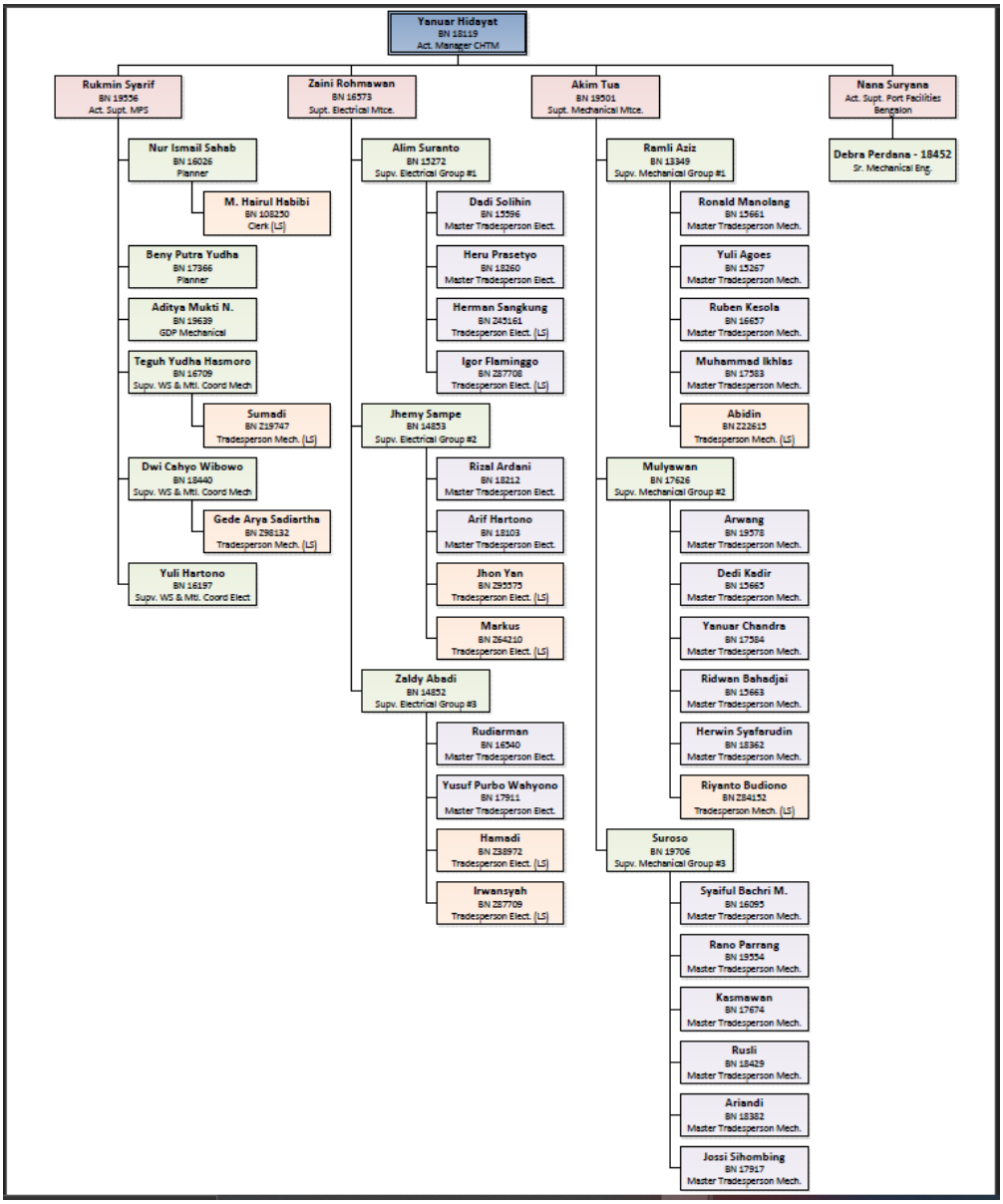


Figure 1. 9 Organizational structure of the CTMD

(Source: Internal data)

I.3 Business Issue

In the global context, every coal mining company operates as a price taker in the market. PTKPC is highly dependent on market prices. Generally, coal prices are influenced by four indexes: the average of the Indonesia Coal Index (ICI), the Newcastle Export Index (NEX), the Global Coal Newcastle Index (GCNC), and Platt's 5900. The global shift towards renewable energy sources poses challenges for coal mining companies, including declining coal demand

and potential financial risks associated with stranded assets. Companies like PTKPC may need to adapt their business models. In conclusion, the existence of PTKPC is highly contingent on global conditions, such as demand and selling prices. One recent example is the conflict between Russia and Ukraine in 2022, which led to high prices but reduced demand. On the other hand, in the local context, at the end of 2021, PTKPC faced a change in its permit, transitioning from the Coal Mining Business Work Agreement (Perjanjian Karya Pengusahaan Pertambangan Batubara or PKP2B) to the Special Mining Business License (Izin Usaha Pertambangan Khusus or IUPK).

Additionally, in 2022, PTKPC faced an export ban imposed by the Indonesian government, which had a negative impact on the company's income. This situation compelled the company to streamline its operations for sustainability. One of the strategies chosen by PTKPC was to simplify the number of contractors, and this approach was implemented in CTMD. Management conducted a review of the contract service scheme. Finally, at that time CTMD management decided to streamline the number of contractors to expect can get an efficient rate to undertake the scope of works related to perform conveyor maintenance. The detailed scope of work related to performing conveyor maintenance in the coal terminal and LTT maintenance can be seen in Table 1.5 below.

Table 1. 5 Scope of Work Contract Service Maintenance of Conveyor in CT

(Source: Internal data)

Detail of Work	Scope Of Work Contract Service of Conveyor Maintenance in CT	Weight
Daily / Routine Inspection	The contractor shall conduct an inspection for all conveyor equipment and accessories on a daily or regular basis which is decided by the custodian. The contractor must employ an experienced person to carry out an inspection to find any sign or symptom of failure.	6,7%
Repair Conveyor Belt	The contractor must have the ability to repair the damaged belt in both the hot and cold bonding process as well as provide adequate tools and equipment to do this work.	6,7%
Roller and Frame Replacement	The contractor is responsible to inspect and mark the defective roller which will be replaced on shutdown day. The contractor must prepare the spare parts, tools, and equipment which is needed to perform these jobs before shutdown day.	6,7%

Detail of Work	Scope Of Work Contract Service of Conveyor Maintenance in CT	Weight
Repair conveyor roller and frame	The contractor is responsible to refurbish the repairable roller and frame both onsite and at the workshop as well as prepare adequate tools and equipment to do this work.	6,7%
Repair transfer chute	The contractor is responsible to repair the conveyor transfer chute for Any leakage which is caused by a worn-out liner plate or ceramic or Any leakage which is caused by a defect on the backing plate.	6,7%
Belt Splicing	The contractor is responsible to conduct belt splicing work every time the custodian request.	6,7%
Provide splicing kit	The contractor is responsible to provide belt splicing kit material both fabric and steel cord whenever needed by the custodian.	6,7%
Repair pulley lagging	The contractor is responsible to provide equipment and tools for repair or replace pulley lagging both in situ and at the workshop location with the cold bonding method.	6,7%
Belt cleaner maintenance	The contractor is responsible to provide manpower, equipment, and tools for maintenance activities of belt cleaning devices.	6,7%
Conveyor skirt maintenance	The contractor is responsible to conduct an inspection of all conveyors skirting at the loading point chute, adjust and replace the skirt rubber as necessary.	6,7%
Liner maintenance	The contractor shall have the ability to repair damaged liner on the transfer chute, skirt board, flaps, and surge bin.	6,7%
Provide Belt Vulcanizer	The contractor shall provide one (1) unit belt vulcanizer which can be used for belt splicing up to 1800 mm belt width. The contractor is responsible to guarantee the physical availability of this equipment at 100%.	6,7%
Perform Fabrication	The contractor provides several qualified technicians to do the component replacement in any scheduled/unscheduled maintenance.	6,7%
Perform component overhaul	The contractor provides a qualified welder and fitter to rebuild or fabricate the structure at the workshop and or at the field during perform a shutdown.	6,7%
Perform component replacement	The contractor provides several qualified technicians to overhaul major components at the workshop.	6,7%

Additionally, since PTKPC operates in open pits, weather conditions are also of paramount importance when conducting both fixed plant maintenance and operations. Maintenance planning is expected to be more flexible to align with the operational and shipment needs. Over the past two years, exceptionally high rainfall has led to PTKPC's sales falling below the target. Actual shipments were 94.4% in 2021 and 84.1% in 2022. This situation compelled CTMD to conduct opportunistic maintenance. Consequently, the availability and readiness of manpower in CTMD are the primary keys to achieving this maintenance flexibility.

Problem Identification

In conducting shipments and sales, PTKPC is highly reliant on the plant physical availability (PA) of fixed plant coal terminals. To meet the shipment target, a minimum plant availability of 94% is required due to the maximum

capacity of plant and the target is very tight which is 60Mtpa. Achieving the Plant PA target is the responsibility of CTMD. In executing their tasks, 67% of the workers are sourced from contract services, 8% from labour supply, and the remaining 26% are organic PTKPC employees, making a total of 156 coal terminal resources. Therefore, ensuring the qualifications and capabilities of contractors at the coal terminal is of utmost importance. When the loading facilities are unable to operate due to damage or breakdown, KPC faces a situation with no income at that time, while the expenses cannot be avoided, such as employee salaries, contractor charges, equipment rentals, and other costs.

The maintenance plan must be flexible to ensure uninterrupted ship loading activities. For instance, during high-price periods when cargo is available and vessels are on-site, all fixed plants are expected to be ready for operation. PTKPC should seize this opportunity to maximize income by ensuring no obstacles in loading activities and avoiding demurrage charges. Additionally, weather conditions significantly influence achieving the expected conditions mentioned above. During the rainy season, mining activities may be limited, providing an opportunity to carry out maintenance on fixed plants. Thus, the availability and readiness of manpower in CTMD must be well-maintained. Several gaps exist between the current situation and the expected results, starting with low contract compliance as shown in Figure 1.10, which influences the plant's physical availability at only 93%, below the target of 94% as shown in Figure 1.11, and an increase in maintenance costs since December 2021, as seen in Figure 1.12 and for the detail gaps could be seen in Table 1.6. Contract compliance is a comparison between the actual fulfilment carried out by the contractor and the agreement in the contract, which includes the provision of resources such as the number of belt splicers, mechanics, helpers, welders, fitters, safety officers, administration, and site managers. Then the provision of materials such as splicing kits, lifting gear, splicing and spotter machines, including toolboxes, and finally the provision of support equipment, which includes the provision of operational vehicles, employee mess, and

offices. All these items will be calculated for compliance every month, which is called contract compliance, and will affect the contractor's monthly pro forma invoice payment. Contract compliance will also become material for periodic assessments, called contract performance evaluations. Therefore, with the broad scope of the contract, the success of the CTMD in carrying out its responsibilities regarding fixed plant maintenance in the coal terminal area is very dependent on the performance of the contract because 67% of the resources come from the CS, and the impact on the increase in cost per tonne is to cover the discrepancy in contract compliance. CT will look for resources, materials, or support equipment that are needed suddenly, which will certainly result in the cost being more expensive due to urgent procurement, which should already be in the PTPB contract item.

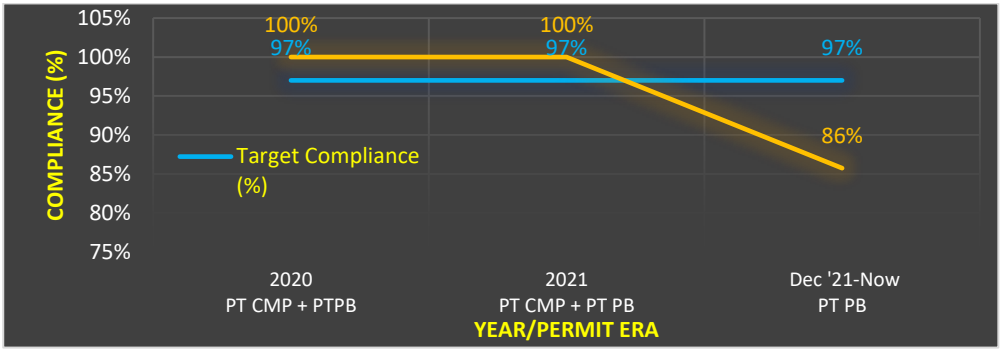


Figure 1. 10 The detailed gaps contract compliance Before Dec '21 vs After Dec '21

(Source: Internal data)

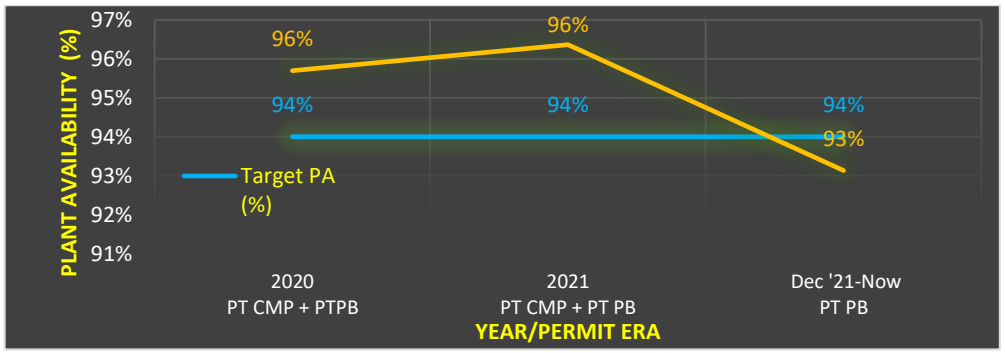


Figure 1. 11 The detailed gaps PA Before Dec '21 vs After Dec '21

(Source: Internal data)

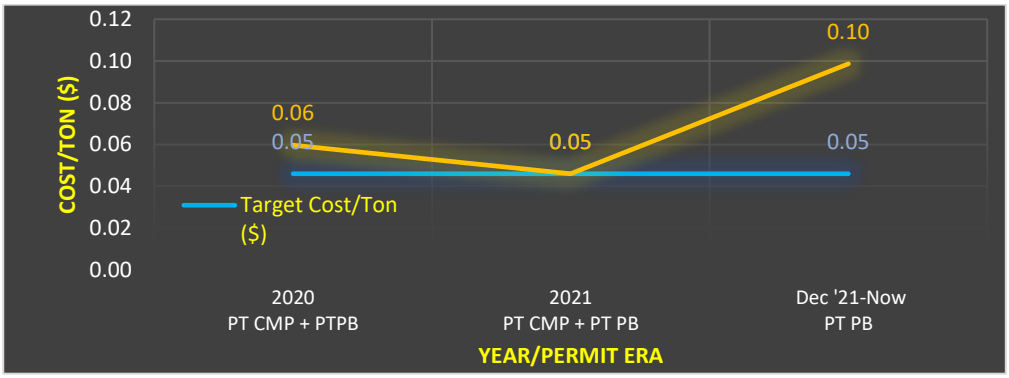


Figure 1. 12 The detailed gaps cost per ton Before Dec '21 vs After Dec '21

(Source: Internal data)

Table 1. 6 Gaps Before Dec '21 vs After Dec '21

(Source: Internal data)

Gaps Detail	Target	2020 PT CMP + PTPB	2021 PT CMP + PTPB	Dec '21-Now PTPB	Gap
Compliance	97%	100%	100%	86%	-11%
PA	94%	96%	96%	93%	-1%
Cost/Ton ($)	0.046	0.0597	0.046	0.105	0.059

Examining both graphs in Figure 1.13 and Figure 1.14, which illustrate Contract Compliance vs. PA After and Before December 2021, we can observe that since the new contract was initiated in December 2021, the average Contract Compliance until May 2023 has been only 86%, with Plant Physical Availability (PA) standing at 93%. Over the course of the 18-month duration of the current contract, there have been 7 months when PA Plant was below the 94% target that was established. Prior to December 2021, when two contractors were responsible for conveyor maintenance in CT, contract compliance consistently reached 100%, and PA Plants never dropped below 94%. This situation can be attributed to the fact that the workload was not solely reliant on a single contractor, making it easier for them to meet the specified target.

In addition, there has also been an increase in maintenance costs within CTMD, especially at the beginning of the execution, as measured by the cost per ton of coal shipped. Before changing the contract strategy, the average maintenance cost per tonnage was $0.046; however, after the change, it increased to $0.1. As explained above, this increase can be attributed to the higher amount of additional resource, material or support equipment required to compensate for the shortage caused by PTPB. The surge in costs was a result of the direct additional charge rate being higher than the rate agreed upon in the contract. These recurring incidents led to an accumulation of overall cost increases for CTMD. Detailed cost per ton before and after December 2021 can be found in Figure 1.13.

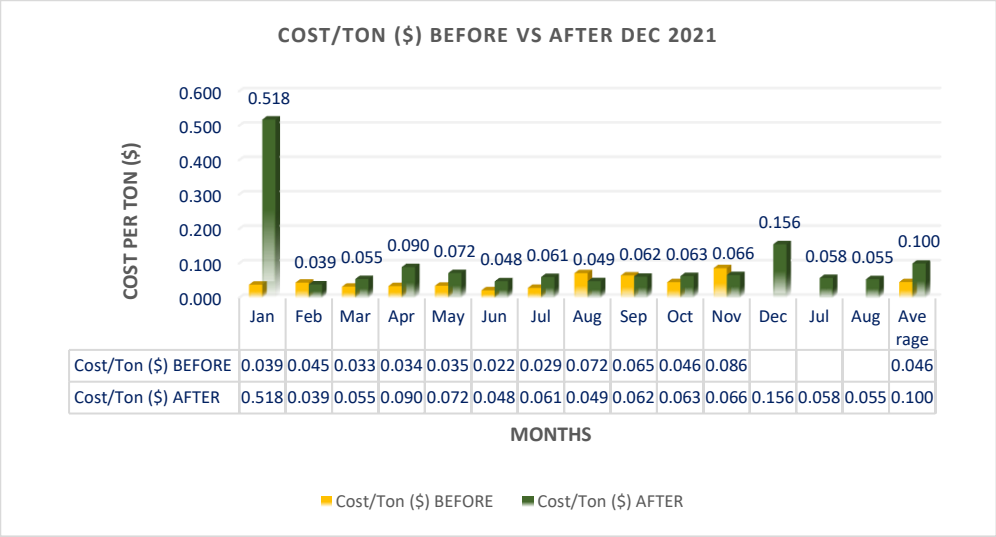


Figure 1. 13 Cost/ton ($) before vs after Dec 2021

(Source: Internal data)

We need to address and improve this situation by identifying the root causes and providing various scenarios to solve these gaps. The goal is to achieve a Plant Availability of 94%, increase contract compliance to nearly 100%, and reduce maintenance costs to the best practice level of $0.046 per ton. Furthermore, since the existing contract service is valid for three years until November 2024, we must prepare a preventive action plan to prevent similar non-compliance with contractors in the future. In March 2024, a new tender

will be processed as a preparation of current contract replacement. Based on the problem identification, and scenario 1 is the chosen approach in this research.

Stakeholders

1. Coal Terminal Maintenance is responsible for maintaining and ensuring the availability of fixed plants at the coal terminal based on the approved budget. To effectively carry out their tasks, CTMD engages contractors through the contract service scheme, which is typically valid for 3 years. The contractor assumes the role of the problem owner, providing services to the CTMD in accordance with the scope of the signed contract. The maintenance schedule is flexible, depending on weather conditions and cargo availability. Best practice dictates that fixed plant maintenance be conducted during the rainy season due to limited cargo availability or during window loading periods when there are no vessels to be loaded at CT.
2. Coal Terminal Operations oversee the operation of fixed plants in the CT and conduct ship-loading activities in accordance with CQC arrangements and vessel availability.
3. Coal Quality Control (CQC) manages the loading sequence and product selection for shipments based on vessel availability, information obtained from the Sales and Marketing division. After establishing the vessel schedule and cargo availability, Coal Quality can determine the window for fixed plant maintenance in CT. They maintain close communication with CTMD regarding the schedule due to its highly fluctuating nature.
4. Marketing department (MKT) arranges for vessels to be loaded at CT and handles invoicing for the buyer.
5. Contract department (CONT) is the division that handles the contract process at PTKPC. Generally, the contract division will focus on commercial to get the contract with the lowest price, while the technical aspects will be determined by the user. The tender process for a contract at PTKPC usually takes 8–10 months from pre-bid to award and all the stakeholder's role could be seen in the Tabel 1.7 below.

6. Finance department (FIN) is the department that manages PTKPC's finances and is responsible for carrying out PTKPC's payment obligations to related parties, including the payment of contractor invoices, after the finance department receives all supporting documents correctly and according to the terms of payment in the contract.
7. PTPB is a contractor that assists the CTMD in the maintenance of fixed plants at the Coal Terminal based on the Scope of Work in the contract.

Table 1. 7 Stakeholder's Roles

(Source: Internal data)

No.	Stakeholder Group	Roles
1	Coal Terminal Maintenance (CTMD)	• Providing a scope of work based on the contract requirements to support maintenance work. • Conducting a technical aspect requirement. • Controlling and monitoring contract execution. • Confirming invoices after the completion of work. • Conducting periodic evaluation.
2	Coal Terminal Operations (CTOD)	Operating fixed plants in the CT and conducting ship-loading activities.
3	Coal Quality Control (CQC)	Coordinates shipment loading, product selection, and establishes vessel schedules to arrange the plant maintenance schedule.
4	Marketing department (MKT)	Division that seeks buyers and arranges the arrival of Vessel including invoicing.
5	Contract department (CONT)	• Handling the contract process from the initial tender stage to the award process. • Conducting a commercial aspect assessment.
6	Finance department (FIN)	• Performing invoice document verification. • Making payment after complete approval.
7	PTPB	• Providing labour supply services to CTD. • Providing fabrication task services. • Supplying support equipment & splicing kit materials

Achievement of the shipment target depends on the availability of the fixed plant; therefore, plant readiness is of paramount importance. The capacity of the fixed plant closely corresponds to the shipment target as described before,

allowing no margin for error. The correlation of each mentioned stakeholder can be observed in the rich picture, Figure 1.14.

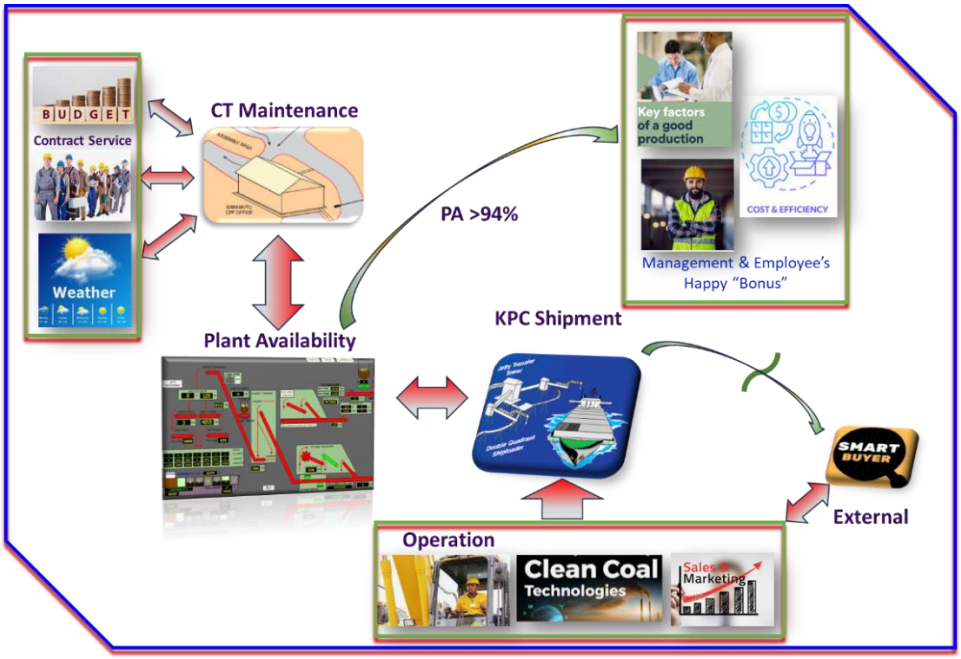


Figure 1. 14 Rich Picture

(Source: Internal data)

I.4 Research Questions and Research Objectives

To meet the shipment target, a minimum plant availability of 94% is required. Achieving the Plant PA target is the responsibility of CT maintenance, with up to 67% of the workforce sourced from contract services, 8% from labour supply, and the remaining 26% consisting of organic KPC employees. In order to effectively improve the performance of CS conveyor maintenance in a cost-effective manner at CT, it is imperative to address these gaps by answering the following questions:

1. What is the root cause of the contractor's inability to fulfil the contract's compliance requirements?
2. What are the relevant available scenarios to solve the current non-compliance contract performance problem?
3. What is the best alternative to face current condition?

Research Objectives

The objectives of this research are as follows:

1. To identify the root causes of the contractor's inability to fulfil obligations as per the agreed contract.
2. After identifying the root causes, to provide relevant alternative scenarios for resolving the existing issue.
3. And, to determine the best alternative in facing current condition to ensure there is no disruption to the maintenance of the fixed plant at the coal terminal.

I.5 Research Scope and Limitation

This research encompasses various scopes and limitations:

Scopes:

1. To ascertain the root cause the PTPB, functioning as the sole contractor responsible for conveyor maintenance in the CTMD, being unable to achieve contract compliance near 100% since December 2021.
2. The primary focus of this research is to explore the best alternative scenario for resolving the current issue wherein PTPB, the sole contractor for conveyor maintenance in the CTMD, cannot meet the contractual requirement 100% in supporting CT in achieving minimum overall plant PA to 94%.
3. Determination of alternative design routes through the utilization of Semi-Structured Interview Questions derived from the Research Questions and Focused Group Discussions (FGD) thank Then, it is evaluated using the Value-Focused Thinking (VFT) methodology.
4. Selection of the best alternative by employing the Analytic Hierarchy Process (AHP) method.

Limitations:

1. Data collection is limited up to August 2023.
2. The specific planning and scheduling details regarding the implementation of the chosen design route are beyond the scope of this research.

3. The data sources primarily focus on PTPB's monthly proforma invoices, contract scope, and CTMD's monthly reports.
4. Data collection for this research was conducted from January 2021 to August 2023.
5. The implementation plan is formulated from the perspective of the Contract division and the custodian.

Chapter II Literature Review

The literature review in this thesis is really important. It helps us understand what other people have researched before in the same area. We will learn about theories, ongoing research, and what we already know from this review. This will help us make a good argument in our study. Also, by looking at past studies, we can see what methods and phrases they used. This will help us choose the right methods for our study. We will look at how others did their research in this field and what worked well or did not work.

In our study, we will use specific methods like the Kepner-Tregoe Problem Analysis, Cynefin Framework, Stakeholder Analysis, Problem Tree / Tree Diagram, and the Analytical Hierarchy Process. The literature review will help us decide if these methods are right for our research goals and questions. So, by understanding what others have studied, we hope to fill in the gaps in what we know and get a better understanding of our research topic.

II.1 Theoretical Foundation

Kepner-Tregoe Problem Analysis

Every problem can be identified by using Kepner-Tregoe Decision Analysis, as developed by Kepner-Tregoe, Inc (1979). This methodology is designed to help individuals and organizations make informed decisions in complex situations by systematically analysing problems, identifying potential solutions, and assessing the best course of action. Kepner-Tregoe Decision Analysis is widely used in various industries, including business, engineering, healthcare, and project management. KT Problem Analysis will help us to identify the existing problem by answering these following questions:

- What is the problem and what is not the problem?
- Where did the problem occur? Where is everything OK?
- When did the problem first occur? When was everything OK?
- What is the magnitude of the problem?

Through this methodology, the CTMD problem can be analysed, as shown in Figure 2.1.

	IS	IS NOT	DISTINCTION	POSSIBLE CAUSE
What	• Contract Compliance below the target • Below PA Plant • High-cost maintenance	Budget Contract Availability	Average PA 93% and Average Contract Compliance 86%	Inadequate contractor, Excessive scope of the contract
When	Since the new contract began on December 2021	Before December 2021	There was a contractor replacement on Dec 2021	Unreadiness of the new contractor, Contractor adaptation period
Where	Coal Terminal (CT) Maintenance	Coal Processing (CP) Maintenance	There has been no contractor replacement at CP Maintenance since December 2021. There has been a contractor replacement at CT Maintenance since December 2021.	CP Still using the same contractor with a revised scope of work. Contractor replacement in CT responding efficiently regarding the change in the KPC contract from PKP2B to IUPK
Extend	Increasement maintenance cost/ton. The average employee attendance has been only 82% since the contract started.	Cost code contract absorption	Disproportionate spending, Inappropriate spending allocation. Contractor financial problem	Cover up a lack of compliance by adding additional resources, The additional resource rate is higher than the contract rate. The new contractor could not pay qualified employees.

Figure 2. 1 KT Problem Analysis

(Source: Kepner-Tregoe, Inc (1979))

Cynefin Framework

Every The Cynefin Framework is a model that helps people and organizations understand complex systems and make decisions when things are uncertain and unclear. It was created by Dave Snowden and Mary Boone in the late 1990s and has been used in various fields like management, leadership, and innovation.

The Cynefin Framework has four parts: Simple, Complicated, Complex, and Chaotic. Each part represents a different kind of system, and they all have different levels of predictability and causality. This framework helps people and organizations figure out which part they are dealing with and what kind of approach to use:

1. **The Simple** part has clear cause-and-effect relationships, and outcomes are easy to predict. Here, using best practices and standard procedures works well to get the results you want.
2. **The Complicated** part has multiple cause-and-effect relationships, and it takes expert knowledge and analysis to understand and solve problems. In this part, using good practices and expert opinions is effective.
3. **The Complex** part has non-linear cause-and-effect relationships, and outcomes are unpredictable. Here, it's best to use experimentation, adaptability, and let solutions emerge to deal with uncertainty and complexity.
4. **The Chaotic** part is completely unpredictable and requires immediate action to stabilize the situation. In this part, trying new and innovative approaches quickly is the way to handle crises.

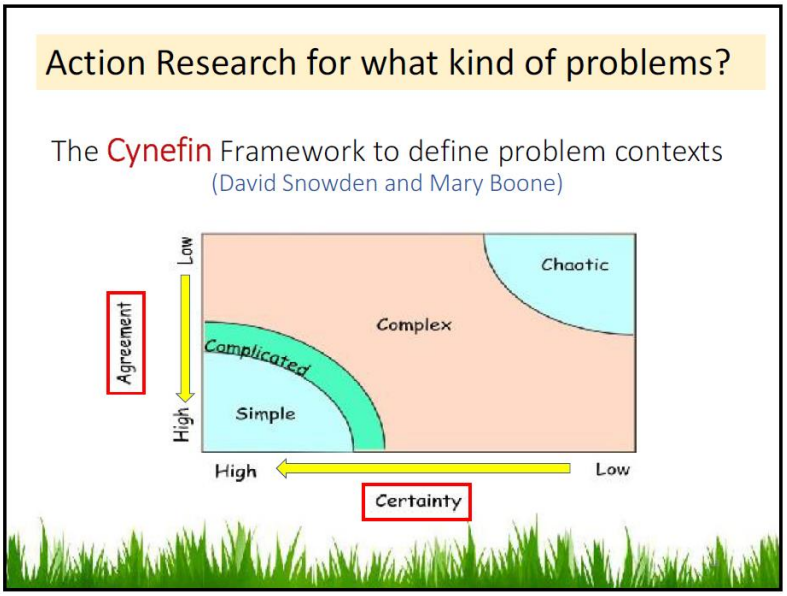


Figure 2. 2 The Cynefin Framework

(Source: Snowden, D & Boone, M. 2007)

Problem Tree / Tree Diagram

After identifying a problem, the next step is to determine the causes of the problem. This can be done using a Problem Tree. According to Silverman

(1994), a Tree Diagram, which is also called a systematic or tree diagram, is designed to organize cause-and-effect relationships and create a more structured understanding of the components related to the prioritized problem. The steps in creating a Problem Tree can be explained as follows:

1. The first step in building a problem tree is to identify and define the main problem of the organization based on the analysis of available information. There are various ways to formulate the main problem, such as through discussions, brainstorming, and gap analysis.
2. Analyse the consequences or effects of the identified main problem as stated on from step 1.
3. Analyse the causes of the main problem. At this stage, we call these causes the primary causes.
4. The fourth step is to further analyse the causes of the primary causes. We call the causes of the primary causes the secondary causes.
5. The fifth step is to further analyse the causes of the secondary causes. This analysis can continue until we identify the root cause.
6. Create the entire problem tree, incorporating all the identified causes and effects.

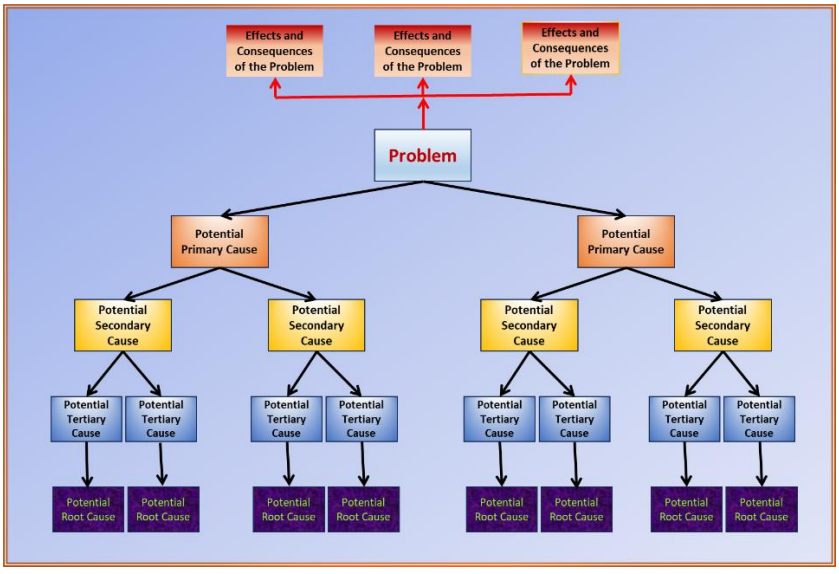


Figure 2. 3 Problem Tree / Tree Diagram

(Source: Created by Author)

Focus Group Discussion (FGD)

Morgan (1988) provides valuable guidance on conducting focus groups, a technique used to explore specific issues and favoured by researchers. Ideal group size ranges from eight to twelve participants, with a focus on ensuring active involvement and preventing one person from dominating discussions. The researcher acts as a facilitator, guiding discussions, maintaining focus, and ensuring everyone participates. Facilitation skills are crucial, and typically two researchers are needed: one to facilitate and ask questions, and another to document responses. Recording discussions, preferably through video, is recommended. Planning is essential, including contacting participants and preparing questions, often providing materials beforehand.

Additionally, Morgan (1988) suggests that each session should last at least two hours, with a maximum of three hours. Organizing and documenting findings takes time, and it's essential to document each group interview before moving on to the next one. Several potential issues must be addressed, such as participant reluctance, which can be overcome by providing materials and systematically soliciting individual views. Another challenge is the domination of discussion by a few individuals. Facilitators should politely encourage balanced participation. "Groupthink" can also occur, but group interviews allow for diverse viewpoints. This method efficiently gathers information and suits the typical dissertation timeline of three to four months. The next step in conducting an FGD involves:

1. Define FGD Purpose: Clarify the specific knowledge or insights we seek.
2. Formulate Research Questions: Create research or evaluation questions related to the FGD's purpose.
3. Develop Protocols: Prepare protocols, including the moderator's guide and focus group guide, specifying roles, conduct, and question sequences.
4. Determine Participants: Use various methods like nomination or open calls to select participants, considering group composition.

5. Conduct the FGD: Employ effective moderation techniques and ensure thorough recording of the session.
6. Debrief: Immediately after the FGD, gather insights from the moderator, observers, evaluators, and researchers, capturing additional information.
7. Analyse Data: Analyse qualitative data from the FGD to identify emerging themes and trends, possibly using software.
8. Present Findings: Communicate findings in a suitable format, such as oral presentations, written reports, videos, or a combination.

Stakeholder Analysis

Stakeholder analysis involves identifying relevant stakeholders and assessing their interests, strengths, and relationships concerning a specific project or organization. It requires understanding stakeholder viewpoints and expectations to effectively manage relationships and make informed decisions. In essence, it's a method for recognizing, examining, and comprehending the parties involved in a project, organization, or business initiative. Its primary goal is to acknowledge and comprehend stakeholders' interests, strengths, weaknesses, and their relative positions. The theoretical foundation of stakeholder analysis encompasses several key concepts, as outlined by Freeman, R. Edward in 1984:

- **Stakeholders**: These are individuals, groups, or organizations with interests that may be affected by decisions, actions, or outcomes of a project or organization. Stakeholders can include owners, employees, consumers, suppliers, governments, local communities, non-governmental organizations (NGOs), and more. Identifying the right stakeholders is the initial step in stakeholder analysis.
- **Interests**: Interests are the things that matter to stakeholders and can impact or be impacted by a project or organization. Interests might involve financial gain, reputation, environmental sustainability, public well-being, security, and so on. Recognizing and comprehending the diverse interests of each stakeholder influences how you engage with them.

- **Power**: Power signifies the ability or influence that stakeholders possess in shaping decisions or actions. Strengths can derive from factors like asset ownership, specialized knowledge, political support, resource access, or heavy reliance on an organization. Understanding stakeholder strengths aids in determining effective communication and engagement strategies.
- **Dependency**: Dependency reflects the level of reliance of an organization on a particular stakeholder or vice versa. Dependency can arise from factors such as resources provided by stakeholders, close business relationships, or the influence a stakeholder wields over an organization's success. Understanding these dependencies assists in managing relationships with critical stakeholders.
- Analysis and Approach: Various approaches are employed in stakeholder analysis, including:
    - Communication Channel Analysis: Examining the communication channels used by stakeholders to gather information and engage with organizations, facilitating effective communication strategies.
    - Power-Interest Matrix: Assessing stakeholder strengths and interests to determine appropriate strategies, like prioritizing key stakeholders or addressing potential conflicts.
    - Interest-Based and Impact-Based Approach: Analysing stakeholder interests and influence to identify priority groups in decision-making or resource allocation.
    - Interest-Power Analysis: Combining interest and strength factors to categorize stakeholders and formulate suitable strategies.
    - Social Network Analysis: Studying relationships and interactions among stakeholders to understand social and political dynamics that might impact an organization or project.

Value-Focused Thinking (VFT)

Value-Focused Thinking (VFT) is an analytical technique that concentrates on expected or desired values to help with difficult decision making (Ralph L. Keeney, 1992). Using value-focused thinking can help you allocate valuable cognitive energy towards making better judgements. Better decisions are the result of particular processes that view decisions through the prism of "focusing on values," as well as the insights that come from contemplation. This change in perspective can greatly enhance our ability to make decisions since values not only help us generate better options but also help us recognise better decision-making circumstances. Better decisions are something you decide on for yourself in this situation, therefore you should view it as a chance to make a decision rather than a challenge.

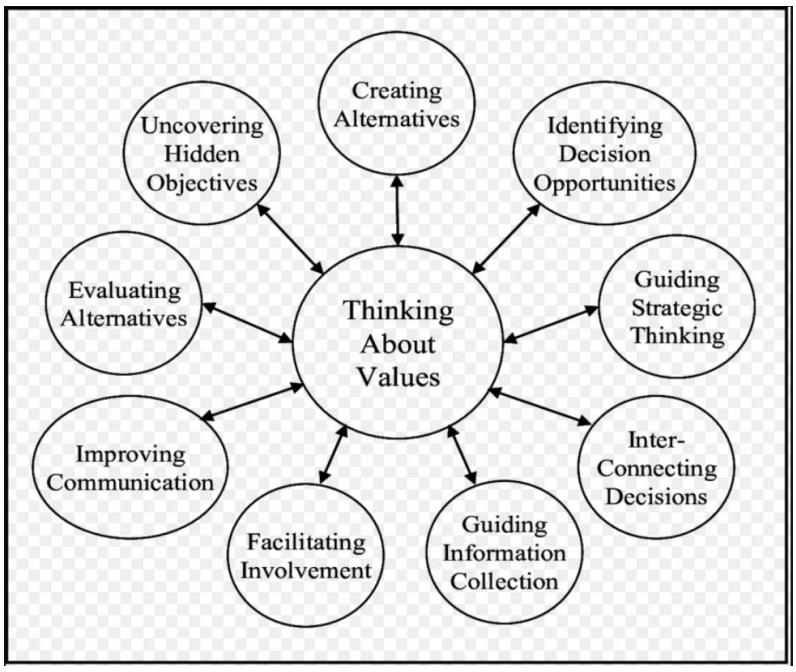


Figure 2. 4 Central Role of Thinking About

(Source: Ralph L. Keeney, 1992)

A critical first step in developing a value model that centres on the demands of stakeholders is to identify them and gain a thorough understanding of them, according to value-focused thinking (VFT). By include stakeholders in the decision-making process, it is possible to guarantee that the values

they hold dear are given top priority and are reflected in the decisions made. Value-Focused Thinking emphasises the significance of engaging stakeholders to understand their values and embrace varied perspectives (Ralph L. Keeney, 1992).

Value-focused thinking involves several steps to help you make decisions:

1. Identify Stakeholders and Values: Recognize the people involved in the decision-making process and understand their important values.
2. Develop a Hierarchy of Values: Create a priority list that shows the importance and relationships among the identified values.
3. Create a Value Model: Construct a visual representation, like a diagram or hierarchy, to showcase how values and sub-values relate to each other.
4. Generate Alternatives: Come up with different options to achieve the desired values, considering the values outlined in the model.
5. Assess Consequences: Evaluate the positive and negative outcomes of each alternative in relation to the desired values.
6. Conduct Sensitivity Analysis: Test how alternatives hold up under changes in key factors to understand their stability and sensitivity.
7. Make a Decision: Based on the assessments and analyses, make decisions that align with desired values and contribute to long-term goals.

Analytic Hierarchy Process (AHP)

The Analytical Hierarchy Process (AHP) is a method used for making decisions in complex, unstructured, and multi-attribute problems. It involves ranking different decision alternatives and selecting the best ones based on numerical criteria. AHP was developed by Thomas L. Saaty, a mathematician from the University of Pittsburgh, in the 1970s. This decision support model breaks down intricate multi-factor or multi-criteria problems

into a hierarchy. AHP is widely applied in decision-making for various criteria, such as planning, resource allocation, and prioritizing strategies in conflict situations. With AHP, a complicated problem can be broken down into groups and organized hierarchically, making it appear more structured and systematic.

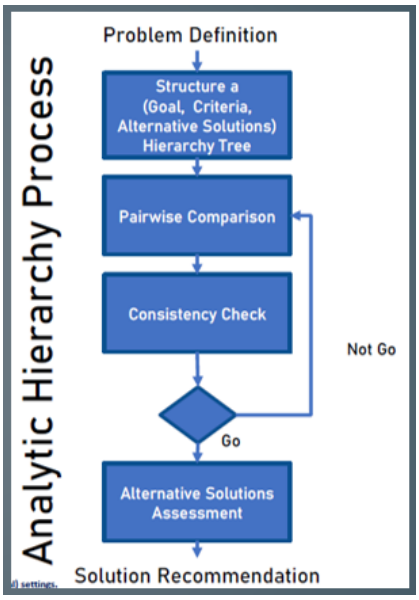


Figure 2. 5 Analytic Hierarchy Process

(Source: Meditya Wasesa, Ph.D., 2023)

The main concept of AHP is to create a hierarchy of decision criteria and specify the different options available. The AHP algorithm primarily consists of two stages: establishing the relative importance of decision criteria and establishing the relative rankings or priorities of alternatives. We can compare both qualitative and quantitative information by using informed judgments to calculate weights and priorities. The Analytic Hierarchy Process comprises several steps:

1. Create a hierarchy (Objectives, Criteria, Alternatives - OCA). The initial phase of AHP involves constructing a visual representation of the problem, including the ultimate objective, the criteria, and the available choices.

2. Perform pairwise comparisons to assess the relative significance of each combination of decision alternatives and criteria. AHP employs a scale from 1 to 9 for the prioritization procedure.
3. Conduct a Consistency Check.
4. Alternative Solution Assessment

II.2 Marginal Theoretical Contribution

The table displaying the marginal theoretical contributions serves as an overview of previous research endeavours related to decision-making processes, which have utilized tools like Focus Group Discussions, the Hazard Identification, Risk Assessment and Determining Control (HIRADC) Matrix Scorecard, and AHP. This table not only aids in assessing the research's contributions to the advancement, consolidation, and incorporation of existing theories but also highlights the additional value brought by this research within the context of prior studies. It illustrates how this research adopts a comprehensive approach to addressing complex problems, contributing to the integration of various theoretical concepts, as depicted in Figure 2.7. Table 2.3 specifies the position of this study, which is anticipated to be a valuable contribution to future research developments.

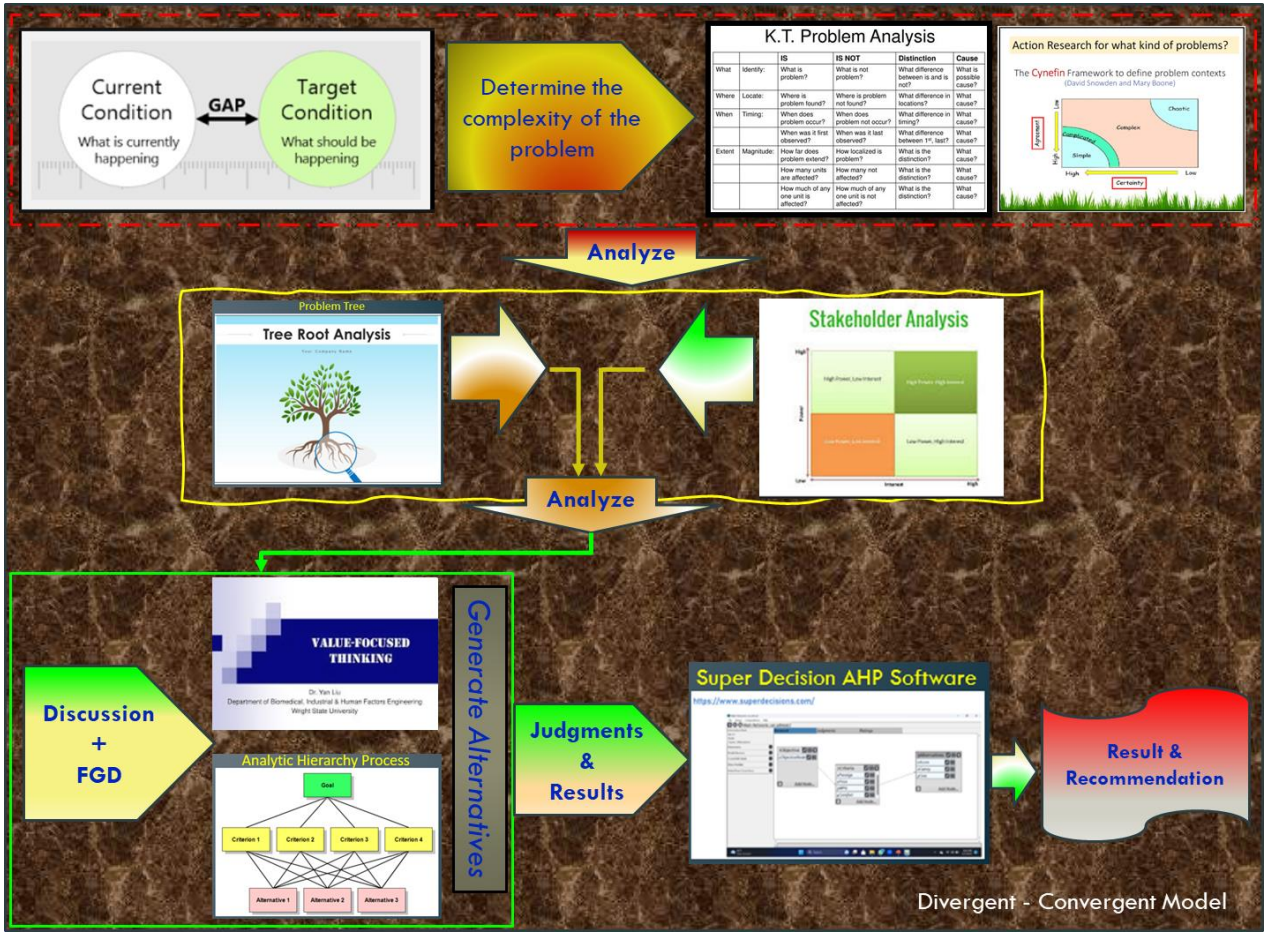


Figure 2. 6 Multimethodological integration concepts

(Source: Author)

Table 2. 1 The position of this study based on the previous journals.

(Source: Author)

Author of Journal	Year of Journal	Method(s)	Study Objectives	Decision making impact	Data Collection	Criteria of Decision making	Software usage	The context of the object of study	Location & Level of studied object	Finding
E G Sonjaya et al.	2018	Fuzzy Analytical Hierarchy Process (FAHP)	Provide objective assistance to the management or appraisal team in choosing the best PLN Rayon based on the company's standards.	Company	Literature Review; Interview	Economic Technology Internal	No	Objectives-based selection of the optimal PLN Rayon unit	Indonesia, East Cirebon (City level)	By recalculating the significant intensity of six criteria to determine which Rayon is best, fuzzy AHP can suggest an objective selection. From the customers' standpoint, the Kuningan Rayon, which received the highest final result score of 98,948, is the best Rayon selection in the PT PLN (Persero) Cirebon area.
Alicja Lenarczy et al.	2022	Analytic Hierarchy Process (AHP); Multi Criteria Decision Making (MCDM); Numerical Taxonomy (NT)	Determine which renewable energy source (RES) technology is most suitable for Poland's current socioeconomic situation in order to produce electricity.	Country	Literature Review; Interview	Politic, Economic. Social, Technology, Environment, Legal, Internal	No	Sources of renewable energy within the framework of energy policy	Poland (Country level)	The findings indicate that in Poland, offshore wind farms offer the most potential for advancement as a renewable energy source. The following three technologies were ranked similarly: biomass power plants, biogas plants, and distributed photovoltaic energy, in that order. Geothermal and hydropower were the lowest ranked technologies.
Chaobo Zhang et al	2021	Fuzzy Analytical Hierarchy Process (FAHP)	Analytic hierarchy process-based fuzzy post mining method for operation anomaly detection of building energy systems	Country	Literature Review; Interview, FGD	Environment, Economic, Social	Yes	evaluate the value of the mined association rules for improving the energy efficiency	China	The majority of association rule mining's usefulness for energy efficiency is limited to its ability to extract operational patterns from building data. This paper suggests a fuzzy post-mining technique based on AHP for automatically removing useless rules. The value of each rule for improving energy efficiency is evaluated using three main criteria and six supporting criteria. By addressing imprecise judgments, fuzzy set theory strengthens the robustness of rule assessment. Weights for criteria and sub-criteria are determined by AHP, which provides a thorough evaluation of rule value. The approach is tested on 117,636 rules extracted from the operational data of a chiller plant, and it extracts more valuable rules (93.51% vs. 17.28%) than conventional methods.

Author of Journal	Year of Journal	Method(s)	Study Objectives	Decision making impact	Data Collection	Criteria of Decision making	Software usage	The context of the object of study	Location & Level of studied object	Finding
Alhindi et al	2020	Analytic Hierarchy Process (AHP)	Choosing the longwall mining system maintenance strategy that will best balance various competing needs, including cost, reliability, safety, and production efficiency.	Company	Literature Review; Interview	Economic, Environment, Internal	Yes	Focuses on longwall mining systems, a widely used underground mining method for extracting coal or other minerals	India	Present the most appropriate maintenance strategy for the studied longwall mining systems based on the AHP analysis and associated findings.
Shafini Mohd Shafie et al.	2022	Analytic Hierarchy Process (AHP)	The purpose of this study is to model the ideal layout for Malaysia's fuel cell-based electricity generation system.	Country	Literature Review; Interview	Politic, Technology, Environment, Internal	No	The location of the fuel cell-based electricity generation design	Malaysia (Country level)	When taking into account the economic and environmental concerns, Sarawak State is the most ideal location.
Panagiotis K et al	2020	Fuzzy Analytical Hierarchy Process (FAHP)	Determine which possible risks in a sour crude oil processing plant to prioritize.	Company	Literature Review; Interview, FDG	Technology, Environment, Internal	Yes	Development and application of the expanded FAHP-HAZOP-DRMA approach (XPA-HAZOP) in this industry	Greece	A Fuzzy-Analytical Hierarchy-Process (FAHP) and Decision Risk Matrix (DRMA) were used in an extended Hazard and Operability (HAZOP) study to identify and rank possible hazards in a sour crude oil processing plant in Eastern Macedonia, Greece. As a tool for decision-makers to allocate funds for preventing specific deviations, the chemical industry developed and implemented the integrated FAHP-HAZOP-DRMA (or XPA-HAZOP) process for hazard assessment.
Santosh Mishra et al	2015	Analytic Hierarchy Process (AHP)	Utilizing a decision-making tool to choose a machine's best maintenance plan (AHP).	Company	Literature Review; Interview, Questionnaire	Economic, Technology Environment, Internal	No	The way an average Using tools for decision-making can simplify the maintenance strategy selection problem.	India	Managing variables that affect the achievement of organizational goals is made easier by utilizing the advantages and capabilities of MCDM approaches. The general maintenance strategy selection problem can benefit from these steps, and by changing the criteria weight, sensitivity analysis using the Analytic Hierarchy Process (AHP) can be used to measure the influence on the output.

Author of Journal	Year of Journal	Method(s)	Study Objectives	Decision making impact	Data Collection	Criteria of Decision making	Software usage	The context of the object of study	Location & Level of studied object	Finding
Mousumi Modak et al	2017	Balanced Scorecard (BSC) and the Fuzzy Analytic Hierarchy Process (FAHP)	To create a framework for evaluating performance in the Indian coal mining industry using BSC and FAHP. Additionally, the study will assess if outsourcing an organization's operations is appropriate given its performance status.	Country	Literature Review; Interview, Questionnaire FGD	Politic, Economic. Social, Technology, Environment, Legal, Internal	No	Assessing the impact of outsourcing on organizational performance, aiming to reduce dependence on imported coal, ensure affordability for domestic customers, and improve operational efficiency.	India	The integration of BSC and FAHP provides a holistic approach to assess the impact of outsourcing decisions on organizational performance for the Indian coal mining industry.

Table 2. 2 The position of this study based on the previous thesis.

(Source: Author)

Title & Year	Authors	Research Questions	Problem		Methods (data collection, data analysis, decision methods)	Contributions (theory, modification of methods or conceptual framework, etc.)	Solution
			Current situation	**Ideal situation**			
WEIGHTED MULTI CRITERIA OF CONSULTANT AND CONTRACTOR SELECTION AT PT. JICT 2017	LULITA INDRA DEWI (NIM 29109156)	**1**. What are the best criteria and attributes to be used in selecting consultants and contractors? **2**. How can one find the best score or weight for each criterion?	Some CAPEX projects in the period 2009–2011 had a delay; even some projects could have been finished on time or earlier, but there were issues such as a lack of labor quantity and skill, including low-quality materials.	All the CAPEX projects in 2009–2011 must be finished on time without any issues related to the quality of materials and resources.	The criteria technical gathered from a questionnaire, Quantitative approach, (**Creswell, 2003)** Survey, Trend analysis, Correlation Research, Exploratory Research, Descriptive Research & Experimental Research, Linkert (**Scale Aaker, 2007)**	Qualification method to determine the competency and ability of the contractor **Moore, 1985**. Four factors influence the selection type of consultants **Ling, et al 2003**: **1**. Task performance (**Hunter, 1983**) **2**. Contextual performance (**Borman & Motowidlo, 1993**) **3**. Professional fee by Consultant (**Coase, 1937**) **4**. Network, Firm's tendency to rely on reputation (**Granovetter, 1985**).	Improvement of tender assessment, especially the weighted multi criteria on selecting Consultant and Contractor
DESIGN OF PERFORMANCE INDICATORS FOR CONTRACTOR MANAGEMENT BASED ON THE IPMS FRAMEWORK: A CASE STUDY IN THE MAINTENANCE DEPARTMENT OF THE CONCENTRATING DIVISION AT PT. FREEPORT INDONESIA IN 2009	WISNU HARTOMO (NIM: 29107135)	**1**. How to evaluate the contract's implementation by the contractor in the Concentrating Division Maintenance? **2**. How to identify the advantages of using contractors and the impact on the company of achieving effective and efficient performance?	There is no performance measurement system in the maintenance department for evaluating the effectiveness of available contractor usage. There had never been a periodic performance appraisal of contractors conducted in the maintenance department to get feedback for	Availability of a contractor performance measurement system in the maintenance department that can evaluate the effectiveness of contractor management. Conduct periodic evaluations of contractor performance to ensure the credibility of contractors and get feedback for continuous improvement in the	Integrated Performance Measurement System (**Darmawan Wibisono, 2006**) Collecting primary and secondary data by taking it from the department's financial performance report. History service request department from 2006–2008.	Outsourcing is not only limited to carrying out activities but also involves human resources, facilities, equipment, technology, and assets. (**Chase et al. 2006, p. 413**). Outsourcing must be based on comprehensive calculations to get the expected output. (**Meredith et al. 2002, p. 27–29**). Outsourcing must be managed properly and correctly so that it does not have a negative impact	Providing a contractor performance measurement system that can measure both as a team and individually and is integrated with the department's vision, mission, and strategy and in accordance with the needs and desires of stakeholders

Title & Year	Authors	Research Questions	Problem		Methods (data collection, data analysis, decision methods)	Contributions (theory, modification of methods or conceptual framework, etc.)	Solution
			Current situation	**Ideal situation**			
			continuous improvement.	maintenance department.	Interview and Focus group discussion	on the company's finances (**McIvor, 2005**).	
RISK MANAGEMENT OF OUTSOURCING FOR PRINCIPAL RAIL CONTRACTOR (PRC) COMMON INFRASTRUCTURE PHASE 4 (CIP 4) PROJECT 2011	TEGUH IMAN SUDJUDI (NIM: 29109117)	**1**. What is the probability of risks in each step of the outsourcing business process? **2**. What is the risk mapping and ranking by using the risk matrix according to risk-based identification (RBI) as applied by Rick Peterson?	There is no guidance to analyse and mitigate risk for the project. Common practice relies on engineers' feelings and experience in dealing with outsourcing risks. The vendor classification level has not yet been set up by the contract department. The last several projects had delays, poor product and service quality, and projects that were over budget.	Guidance to analyse and mitigate the project risk must be available and applied. The measurable vendor's classification must be set up by the contract department to ensure the quality of service and product meet the requirements within the budget project.	Outsourcing Life Cycle (**Sara Cullen MIS QUARTERLY EXECUTIVE VOL.4 No.1/ March 2005**) Selection criteria and weighted score. HIRADC matrix score card.	Drivers' companies tend to do outsourcing strategies (**De Rose & Mc Laughlin, 1995**): **1.** Adding expertise: Internal company has limited source. **2**. Cost reduction: external providers can be more effective. **3**. Internal capacity is constrained to respond to the demand. **4**. Comprehensive Service. **5**. Continuous improvement: external always updates the latest technology. **6**. Sharpen strategic focus: Focus internal resources on core business. Organizations and companies benefits of outsourcing implementation (**Harland, 2005**): Enable focus on core business, cost reduction, increased flexibility, and ability to configure resources and market needs.	Identify outsourcing risk by following the outsourcing business process. Analyse the current outsourcing condition in relation to the policy, process, and risk for system improvement. Provide risk management and Mitigation for the outsourcing rail project and set up a project management system.
VALUE-FOCUSED THINKING AND ANALYTIC HIERARCHY PROCESS APPROACH TO SELECTING THE BEST OPTION IN DECISION MAKING AT PLN UIP JBB: A	BENAYA SUTAMI WINOWODA (NIM: 29121419)	**1**. What are the expectations of stakeholders on the 500 kV Cawang Baru II/Cililitan-Gandul transmission line project? **2**. What are the alternative transmission line designs in the 500 kV Cawang Baru	There are several electricity projects, especially for transmission line projects within PLN UIP JBB that experience delays in completing work from the completion	Realization of electricity infrastructure projects that are timely, cost-effective, and of high quality, as well as taking into account potential social problems in transmission line project, decision-	Problem Tree Analysis; Stakeholder Analysis; Value-Focused Thinking (VFT); Analytic Hierarchy Process (AHP)	The Cynefin Framework (**Dave Snowden and Mary Boone in the late 1990s.**) - The theoretical understanding of stakeholder analysis (**Freeman, R. Edward, 1984**). - Value-Focused Thinking (VFT) is an analytical approach by focusing on desired or expected values (**Ralph L.**	1. To identify stakeholder expectations and value for this project. 2. Provide an alternative transmission line design in the 500

Title & Year	Authors	Research Questions	Problem		Methods (data collection, data analysis, decision methods)	Contributions (theory, modification of methods or conceptual framework, etc.)	Solution
			Current situation	**Ideal situation**			
CASE STUDY IN THE CAWANG-GANDUL PROJECT		II/Cililitan-Gandul transmission line project that meet stakeholder expectations? **3**. What is the best transmission line design to maximize the project completion time of the 500 kV Cawang Baru II/Cililitan-Gandul transmission line project and meet stakeholder expectations?	schedule agreed in the terms of the contract	making is needed to find the best solution in terms of an alternative design of transmission lines, especially in urban areas		**Keeney, 1992**). - Analytical Hierarchy Process (AHP) (**Thomas L. Saaty 1970s**).	kV Cawang Baru II/Cililitan-Gandul transmission line project that meets stakeholder expectations. 3. Selection of the best transmission line design to maximize the project completion time of the 500 kV Cawang Baru II/Cililitan-Gandul transmission line project and meet stakeholder expectations.
DETERMINING THE CONTRACT SERVICE STRATEGY AT THE COAL TERMINAL MAINTENANCE TO ADDRESS THE CONTRACTOR'S INABILITY TO MAINTAIN THE AVAILABILITY OF FIXED PLANTS IN SUPPORTING THE SHIPMENTS	This Study	**1**. What is the root cause of the contractor's inability to fulfil the contract's compliance at the same or higher than 97%? **2**. What are the relevant scenarios available to solve the current non-compliance contract performance problem? **3**. What preventive action plan must we prepare to avoid the	Low Contract Compliance. Increase in maintenance cost per tonne. Inappropriate spending allocation. PA Plant below 94%.	Contract Completion Satisfied (=> 97%). Maintain maintenance cost per tonne to the best practice of around $0.046. Appropriate budget absorption per cost code allocation. PA Plant >94%.	Maintenance histories (Budget and Department monthly reports). Kepner-Tregoe Problem Analysis to find out the Root cause (5-Whys Analysis, Problem Tree). AHP to choose the best availability scenarios. The Cynefin	Drivers' companies tend to do outsourcing strategies (**De Rose & Mc Laughlin, 1995**): **1**. Adding expertise **2.** Cost reduction. **3**. Comprehensive Service. **4**. Continuous improvement. **5**. Sharpen strategic focus. Organizations and companies benefits of outsourcing implementation (**Harland, 2005**): Enable focus on core business, cost reduction, increased flexibility and ability to	Find out the root cause of the contractor's inability and overcome the problem using the available scenarios. Prepare an action plan to avoid the same non-compliance contractor in 2024.

Title & Year	Authors	Research Questions	Problem **Current situation**	**Ideal situation**	Methods (data collection, data analysis, decision methods)	Contributions (theory, modification of methods or conceptual framework, etc.)	Solution
ACTIVITIES AT PTKPC		same non-compliance contractor in 2024?			Framework. PESTEL analysis.	configure resources and market needs, and the provision of fresh ideas and objective creativity.	

A summary of the many journals, including their methods, goals, procedures for gathering data, study setting, and most important conclusions, is given in this Table 2.3-2.4. The objective of a 2018 study by E.G. Sonjaya and associates, which was published in "Fuzzy Analytical Hierarchy Process," was to help management at PT PLN (Persero) in Cirebon, Indonesia, choose the optimal Rayon unit. To examine six criteria considering internal, technological, and economic factors, they used the Fuzzy Analytical Hierarchy Process (FAHP). Using interviews and a review of the literature, data was acquired. Remarkably, the investigation included client viewpoints in the assessment. Based on the company's standards and customer preferences, the Kuningan Rayon unit was found to be the best option, receiving the highest final score of 98,948. This shows that, when considering both internal and external factors, FAHP can be a useful tool for objective decision-making inside businesses.

Then Lenarczy et al. conducted a study in 2022 with the goal of directing Poland's electricity generation toward the most advantageous renewable energy source. They examined different RES technologies considering political, economic, social, and environmental factors by utilizing a variety of decision-making tools. According to their findings, distributed solar, biomass, biogas, and offshore wind are the most promising options. Poland should prioritize wind power while examining the potential of biomass and biogas, as indicated by the lower rankings of geothermal and hydropower. This study emphasizes how crucial it is to take a variety of factors into account when developing renewable energy policies that are appropriate for the unique circumstances of each nation. A 2021 study produced five times as many insightful findings by devising a novel approach to determine the most useful guidelines for enhancing building energy efficiency.

Alhindi et al. sought to find the best longwall system maintenance plan by navigating the intricate world of underground mining in a 2020 study. A major challenge was striking a balance between important factors such as cost, reliability, safety, and production efficiency. They used an expert opinion and data structuring technique called the Analytical Hierarchy

Process (AHP) to address this. Through an exploration of these insights, Alhindi et al. were able to determine which maintenance strategy would work best in their situation. Their findings could result in improved safety, more efficient operations, and more affordable maintenance for coal mines worldwide. The ability of data-driven decision-making to optimize crucial industrial processes is demonstrated by this study. Sarawak State is the best place for Malaysia's future fuel cell-based electricity generation system, according to Shafie et al.'s (2022) analysis, which gave equal weight to economic and environmental considerations. To prioritize risks in a Greek crude oil plant, Panagiotis K. et al. (2020) developed a novel tool called XPA-HAZOP. This tool helps allocate resources and ensures safer operations for the chemical industry.

By using a data-driven approach, Mishra et al. (2015) made machine maintenance decisions in India easier to make. They showed how AHP, and other tools can assist businesses in selecting the best course of action while taking economic, technological, and environmental factors into account while Modak et al. (2017) developed a framework using BSC and FAHP to evaluate the possible effects of outsourcing on the coal mining sector in India, considering economic, social, and environmental factors in order to maximize domestic coal use and performance.

And for the previous theses, to enhance its project selection procedure for consultants and contractors, PT. JICT, an Indonesian company, conducted a study in 2017 by Dewi. Due to inadequate skilled labour or subpar materials, several previous projects had experienced delays. Dewi's study sought to determine the most appropriate standards and ratios for assessing possible collaborators, guaranteeing that all upcoming undertakings were finished on schedule and economically. Through quantitative analysis and surveying stakeholders, Dewi created a new weighted multi-criteria selection process that takes reputation, cost, and task performance into account. By giving competent consultants and contractors top priority, PT. JICT was able to ensure successful project execution.

Conversely, Wisnu Hartomo (2009) discussed how PT. Freeport Indonesia did not have a system in place to assess the performance of its maintenance contractors in the Concentrating Division. Potential inefficiencies and a lack of input for development resulted from this. Hartomo's resolution? Ensuring contractors are in line with the department's objectives, permitting frequent performance reviews, and putting the Integrated Performance Measurement System (IPMS) framework into practice. This change attempted to optimize outsourcing's positive effects while reducing its drawbacks, resulting in more productive and successful maintenance operations.

An additional study Teguh Iman Sudjudi addressed the issue of inadequate risk management for the outsourcing of a significant rail project in Indonesia in 2011. He discovered that engineers only used their gut feelings, which resulted in delays and poor quality in previous projects. What is Sudjudi's solution? Establish a thorough framework that integrates risk identification and mitigation techniques with the "Outsourcing Life Cycle." By using risk matrices, weighted scores, and selection criteria, this strategy attempted to identify potential risks at every stage and implement efficient mitigation plans. Both service quality and project budget adherence were guaranteed by a quantifiable vendor classification system. In the end, Sudjudi's methodology changed outsourcing from a hazardous bet to a tactical instrument for project success and primary business emphasis.

Finally, Benaya Sutami Winowoda (2019) used an AHP decision-making method in conjunction with a value-focused approach to address delays in PLN UIP JBB's electricity transmission line projects. Infrastructure development became more effective and timelier because of the identification of stakeholder expectations, the proposal of alternate designs, and the final selection of the best option that matched everyone's needs and maximized project completion time.

From all the journals and theses discussed above, there has not been any research addressing how to find the root cause of a contractor's inability to carry out its duties and functions, especially when the contractor is a single

service provider. Therefore, in this research, the researcher focuses on discussing this matter and how to address the issue to ensure there will be no disturbance with fixed plant maintenance to support the shipment activities.

II.3 Conceptual Framework

There are several reasons companies tend to use outsourcing strategies (De Rose & McLaughlin, 1995), such as Adding expertise where the internal company has limited sources. Cost reduction where external providers can be more effective; Internal capacity is constrained to respond to demand and market prices; Comprehensive service; Continuous improvement where externals always update the latest technology; and sharpening company strategy where internal resources can focus on core business. As the contract runs from December 2021 until now, PTPB's performance is far from what was expected. The PA of the plant, which is below target, has low contract compliance and unequal budget absorption. We have tried to overcome this condition by doing integrative and event shifting to distributive negotiation, in which the focus was primarily on two-person zero-sum games where there are only two players and the total payoff to one player is equal to the total loss to the other player (John von Neumann and Oskar Morgenstern, 1944), but PTPB still has not shown any improvement. The final impact is the increase in maintenance costs per ton.

In the project's conclusion, the author aims to construct a framework that provides an overarching overview of the research methods employed for decision-making at PTKPC. This framework will be developed using various analytical tools and decision-making methodologies identified in the literature review. The conceptual framework the author intends to present is a fusion of multiple methodological approaches and conceptual frameworks, including:

- Gap Analysis: Gap analysis is a strategic problem-solving framework that identifies the difference between an organization's current state and its desired future state. It involves the following steps which are Understand the current state, Define the future state (goals and objectives), Analyse the gap between them, Identify the causes of the gap, and Create action plans to bridge the gap.
- Problem Tree / Tree Diagram (Silverman, 1994): The process of determining and analysing the causes of a problem involves creating a Problem Tree, which helps structure the understanding of the issue.
- Stakeholder analysis: The process of identifying and evaluating relevant parties involved in a project or organization. It involves understanding their interests, strengths, and relationships, which helps in relationship management and decision-making.
- Focus Group Discussion (Morgan, 1988): To explore all possible alternative solutions from the involved stakeholders, which will then be considered for potential recommendations and further tested in the subsequent steps to determine the best option.
- Analytical Hierarchy Process (Thomas L. Saaty, 1970): This approach aims to facilitate the resolution of intricate decision-making issues by methodically structuring and contrasting diverse preferences.

The details of the conceptual framework can be seen in Figure 2.8. In this research, the business issue arises after a change in PTKPC's business permit from the government, followed by the implementation of gap analysis methods to identify the problem. The next step is to determine the root cause of the issue using the problem tree method. Once the root cause is identified, the researcher will engage all stakeholders through semi-structured interviews in FGD to explore potential alternatives that can be implemented at this time.

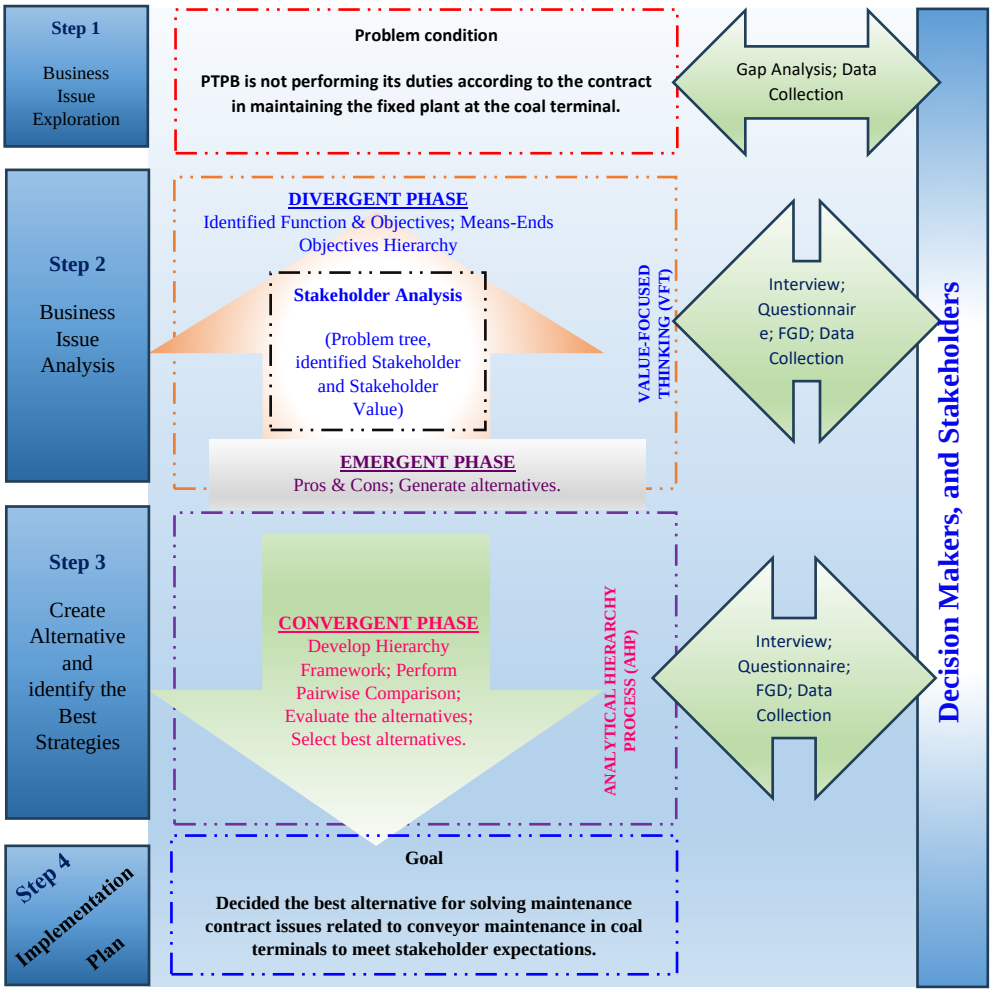


Figure 2. 7 Conceptual Framework

(Source: Author)

From all the potential alternatives, they will be tested using the Analytical Hierarchy Process to find the best alternative for problem resolution.

Chapter III Research Methodology

A suitable research approach and thorough methodology are fundamental aspects of designing and conducting this research. When deciding on the appropriate research approach, researchers must consider the research's purpose and the data sources that will be utilized. In this case, the research's purpose is to assist the CTMD's management in making decisions regarding issues with the contractor's performance.

The research commenced by conducting a thorough analysis of the current situation to identify existing issues through gap analysis. This study will primarily concentrate on evaluating PTPB's performance, as it significantly influences the overall performance of the CTMD, particularly in terms of plant physical availability, and maintenance costs. Notably, the maintenance of fixed plants at the Coal Terminal, PTPB, constitutes a substantial portion of the work (67%). To ensure the CTMD meets its Key Performance Indicators (KPIs), maintaining the contractor's performance at a high standard is essential.

After recognizing the existence of a gap signifying a problem, the researcher will refer to pertinent literature to address this issue. Following this, the researcher will formulate research questions to resolve the identified problems and outline the research objectives. Furthermore, the researcher will employ quantitative methods to gather data, including interviews and focus group discussions. Interviews will be conducted in a semi-structured format. The final step in this process involves scenario testing to determine the most suitable recommendation for addressing the current issue and formulating an action plan for the forthcoming new contract service framework.

III.1 Research Design

In this section, the research is strategically designed with a crucial objective: to identify, analyze, and compile a methodological framework systematically and methodically. At this juncture, it becomes imperative to

define the variables for study and determine their measurement methods. Equally significant is the careful selection of representative samples to ensure the research's validity. Subsequently, the data collection phase can be implemented through diverse approaches such as interviews and focused group discussions. Following data collection, the analysis stage commences, employing suitable statistical techniques tailored to the acquired data type. The primary aim of this analysis is to test alternative scenarios addressing the previously identified research questions. Furthermore, the analysis results serve as a basis for drawing conclusions and providing recommendations relevant to decision-makers. The various phases of the research design are depicted in Figure 3.1 below.

The stages of Research Design for this final project can be described as follows:

1. Business Issue Exploration

   Exploring business issues is a crucial step for the success of any organization. It involves identifying potential challenges and opportunities that could affect the company's performance. By investigating these issues, companies can develop strategies to mitigate risks and seize opportunities. During this stage, the author will delve into the potential issues that may arise in contract service performance. This comprehensive issue identification will facilitate the generation of suitable strategic alternatives. The AHP method is particularly effective in guiding the decision-making process, especially in the case study project the author has presented. Through brainstorming with stakeholders and gathering secondary data, the impact on aspects such as plant physical availability and maintenance costs becomes evident. This method helps in determining the best alternative.

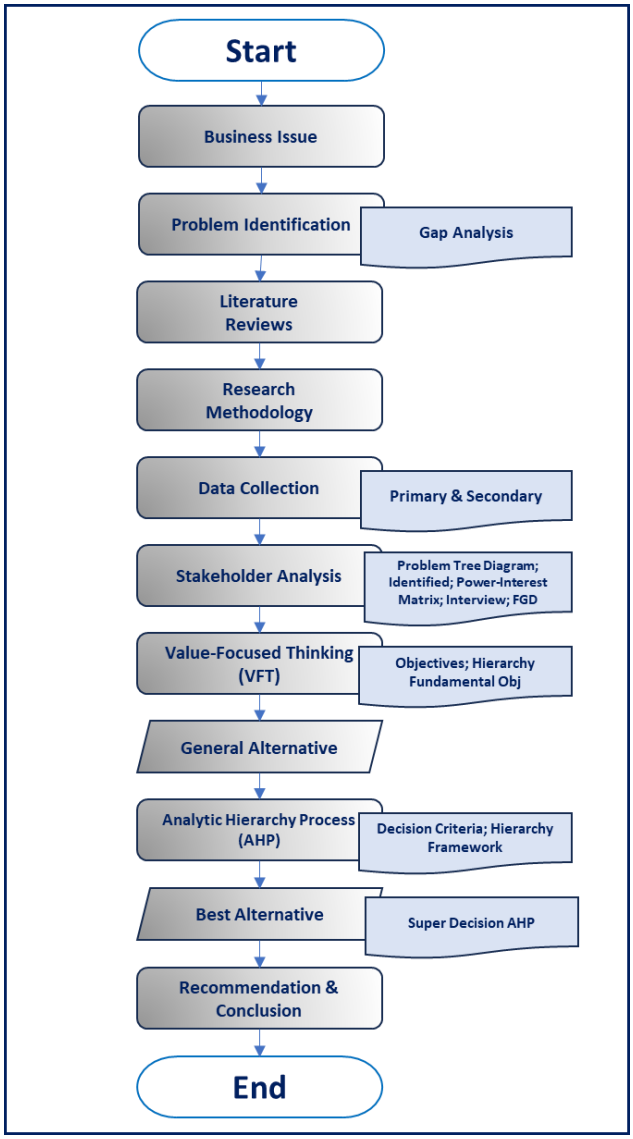


Figure 3. 1 Research Design

(Source: Author)

2. Problem Identification

Problem identification is done through gap analysis. This means breaking the problem into smaller parts and studying each part to figure out what's causing the problem. You can do this by asking a series of questions like "What is the problem?" "What are the symptoms?" "What's causing the problem?" and "What's making it worse?" Once you've answered all these questions, you can make a problem tree to show how all the different parts of the problem are connected. This helps pinpoint where we need to take action and what kind of action will work best. Using this

method, we can create specific solutions that tackle the root causes of the problem, rather than just dealing with its symptoms.

3. Literature Reviews and Determining Research Objectives

   Every research project must include a literature review and research objectives. While research objectives establish the study goal and provide answers to research questions, literature reviews entail a thorough examination of the body of current literature on the subject of interest. In order to fully comprehend the study topic and create workable solutions, these two procedures are essential. Careful planning and attention to detail are necessary for both literature reviews and research objectives. Researchers need to make sure that the information they are using is dependable and that the goals of their studies align with the issues that they are trying to answer. They must also take action to guarantee the validity and dependability of their findings.

4. Data Collection & Analysis

   Data collection is a crucial part of every research Endeavor. Obtaining and evaluating data is the process of collecting data in order to address research issues. Researchers need to make sure that the information they are using is dependable and that the techniques they are employing to acquire data are relevant to the issues they are trying to answer. Many important individuals will participate in focus groups and interviews that will be used to collect data. Semi-structured interviews are conducted to make sure the important person feels free to speak candidly and without fear of retaliation. There will be a transcription created following the interview. Following the acquisition of the necessary data, the researcher will conduct analysis and verification by determining whether the information from one source is compatible with the data from the others.

5. Root Cause Analysis

   In this research, before determining corrective action, it needs to find out detail the root cause. Knowing the root cause will help to answer the

research questions correct. In determining the root cause, researchers will use the problem tree or tree diagram method.

6. Stakeholder Analysis

After identifying the root cause, involving key individuals from stakeholders, such as the Site Manager contractor, contractor planner, contract custodian, CT Department planner, and contract division, an interview will be conducted uses a scoring technique with a scale of 1-4 to determine the level of importance and stakeholder influence (Fedora dan Hudiyono 2019) to know the level of power and level of interest as shown in the Tabel 3.1 below.

Table 3. 1 Score rating, level of power, and level of interest

(Source: Fedora dan Hudiyono 2019)

Power level	Interest level	Score
Less power	Less Interest	1
Quite a bit of power	Quite a bit of Interest	2
Strong Power	Strong Interest	3
Extremely strong	Extremely Interest	4

In order to determine the value for Y and *X* for each stakeholder, the level of interest and power of each stakeholder are totaled up, averaged, and then used in equation (1). Because more than one important respondent evaluates the degree of authority and interest, equation (1) is employed. The following step involves computing the output of equation (1), adding it, and averaging it using equation (2) to produce the values $\bar{\bar{Y}}$ and $\bar{\bar{x}}$. Equation (2) yields $\bar{\bar{Y}}$ and $\bar{\bar{x}}$, which are utilized as quadrant boundaries in cartesian diagrams.

$$\bar{X} = \frac{\Sigma x_1}{n}; \qquad \bar{Y} = \frac{\Sigma yi}{n} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

$$\bar{\bar{x}} = \frac{\Sigma \bar{x} i}{k}; \qquad \bar{\bar{Y}} = \frac{\Sigma y_i}{k} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Remarks:

Xi = Value of the i-th interest level

Yi = Value of the i-th power level

$\bar{X}$ = Average value of interest

$\bar{Y}$ = Average value of power

$\bar{\bar{x}}$ = Average of the average value of interest

$\bar{\bar{Y}}$ = Average of the average value of power

n = Number of key respondents

k = Number of stakeholders involved

The next step is, generate the table assessment of the level of power and interest as shown in the Tabel 3.2 below.

Table 3. 2 Assessments of the level of power and interest

(Source: Author)

Stakeholder	**1**	**2**	**3**		**1**	**2**	**3**	
	Level of Power (Yi)				Level of Interest (Xi)			
Person	Y1	Y2	Y3		X1	X2	X3	
Person	Y..	Y..	Y..	$\bar{\bar{Y}}$	X..	X..	X..	$\bar{\bar{x}}$
Average	$\bar{Y}$..	$\bar{Y}$..	$\bar{Y}$..		$\bar{X}$..	$\bar{X}$..	$\bar{X}$..	
Category	…	…	…					

The power level value (Yi) and interest level value (Xi) of each stakeholder are then projected into the power-interest matrix as shown in Figure 3.2 after grades $\bar{\bar{x}}$ and $\bar{\bar{Y}}$ have been determined as a quadrant boundary in the cartesian diagram. According to (Mendelow, A. L., 1991)., the power-interest matrix uses a quadrant divide to represent each stakeholder's position and role. The x-axis indicates interest, while the y-axis represents power.

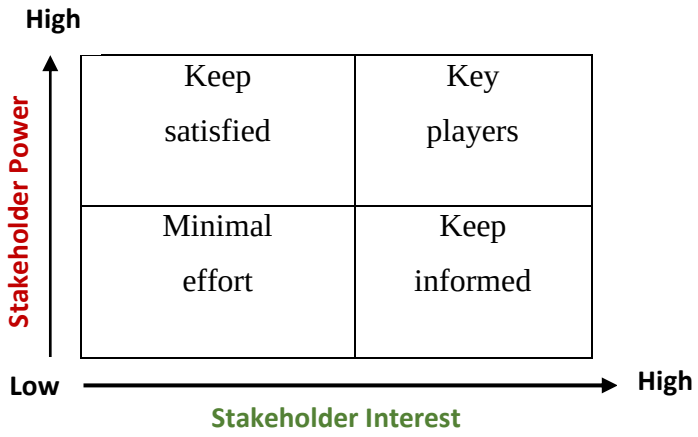


Figure 3. 2 Matrix Power-Interest Stakeholder

(Source: Mendelow,A.L., 1991)

There are four categories of stakeholders: minimal effort (quadrant IV), keep satisfied (quadrant III), keep informed (quadrant II), and key players (quadrant I). key players are powerful and have a lot of interest; keep informed has high interest but low power, keep satisfied has a high level of power but low interest while minimal effort has low power and interest.

Assembling and classifying stakeholder expectations is the next stage (defined in terms of stakeholder value) based on the findings of previously conducted stakeholder interviews with participants who belong to high power and interest stakeholder groups.

High-power stakeholder groups may be able to participate as parties who interfere during the policymaking and implementation phases, according to Hidayat et al. (2020). It is important to take into account the influence and degree of interest of stakeholders in order to foresee potential issues (Bryson 2004).

7. Generate Possible Alternatives

   In determining possible alternatives, the research methodology will employ qualitative data collection, involving focused group discussions (FGD) and semi-structured interviews with key-person stakeholders.

Subsequently, all alternatives will be evaluated using the Value-Focused Thinking (VFT) methodology.

8. Determine the Best Alternative

   The next phase is to gather any viable alternative strategies that result from the key person discussion after the data collection and analysis procedure has been completed. The Analytical Hierarchy Process (AHP), or the Super Decisions AHP, will be used to identify the best alternative out of all those that could be.

9. Recommendation

   The last stage of this study is to formulate a proposal based on the solution that was best chosen, ensuring that it is implemented correctly.

III.2 Data Collection Method

Data collection methods play a crucial role in acquiring precise and dependable information for diverse research and analytical objectives. Choosing suitable data collection methods is imperative for ensuring the excellence and validity of the gathered data, ultimately facilitating a comprehensive understanding and well-informed decision-making.

The data for this study was collected from December 2021 to June 2023 through the CTMD regular monthly report, as PTPB commenced its services in this department. The subsequent step involves gathering the pro forma invoice and contract document on the next date to ascertain the fixed monthly fee. This fee encompasses factors such as the manpower count, tools, spare parts, and equipment.

The author will employ diverse data collection techniques in this study, encompassing:

1. Literature Review

   Conducting a literature review is a research methodology that encompasses the gathering, assessment, and analysis of various literary

sources pertinent to the research topic under investigation. In literature reviews, researchers compile information from books, scientific journals, articles, laws and regulations, and other sources relevant to the subject of study.

2. Interview

   Semi-Structured Interviews will be conducted in seven stages, which will begin with determining the theme and designing the questions. For example, the theme for the first research question is finding out the actual internal condition of the contractor by asking several key questions as described in the Interview Questions table. Then, conducting an interview, which is semi-structured, is carried out to ensure that the key person from PTPB does not feel pressured and can tell the truth as it is. After the interview, the transcription will be made. After obtaining the information needed, the researcher will carry out analysis and verification based on checking from each source whether they are compatible with each other. Based on this verification, the researcher will make a complete report.

3. Focus Group Discussion (FGD)

   A is conducted to devise a business solution for challenges encountered in the CTMD, specifically concerning the contractor's capability to meet contractual service obligations. The discussion is grounded in the interview outcomes of team members. The FGD is organized to deliberate on the previously conducted interviews with the team and to address suggestions provided by the team during the interviews.

The data gathered through the aforementioned research methods is categorized into two types: primary data and secondary data.

1. Primary Data

   The first primary data that needs to be collected is the contract performance evaluation of PTPB, which is conducted regularly every six months. After that, continue to collect CTMD's monthly report from December 2021 until June 2023, since PTPB has been starting their service in the CT Maintenance department. The next date is to collect

the pro forma invoice and contract document to determine the fixed monthly fee, which consists of the number of manpower, tools, spare parts, and equipment.

2. Secondary Data

   Secondary data were acquired through book reviews, scientific journals, statutory documents, literature studies, and insights gained from interviews with key individuals. Semi-structured interviews will be conducted in seven phases, commencing with theme determination and question formulation. For instance, the theme for the initial research question involves uncovering the genuine internal condition of the contractor.

III.3 Data Analysis Method

The data analysis phase follows the data collection stage, constituting a sequential progression. Typically, the phases of data analysis encompass a methodical and organized set of steps to systematically handle, analyze, and interpret data. It is essential to recognize that the specific stages of data analysis can differ, contingent on the methods, approaches employed, and the complexity of the research problem. In this study, the author analysed data using two approaches: a qualitative one and a quantitative one (Creswell, J. W., 2014).

1. Qualitative data in this study is acquired through interviews, observations, or document analysis. The information gathered from each respondent is then processed using content analysis methods to generate valid and relevant data for the study's purpose.

   The observation results in this study will help identify behaviours, events, or processes within the object of conservation research. Additionally, the interviews and FGD with key respondents and decision-makers, will elucidate the causes and effects of the existing issue and find out the root cause using Problem Tree / Tree Diagram to answer the first research question.

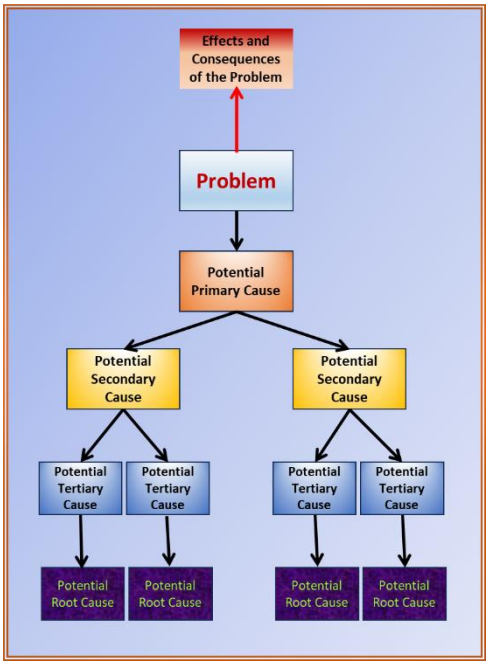


Figure 3. 3 Problem Tree / Tree Diagram

(Source: Author)

The research will explore ways to address any issue related to the research questions such as discover methods to prevent future contract challenges, examine the pros and cons of alternatives, and at the end establish the hierarchical structure of AHP. Structured interviews and Focus Group Discussions (FGD) were conducted to perform pairwise comparisons of the criteria and alternative solutions. The goal was to identify the most optimal alternative by utilizing the Analytic Hierarchy Process (AHP) approach.

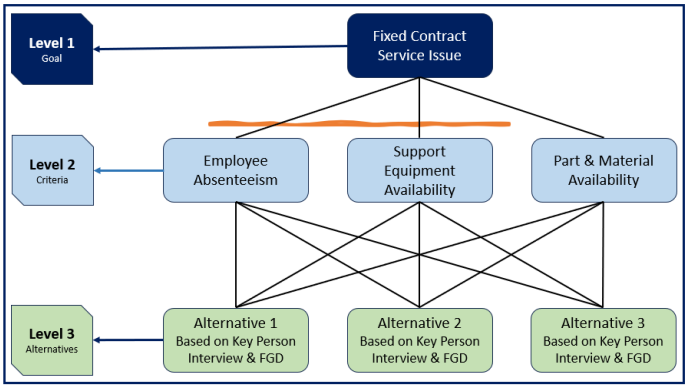


Figure 3. 4 Structure hierarchy of AHP

(Source: Author)

2. The quantitative method employed for data analysis in this study encompasses the gathering and statistical analysis of numerical data or data based on measurable metrics. This approach emphasizes generalizations and mathematical modelling. The quantitative data for this research was sourced from the Contractor Performance Evaluation, Monthly Invoice, as well as data from interviews and focus group discussions. Building upon the AHP hierarchy structure formulated during the previous qualitative analysis, the quantitative analysis involved listing potential alternatives derived from input stakeholders and key individuals.

   Once all data is collected, the subsequent stage involves processing the data into a pairwise comparison matrix. Before constructing the matrix, the initial step is to create a comparison table showcasing numerical rating results at both the criteria and alternative levels for each respondent based on interview and FDG. The selection of the Interview and FGD methods in conducting Pairwise Numerical comparisons aims to ensure that all issues are captured for all stakeholders through an open discussion.

Table 3. 3 Pairwise Numerical Rating

(Source: T.L Saaty, 1970)

Intensity of Importance	Definition	Explanation
1	Equal Importance	Two activities contribute equally to the objective
3	Moderate Importance	Experience and judgment slightly favour one activity over another
5	Essential Importance	Experience and judgment strongly favour one activity over another
7	Very Strong Importance	An activity is favoured very strongly over another; its dominance demonstrated in practice
9	Extreme Importance	The evidence favouring one activity over another is of the highest possible order of affirmation
2, 4, 6, 8	Intermediate Values	When compromise is needed between two

After completing the Pairwise Comparison, proceed to the Synthesizing Procedure by summarizing the values in each column and calculating the average for the elements in each row.

Table 3. 4 Pairwise Comparison

(Source: Author)

Criteria	Alternative 1	Alternative 2	Alternative 3
Alternative 1	1	2	8
Alternative 2	1/2	1	6
Alternative 3	1/8	1/6	1
Column totals	**13/8**	**19/6**	**15**

Table 3. 5 Pairwise Comparison Synthesizing Procedure

(Source: Author)

Criteria	Alternative 1	Alternative 2	Alternative 3	**Row Avg.**
Alternative 1	8/13 = 0.615	12/19 = 0.632	8/15 = 0.533	**0.593**
Alternative 2	4/13 = 0.308	6/19 = 0.316	6/15 = 0.400	**0.341**
Alternative 3	1/13 = 0.077	1/19 = 0.053	1/15 = 0.067	**0.066**
			Totals	**1.000**

Perform a Consistency Check, which is a crucial step influencing the overall quality of the decision. Evaluating the consistency of judgments made by the decision maker throughout the pairwise comparisons is a significant aspect. AHP provides a method to gauge the consistency of these judgments through the calculation of a consistency ratio.

- Compute the consistency index $CI = \frac{\lambda_{max} - n}{n-1}$

Where n is the number of items being compared

- Compute the consistency ratio $CR = \frac{CI}{RI}$

Where RI is the random index, which is the consistency index of a randomly generated pairwise comparison matrix. It can be shown that RI depends on the number of elements. being compared and takes on the following values.

Random index (RI) is the consistency index of a randomly generated pairwise comparison matrix. RI depends on the number of elements being compared (i.e., the size of the pairwise comparison matrix) and takes on the following values:

Table 3. 6 Average random consistency index (R.I)

(Source: Author)

n	1	2	3	4	5	6	7	8	9	10
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49

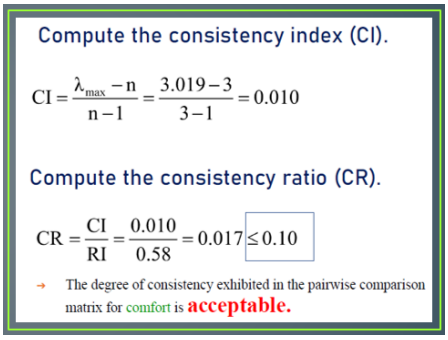


Figure 3. 5 Example: Consistency Checking

(Source: Author)

After that, conducting Alternative solution Assessment through a pairwise comparison of all available alternatives becomes a criterion that is concerned by all stakeholders based on the previous interviews and FGDs, so that rankings can be determined based on those criteria.

Table 3. 7 Concern of the criterion priority.

(Source: Author)

Criterion	Concern 1	Concern 2	Concern 3	Average
Concern 1	0.100	0.174	0.055	**0.097**
Concern 2	0.300	0.522	0.655	**0.487**
Concern 3	0.400	0.174	0.218	**0.286**

Following this, the development of a priority ranking is undertaken concerning the overarching goal of the decision alternative in relation to that criterion. By ranking these priority values, we obtain the AHP ranking of the decision alternatives.

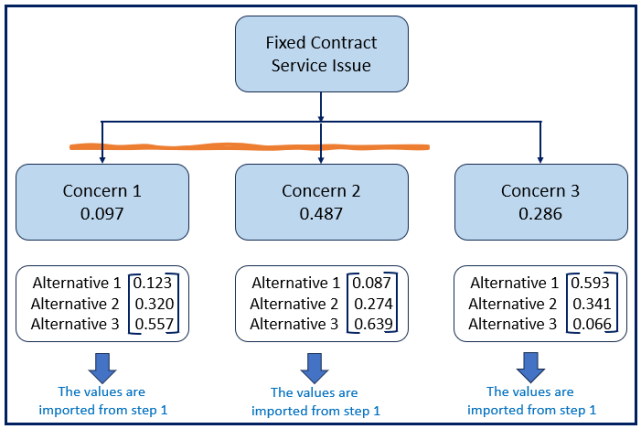


Figure 3. 6 Ranking of Criteria

(Source: Author)

The subsequent stage involves analysing and evaluating the data with the assistance of Super Decisions AHP software. The outcomes of this analysis can assist decision-makers in identifying the optimal alternative to address the current issue and formulating an action plan to prevent a recurrence of the same problem in future contracts.

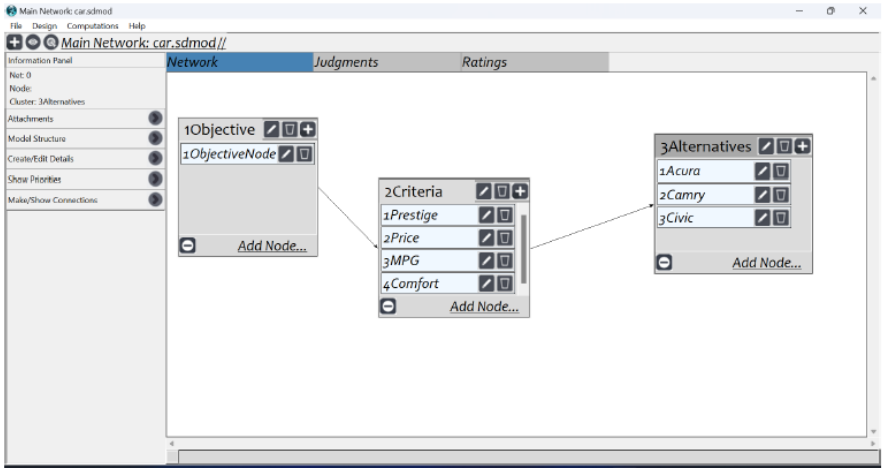


Figure 3. 7 Super Decisions AHP Software

(Source: Super Decision AHP)

Chapter IV Results and Discussion

This chapter will present the obtained research results and a detailed analysis of the findings. This chapter's main goal is to provide a thorough understanding of the research findings in relation to the given research question. The identified results will be subjected to a critical analysis and linked to well-established theories and earlier studies in the same field in an effort to generate new insights and advance understanding in this area of research. The main objective of this entire chapter is to provide a thorough representation and analysis of the research results, allowing for the advancement of science in this particular area of inquiry.

IV.1 Analysis

Business Issues Exploration

As a price taker in the worldwide coal mining industry, PTKPC is closely related to market swings impacted by ICI, NEX, GCNC, and Platt's 5900 indexes. There are difficulties brought about by the industry's general move towards renewable energy, such as the declining demand for coal and possible financial problems related to stranded assets. Due to occurrences like the Russia-Ukraine crisis in 2022, where high prices coupled with decreased demand, PTKPC's ability to adjust to such global dynamics becomes critical to its profitability. The company saw a significant change in its financial environment at the same time, moving from PKP2B to IUPK permits, which resulted in extra fees and taxes. This change had a significant impact on the company's expenses due to the additional royalty fee and VAT in the new IUPK permit, as well as the implementation of Additional Tax on the Price Difference of Coal Reference Profit Sharing, which previously did not exist, and several changes to taxes related to land and buildings, including regional tax, which follows general standards as seen in Table 4.1 below.

Table 4. 1 Comparison of PTKPC PKP2B – IUPK

(Source: Internal data)

Comparison of PKP2B - IUPK		
Regulatory items	**PKP2B**	**IUPK**
Royalty Fee	13.50%	28% Export & 14% Domestic
Land and Building Tax (PBBKB)	7.5% (Meeting with royalties)	7.5% Becomes cost
Value Added Tax (VAT)	0%	11%
Land (PBB) and Regional Taxes	lumpsum	Following the standard calculation.
Corporate Income Tax	45%	22%
Additional Tax on the Price Difference of Coal Reference	Not applicable	According to the corporate tax rate
Profit Sharing	Not applicable	10%

Previously, two contract service companies were responsible for handling conveyor maintenance at CT, which were PTPB and PTCMP. However, this has now been streamlined, resulting in only one contractor being retained. In December 2021, the decision was made to award the contract to PTPB. PTPB had previously been involved in CTMD, albeit with a limited scope of work, and had demonstrated satisfactory performance. The detailed distribution of the scope of work in the PKP2B era and IUPK after December 2021 can be seen in Table 4.2.

Table 4. 2 Distribution of the scope of work in the PKP2B era and IUPK

(Source: Internal data)

No	Scope Of Work Contract Service at CT Maintenance	Weight	PKP2B Era (Before Dec 2021)	PT CMP Weight	IUPK Era (After Dec 2021 - Now)	**PTPB Weight**
1	Daily / Routine Inspection	6,7%	Performed by PT CMP	6,7%	Performed by PTPB	**6,7%**
2	Repair Conveyor Belt	6,7%	Performed by PT CMP	6,7%	Performed by PTPB	**6,7%**
3	Roller and Frame Replacement	6,7%	Performed by PT CMP	6,7%	Performed by PTPB	**6,7%**
4	Repair conveyor roller and frame	6,7%	Performed by organic KPC		Performed by PTPB	**6,7%**
5	Repair transfer chute	6,7%	Performed by PT CMP	6,7%	Performed by PTPB	**6,7%**
6	Belt Splicing	6,7%	Performed by PTPB		Performed by PTPB	**6,7%**

No	Scope Of Work Contract Service at CT Maintenance	Weight	PKP2B Era (Before Dec 2021)	PT CMP Weight	IUPK Era (After Dec 2021 - Now)	PTPB Weight
7	Provide splicing kit	6,7%	Performed by PT CMP	6,7%	Performed by PTPB	**6,7%**
8	Repair pulley lagging	6,7%	Performed by PT CMP	6,7%	Performed by PTPB	**6,7%**
9	Belt cleaner maintenance	6,7%	Performed by PT CMP	6,7%	Performed by PTPB	**6,7%**
10	Conveyor skirt maintenance	6,7%	Performed by PT CMP	6,7%	Performed by PTPB	**6,7%**
11	Liner maintenance	6,7%	Performed by organic KPC		Performed by PTPB	**6,7%**
12	Provide Belt Vulcanizer & support equipment	6,7%	Performed by PTPB		Performed by PTPB	**6,7%**
13	Perform Fabrication	6,7%	Performed by organic KPC		Performed by PTPB	**6,7%**
14	Perform component overhaul	6,7%	Performed by organic KPC		Performed by organic KPC	
15	Perform component replacement	6,7%	Performed by organic KPC		Performed by organic KPC	
	Total	100%		53,3%		**86,7%**

Problem Identification

The operating performance of PTKPC's fixed plant coal terminals is important to the company's capacity to operate effectively, and CT Maintenance is essential to reaching the 94% plant availability (PA) target required to accomplish the ambitious goal of 60 million metric tonnes of shipments annually. The labour force that CTMD uses to carry out its duties is made up of 26% PTKPC personnel, 8% labour supply, and 67% contract services, for a total of 156 coal terminal resources as detailed on the Tabel 4.3 below.

Table 4. 3 Coal Terminal Maintenance Resources

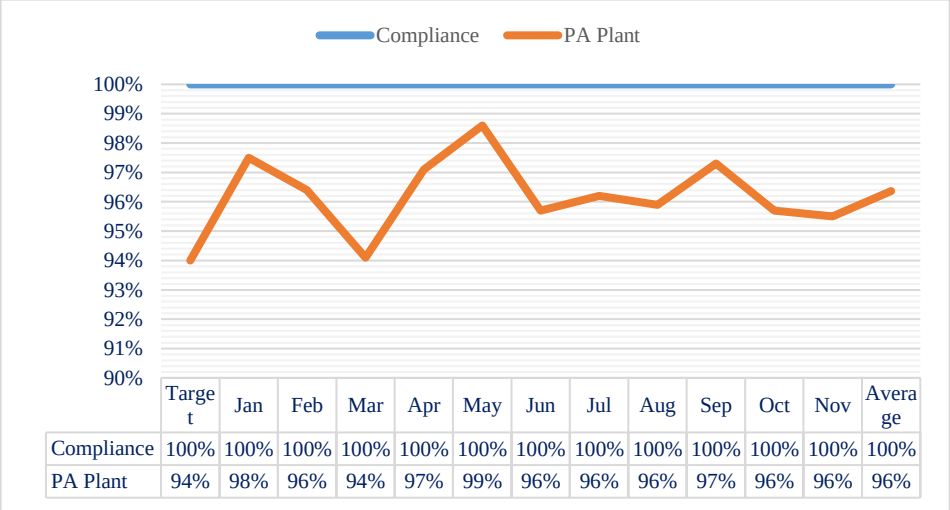
(Source: Internal data)

2023 Coal Terminal Maintenance Resources			
PTKPC Employees	Labour Supplies	Contract Services	Total
40	12	104	156
26%	8%	67%	100%

The credentials and proficiencies of these contractors are crucial because any interruptions in loading facilities could cause PTKPC to lose revenue in addition to inevitable costs like staff salaries, contractor fees, and equipment

leases. There are several significant differences between the actual state of affairs and the anticipated outcomes, nevertheless, such as a spike in maintenance expenses since December 2021 and inadequate contract compliance that affects plant physical availability. Their monthly pro forma invoice payments and overall performance evaluations are directly impacted by contract compliance, which includes the appraisal of the resources, materials, and support equipment. The success of the CTMD in fixed plant maintenance is closely linked to contract performance, as evidenced by the fact that 67% of resources come from contract services.

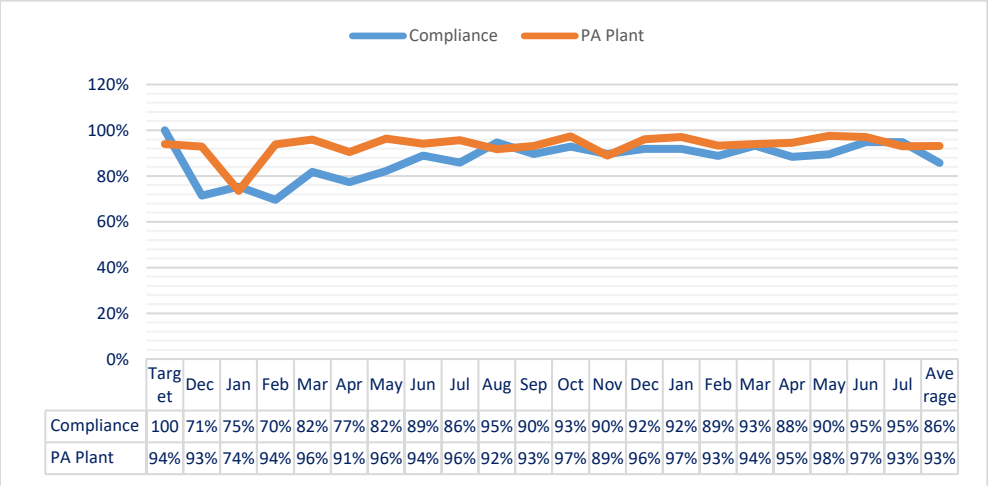
PA vs. contract compliance Prior to and including December 2021, we may note that, with plant physical availability (PA) at 93%, the average contract compliance through May 2023 has been just 86% since the new contract was started in December 2021. During the current contract's 18 months, PA Plant has fallen short of the 94% objective seven times. Contract compliance constantly achieved 100%, while PA Plants never fell below 94%, until December 2021 as shown in Figure 4.1 and Figure 4.2 below, when two contractors took up responsibility for conveyor maintenance in Connecticut. This scenario can be explained by the fact that the workload was distributed among multiple contractors, which made it simpler for them to reach the goal.



	Target	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Average
Compliance	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
PA Plant	94%	98%	96%	94%	97%	99%	96%	96%	96%	97%	96%	96%	96%

Figure 4. 1 Contract compliance vs PA before Dec 2021

(Source: Internal data)



	Target	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Average
Compliance	100	71%	75%	70%	82%	77%	82%	89%	86%	95%	90%	93%	90%	92%	92%	89%	93%	88%	90%	95%	95%	86%
PA Plant	94%	93%	74%	94%	96%	91%	96%	94%	96%	92%	93%	97%	89%	96%	97%	93%	94%	95%	98%	97%	93%	93%

Figure 4. 2 Contract compliance vs PA after Dec 2021

(Source: Internal data)

Based on the information provided above, it can be concluded that PTPB has been unable to carry out its obligations in line with the goals set by the CTMD within the terms of the contract since its appointment in December 2021 as the only contractor in charge of conveyor maintenance in the coal terminal area, under the CTMD's custodial. Thus, it is critical to act quickly to stop the current situation from getting worse in order to maintain PTKPC's shipping operations, which are heavily dependent on the physical and availability of the plant in the coal terminal.

From the data, stakeholder analysis will be conducted through interviews and FGD to delve into the interests of all stakeholders represented by several key persons as listed in Table 4.4.

Table 4. 4 List of key people to determine the causes and effects of contract issues.

(Source: Author)

Key persons Initial	Group Stakeholder	Job Description
MYH		Over 14 years of experience as a maintenance planning system in CT maintenance, currently serving as the acting manager of Coal Terminal maintenance. His role is Leading the maintenance of the fixed plant at the coal terminal
SR		With over 6 years of experience as a senior mechanical engineer supporting maintenance work for the fixed plant in the CPHD area, the individual is currently acting as a Maintenance Planning Superintendent in the Coal Terminal Department.

Key persons Initial	Group Stakeholder	Job Description
NS	CT Maintenance	With 9 years of experience as a senior mechanical engineer tasked in the infrastructure department to support maintenance work for support equipment, the individual is currently acting as the Lubuk Tutung Port Facility Superintendent, responsible for ensuring the availability of fixed plant in Lubuk Tutung.
BY		15 years of work experience, starting as a technician, then promoted to leading hand, and currently holding the position of Maintenance Planner in Coal Terminal Maintenance, responsible for scheduling maintenance for fixed plant.
TH		16 years of work experience, starting as a technician, then promoted to leading hand, and currently holding the position of Mechanical supervisor in Coal Terminal Maintenance, responsible for leading maintenance activities in fixed plant.
RA		30 years of work experience, starting as a technician, then promoted to leading hand, and currently holding the position of Mechanical supervisor in Coal Terminal Maintenance, responsible for leading maintenance activities in fixed plant.
MLW		Over 14 years of work experience, starting as a technician, then promoted to leading hand, and currently holding the position of Mechanical supervisor in Coal Terminal Maintenance, responsible for leading maintenance activities in fixed plant.
RP		12 years of work experience, starting as a technician, then promoted to leading hand, and currently holding the position of Mechanical supervisor in Coal Terminal Maintenance, responsible for leading maintenance activities in fixed plant.
BS	CT Operation	Over 17 years of experience as a maintenance engineer system across CPHD, currently serving as the manager of Coal Terminal operation. His role is Leading the operation of the fixed plant at the coal terminal.
HK		Over 15 years serving as a Shift Operation Superintendent to ensure that shipping activities run according to plan.
ARF		Over 32 years serving as a Shift Operation Superintendent to ensure that shipping activities run according to plan
YM		Over 32 years serving as a Shift Operation Superintendent to ensure that shipping activities run according to plan
HRN	Coal Quality Control	Over 32 years of experience working in various positions in CPHD, currently holds the position of CQC Manager, responsible for ensuring the availability of products to be shipped according to the vessel’s laycan.
PD		Over 17 years of experience working in coal quality engineer, currently holds the position of CQC superintendent, responsible for ensuring the availability of products to be shipped according to the vessel's laycan.
DS		11 years of experience working in coal quality engineer, currently holds the position of CQC superintendent, responsible for ensuring the availability of products to be shipped according to the vessel's laycan.
WK	Marketing	31 years of service in the marketing department responsible for coal sales and coordinating vessel laycan according to product forecasts availability, currently holds the position of Marketing Manager.
RR		11 years of service in the marketing department responsible for coal sales and coordinating vessel laycan according to product forecasts availability, currently holds the position of Marketing Superintendent.

Key persons Initial	Group Stakeholder	Job Description
NY	Contract	With 15 years of experience working in the contract department responsible for the contract process from tendering to appointment, and directly accountable to the Contract Committee. Currently, his role as contract superintendent.
HS		11 years of experience working in the contract department responsible for the contract process from tendering to appointment. Currently, his role as contract senior engineer.
EF	Finance	Over 13 years of experience working in the financial department responsible for invoicing, receipts, and payments. His role as General Manager Financial Division and directly report to the Chief Financial Officer.
SH		Over 24 years of experience working in the financial department responsible for invoicing, receipts, and payments. His role as Manager Financial department that lead the department matters.
CA		27 years of experience working in the financial department responsible for invoicing, receipts, and payments. His role as superintendent financial department that lead the section matters.
AJ	PTPB	Having 14 years of experience in PTPB and currently holds as a site manager responsible for leading, executing, and controlling the PTPB contracts at KPC.
YK		Having 6 years of experience in PTPB and currently holds as a site planner responsible for planning, procuring, and scheduling the maintenance task the PTPB contracts at KPC.
MS		9 years of work experience, starting as a technician, then promoted to leading hand, and currently holding the position of Mechanical supervisor in Coal Terminal Maintenance, responsible for leading maintenance activities that held by PTPB in fixed plant.
RI		15 years of work experience, starting as a technician, then promoted to leading hand, and currently holding the position of Mechanical supervisor in Coal Terminal Maintenance, responsible for leading maintenance activities that held by PTPB in fixed plant.

Problem Tree Analysis

Based on focus group discussions with stakeholders and several literature reviews, the potential causes of PTPB being unable to carry out its duties and responsibilities as stated in the contract can be described as follows:

1. **Social and environmental Factors:** These influence our interactions with the environment and one another include culture, demography, and social structures. Justice-seeking social movements shape public policy, and inequality problems are frequently linked to environmental problems. Concerns like social change for sustainability, community-based conservation, and environmental justice are examples of how the

two domains interact. Employing non-skilled labour from the local community is a requirement for the PTPB working in the PTKPC concession area in East Kutai. Due to this circumstance, the PTPB finds it difficult to take severe measures against local workers who are prone to going on strike when their rights—such as being paid on time—are not met.

2. **Regulation and Licensing Factors:** The lengthy and intricate licencing process was very important at the time when PTKPC switched from PKP2B to IUPK. This was due to the fact that the conditions of the PBK2B PTKPC contract were typically adhered to all cooperation agreements with PTKPC contractors. Early in 2020, the application for a licence extension had been started, but until December 2021, there was still no assurance that PTKPC's licence would be extended by the government. PTKPC management had to wait for the licencing process, which involves a number of parties, including environmental agencies, local governments, government authorities, and other stakeholders. PTKPC operated from December 2021 to March 2022 using partial contracts (short contracts) from the Directorate General of Mineral and Energy because complete licence certainty was not issued until March 2022.

   Moreover, PTKPC found it difficult to decide how to proceed with its operations at the time due to the uncertainties laws and policies. PTKPC was forced to accept the regulations without debate in the event that they abruptly altered or there was uncertainty about the requirements that needed to be fulfilled. As a result, in order to ensure company could operate at that time, contractor duties were streamlined.

3. **Contractual Factor:** The challenges faced by PTPB in fulfilling its contractual obligations are multifaceted. One contributing factor is the extensive scope of work assigned to PTPB, encompassing manpower provision, supply of spare components, fabrication, and the provision of support tools such as cars. Despite PTKPC's three-decade business history, this was the company's first experience work with a sole

contractor in a specific scope of work. Moreover, the unpredictability of coal prices forces PTPB to allocate substantial capital for operations, leading to delayed invoice payments. PTKPC's tendency to choose the lowest-priced contractor during tenders also intensifies competition among contractors, who strategically allocate a vast scope of work to ensure competitive pricing through long-term contracts.

The expansion of the contract scope in the PKP2B era caught PTPB off guard, requiring significant capital for material supply and skilled labour. Payments, as per contract terms, are issued after completion, with a waiting period of sixty to ninety calendar days. This delayed payment cycle, coupled with cash flow problems, led PTPB to postpone employee salaries, triggering strikes and impacting staff attendance as shown in the figure 1.31 below Where the obligation of PTPB to provide labour supply and fabrication work rarely meets the target as stipulated in the contract.

4. **Technical Factors:** The failure of PTPB to perform within the terms of the contract can be greatly impacted by these issues. It is difficult for PTPB to fully meet the standards and requirements outlined in the negotiated agreement due to the extension of the scope of work, which was initially limited to conveyor belt splicing expertise, to encompass material provision and fabrication work. The management of PTPB proved skilled in persuading PTKPC that they could manage the full scope of work during the first round of tenders. PTKPC, on the other hand, had never done this before since operation in 1988. Because it provided the most competitive pricing at the time, PTPB was selected as the contract winner. In addition, problems with material acquisition occur when necessary, materials are delayed in arriving on schedule. The CTMD is thus forced to obtain the materials at considerably higher costs—sometimes even more than twice the agreed upon amount—from other sources. These are drastic measures that the CTMD must take to guarantee the plant's physical availability, and since these kinds of occurrences happen often, maintenance expenses will go up. According

to Figure 4.3, which shows how PTPB's responsibility to supply equipment support (light vehicles, buses, including splicing machines) and material between December 2021 and August 2023 falls below the expectations based on the contract requirement, Figure 4.4 shows where the obligation of PTPB to provide labour supply and fabrication work rarely meets the target as well.

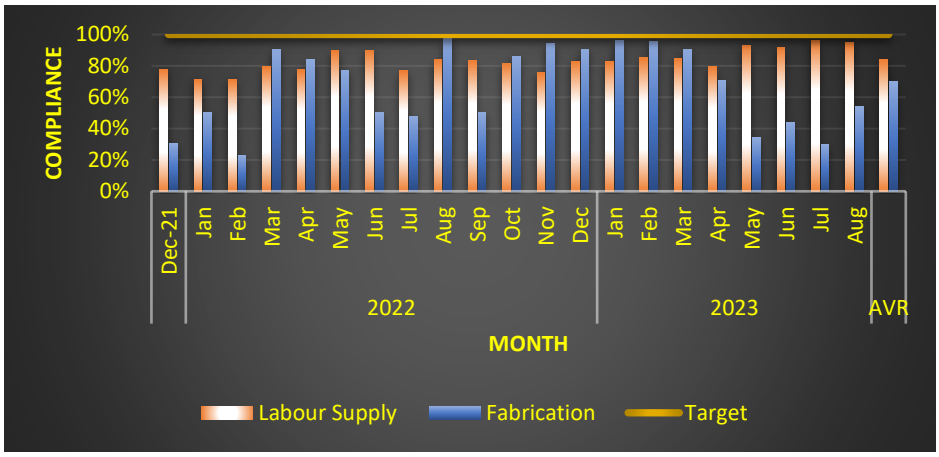


Figure 4. 3 Target vs Actual of labour supply and fabrication Job from Dec 21 to Aug 23.

(Source: Internal data)

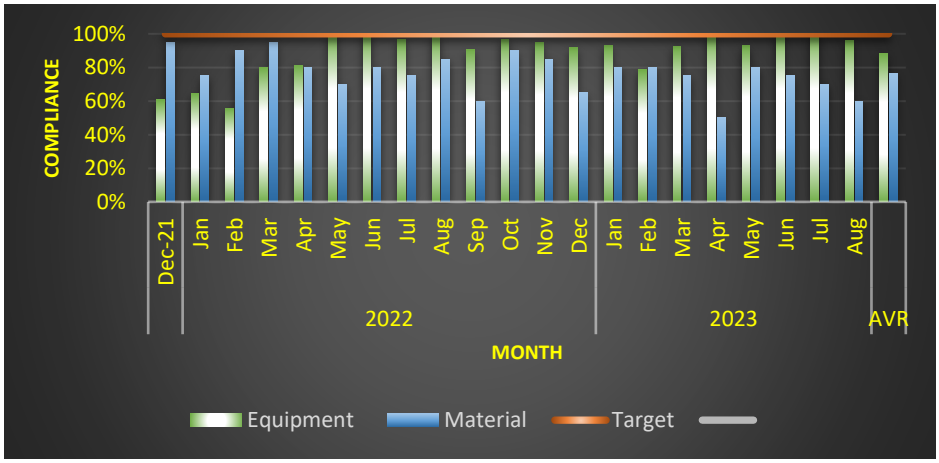


Figure 4. 4 Target vs actual of supply equipment and material from December 2021 to August 2023.

(Source: Internal data)

5. **Financial Factors:** This element is thought to be one of the main causes of PTPB's incapacity to carry out its duties, according to conversations with stakeholders. PTPB's finances are burdened by the contract's long payment term and broad scope of activity, which prevents it from covering the upfront costs of operation. These figures indicate that PTKPC's on-time invoice payment is a major source of cash flow for PTPB. To make matters worse, PTPB's financial plight is further compounded by unanticipated cost adjustments brought on by changes in the market and variations in material costs. in addition to Complicating PTPB's financial situation are the unresolved issues of unpaid salaries to employees and material supply suspensions by some of the suppliers who supply splicing kit supplies as stipulated in the contract. These suppliers cause PTPB's performance in the CTMD by delaying the delivery of items until unpaid payments are cleared. On the PTKPC side, when coal prices are low, invoice payments will be maximized to 90 calendar days to secure PTKPC's cash flow. This condition requires PTPB to be financially capable of covering all operational costs for 3 months.

   The problem tree analysis, as shown in Figure 4.5 demonstrates the intricacy of the reasons why PTPB was unable to complete the tasks specified in the contract. Based on the Cynefin Framework approach, the author can determine that PTPB's performance is classified as "complicated" for decision-making purposes. This is because the problem context has a moderate amount of uncertainty due to its mixed character, involving both known and unknown aspects. In a complex environment, leaders need to perceive, evaluate, and act. A leader should welcome fresh, solution-focused viewpoints from others while also paying attention to stakeholders and experts while addressing these problems.

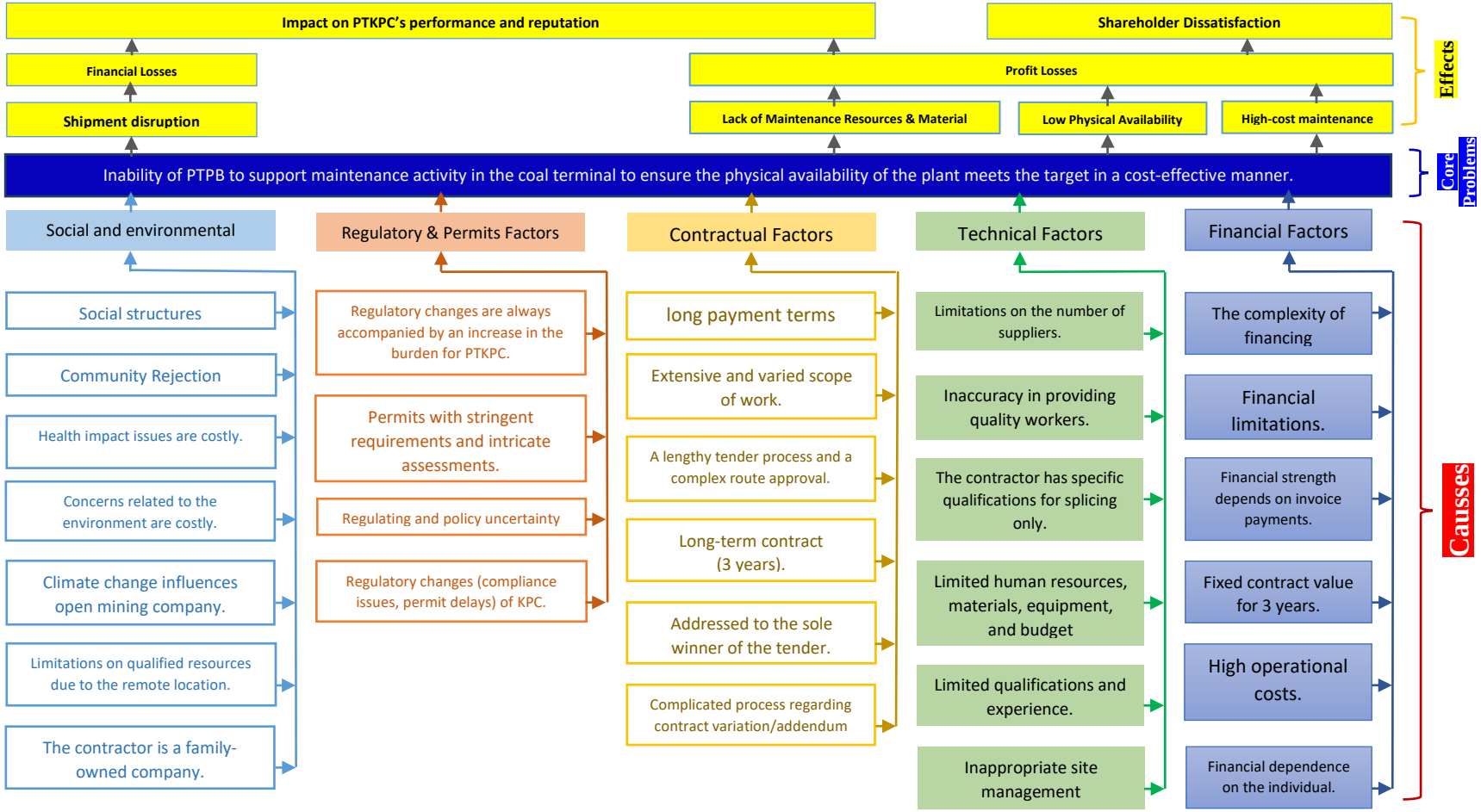


Figure 4. 5 Problem Tree Analysis

(Source: Author)

Stakeholder Analysis

As per the explanation of Problem Identification in Chapter 1, there are seven stakeholders who have an interest in the existence of PTPB in PTKPC operations. These stakeholders are the Coal Terminal Department, Coal Terminal Operation, Coal Quality Control Department, Marketing Department, and Contract Department, Finance Department and PTPB itself. The tender process for a contract at PTKPC usually takes 8–10 months from pre-bid to award and all the stakeholder's role could be seen in the Tabel 1.7 above and for the whole process could be seen in the Figure 4.6 below.

The tender process involves the contract department, with the custodian mainly participating in document review, pre-tender meetings, and technical clarification. Final approval rests with the contract committee, often led by the CEO, and the process may be repeated for cost negotiation.

After understanding the process flow, a list of questions will be compiled to be asked through structured interviews using questionnaires as detailed in Appendix A.1-3 below with all existing stakeholders Through the key persons listed in Table 4.4 above, aiming to assess the power and interest of each stakeholder, as shown in Table 4.5 below.

One of the theoretical methods the researcher employed to determine each stakeholder's location in the power-interest matrix quadrant was stakeholder analysis. Subsequently, the results of these interviews, categorised based on power and interest where each stakeholder's value corresponds to their degree of power (Yi) and interest (Xi). Upon Following the acquisition of these variables, an analysis is performed, beginning with the equation (1) above to determine the average value of the power level ($\bar{Y}$) and interest level ($\bar{X}$). From this average value, the average value of the interest level will be computed ($\bar{\bar{\boldsymbol{x}}}$) and the average value of the power level ($\bar{\bar{\boldsymbol{Y}}}$) using equation (2) above, so that the limiting value in the cartesian diagram will be reached, namely (2.71; 2.25). Stakeholder group mapping was then done on the power-interest matrix, which is shown in Figure 4.8 below.

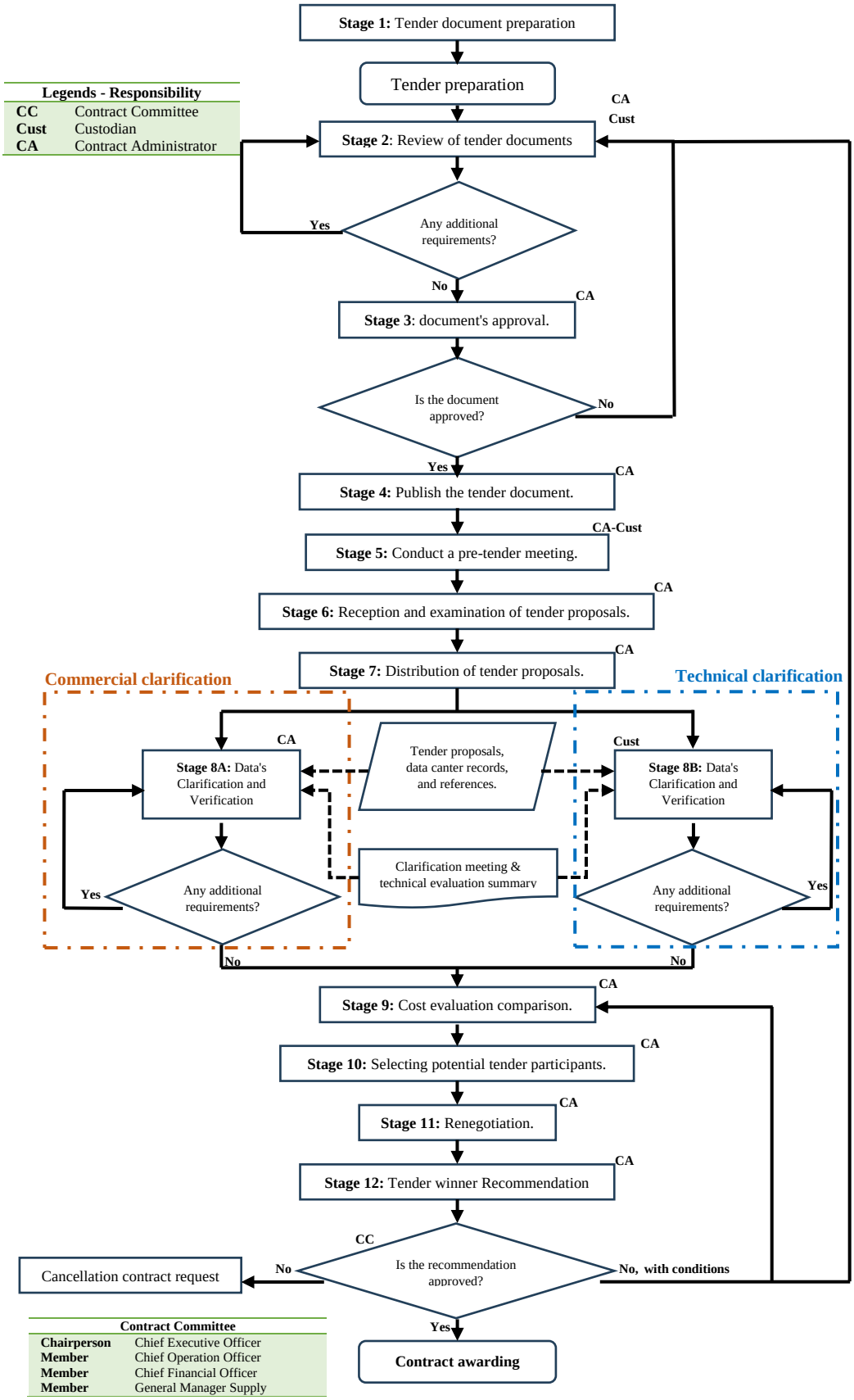


Figure 4. 6 The process flowchart for the tender of contract services at PTKPC

(Source: Internal data)

Table 4. 5 The value of the level of interest and power of the contract PTPB stakeholders

(Source: Author)

Stakeholders	CTM	CTO	CQC	MKT	CONT	FIN	PTPB		CTM	CTO	CQC	MKT	CONT	FIN	PTPB	
	Level of power (Yi)								Level of interest (Xi)							
MYH	4	2	2	2	3	2	3		4	4	2	2	4	3	3	
SR	3	2	2	2	4	1	3		3	3	2	2	3	2	3	
NS	3	2	2	2	3	2	2		3	3	2	1	4	2	3	
BY	3	2	2	2	3	2	2		3	3	3	2	4	3	3	
TH	3	2	2	1	3	2	3		3	4	2	2	4	2	4	
RA	3	2	1	2	4	2	3		3	3	2	2	4	2	3	
MLW	3	2	2	2	3	1	2		3	3	2	1	4	2	3	
RP	3	1	2	2	3	1	2		3	3	2	2	4	1	3	
BS	4	2	2	2	3	2	3		4	3	2	2	4	1	3	
HK	3	2	1	2	3	1	3		3	3	3	2	4	2	3	
ARF	3	2	2	2	4	1	2		3	3	2	1	4	2	3	
YM	3	2	2	2	4	2	2		3	2	2	2	4	2	3	
HRN	3	2	2	1	3	2	3		3	3	2	2	3	2	3	
PD	3	2	2	2	4	1	3		3	3	2	2	4	3	3	
DS	3	2	1	1	3	2	2		3	3	2	2	4	1	3	
WK	3	2	2	2	4	1	2		3	3	3	1	4	2	3	
RR	4	2	2	2	3	2	3		4	3	2	2	4	2	3	
NY	3	2	2	2	3	2	3		3	3	2	2	4	2	3	
HS	3	1	2	2	3	1	3		3	3	2	2	4	2	3	
EF	3	2	2	1	4	2	3		3	3	2	1	4	3	3	
SH	3	2	1	2	4	1	2		3	3	2	2	4	2	3	
CA	3	2	2	2	3	2	2		3	3	3	2	4	1	3	
AJ	3	2	2	2	3	2	3		3	3	2	2	4	2	4	
YK	3	2	2	2	3	2	3		3	3	2	2	4	2	3	
MS	3	2	2	2	3	1	2	$\bar{\bar{Y}}$	3	4	3	2	4	2	3	$\bar{\bar{x}}$
RI	3	1	2	2	4	1	2		3	3	2	2	3	1	3	
Average	**Ȳ 2.93**	**Ȳ 1.83**	**Ȳ 1.72**	**Ȳ 1.67**	**Ȳ 3.48**	**Ȳ 1.52**	**Ȳ 2.61**	**2.25**	**X̄ 3.29**	**X̄ 2.93**	**X̄ 2.39**	**X̄ 1.70**	**X̄ 3.57**	**X̄ 1.94**	**X̄ 3.18**	**2.71**
Category	Key players	Keep Satisfied	Minimal Effort	Minimal Effort	Key players	Minimal Effort	Key players		Key players	Keep Satisfied	Minimal Effort	Minimal Effort	Key players	Minimal Effort	Key players	

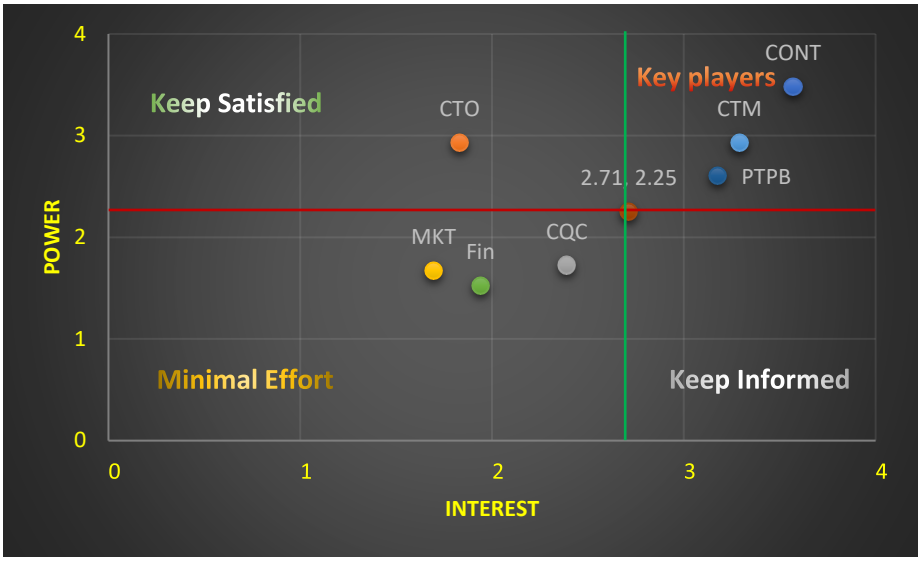


Figure 4. 7 Power-Interest Matrix of the Contract PTPB Stakeholders

(Source: Author)

The power-interest matrix map indicates that no stakeholders are located in the Keep Informed quadrant, while three stakeholders are found in the Key Players category, one in the Keep Satisfied category, and three in the Minimum Effort area. Stakeholder satisfaction can be met when the contract is operating well and there is no problem with plant physical availability, which will prevent shipment disruptions in an efficient and cost-maintaining manner. This is because, according to the outcomes of the focused discussion, the seven stakeholders are directly related to this case study.

Drawing from the power-interest matrix map presented above and taking into account stakeholders with significant power and interest to foresee potential issues during work implementation (Bryson 2004), the author will provide a summary of the expectations of Contract PTPB Stakeholders who are into the Key Players and Keep Satisfied categories. That amounts to four group stakeholders. The author has categorised these stakeholders' expectations based on important respondents who are also stakeholders throughout the interview stage as shown in the Table 4.6 below.

Table 4. 6 Four stakeholders wish for high power and interest.

(Source: Author)

No	Stakeholder	Expectations of the Contract PTPB
1	CONT	Not appointing only one contractor for a large scope of work is essential so that if obstacles arise, the impact will not be immediately significant. Additionally, having more than one contractor for a particular job fosters positive competition among the contractors in providing their services to PTKPC and also reviews the length of the contract duration for a sole appointment. However, these aspects require support and endorsement from top management or the Board of Directors.
2	CTMD	Not assigning a large scope of work to a single contractor, assessing the financial capabilities of the contractor before awarding a job, ensuring that the contractor's invoice payments are not delayed beyond 60 days, and having the contract department verify that contract rates comply with government's regulations.
3	PTPB	Ensure timely payment of invoices within the agreed 60-day period, provide overtime allowances to PTPB employees, and adjust contract values in accordance with legal standards and government's regulations.
4	CTOD	There are no issues with the physical availability of the plant; maintenance tasks are proceeding according to plan, and there are no prolonged shutdowns, reducing plant breakdowns and unscheduled maintenance due to unavailable resources

Value-Focused Thinking (VFT)

One of the theoretical which is from Keeney (1992) established the notion of Value-Focused Thinking (VFT), a decision-framework that emphasises values as a means of evaluation and as a means of reflecting the goals of the decision-makers. There are two different kinds of objectives: mean objectives, which are a means to an end, and fundamental objectives, which are a primary reason to be interested in the choice scenario. The collection of objectives for which criteria should be defined can be suggested by the hierarchy of fundamental objectives (Vivas and Oliveira, 2017). The purpose of VFT is to focus the decision-maker's attention on the crucial tasks that come before solving a decision problem.

There are mean and fundamental goals that are motivated by values. The mean-end objectives hierarchy tool can assist in identifying the primary goals of this study based on the outcomes of interviews regarding the expectations of stakeholders within Contract PTPB Stakeholders, as indicated in Table 4.6 above.

According to Figure 4.8, " Determining the fixed plant contract's maintenance strategy at the coal terminal to support shipping activities " is

one of the top-level core objectives. At the second level, there are five mean objectives for optimising fixed plant maintenance according to stakeholder expectations. To make decisions using the AHP approach, the five mean objectives are: Optimization of the contract's value; Optimization of the cost-effectiveness contract; Optimization of the work quality; Optimization of the contract duration; and Optimization of contract management and control transposed into design criteria. Table 4.7 provides an overview of the definitions of the five criteria.

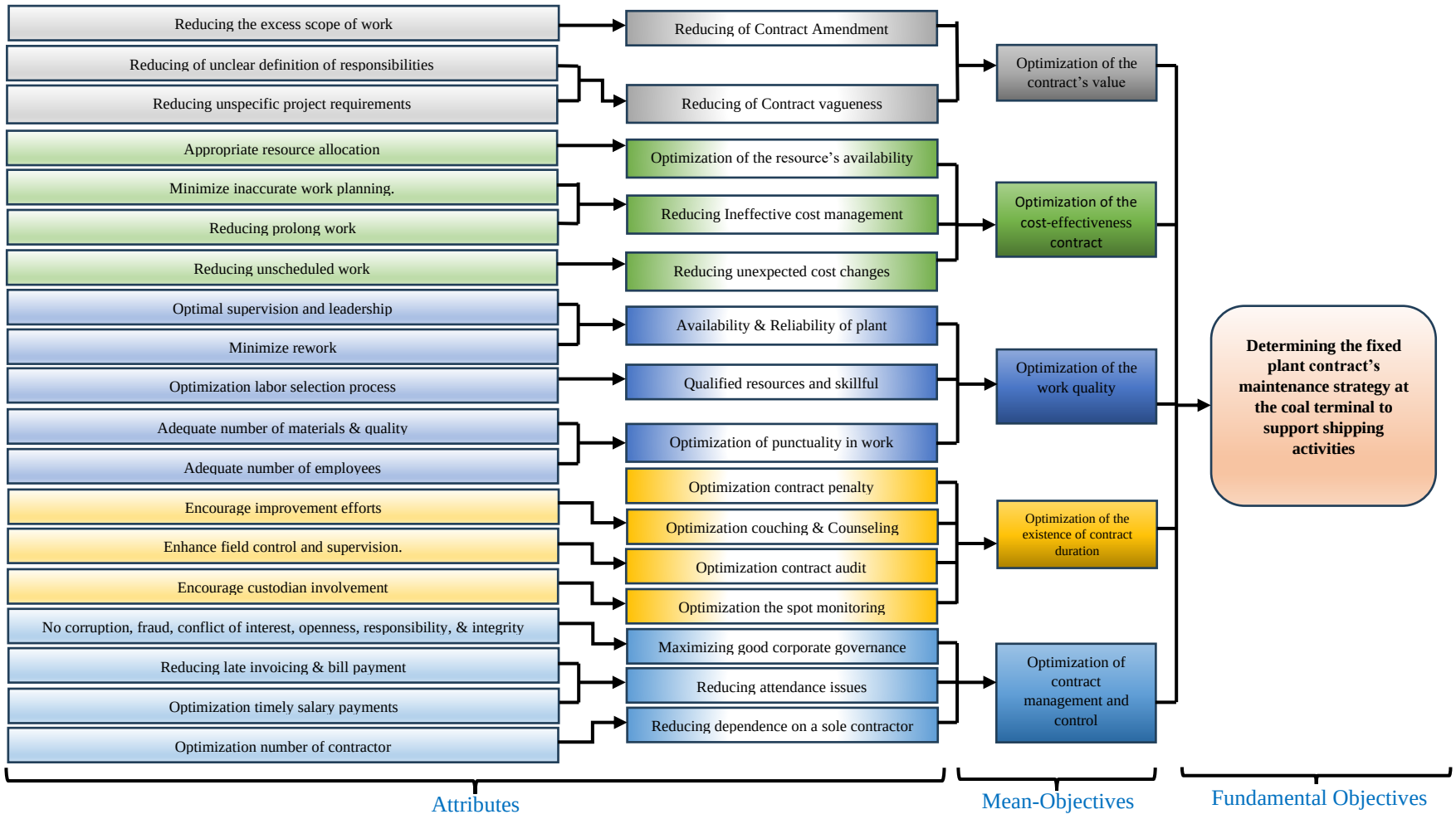


Figure 4. 8 Hierarchy of Fundamental Objectives

(Source: Author)

Table 4. 7 Mean objectives (VFT) to criteria design (AHP) conversion table.

(Source: Author)

Mean Objectives (VFT)	Criteria (AHP)	Description
Optimization of the contract's value	Cost	Refers to the PTPB contract, The contract value includes a wide range of tasks such as labor supply, material supply, fabrication work, and the provision of support equipment & vehicles. Previously, the contractor focused on conveyor splicing maintenance. With the addition of fabrication work, material supply, and procurement of support equipment, the contractor becomes unfocused and finds it difficult to meet the contract's scope of work. Allocating available resources to tasks according to their qualifications will eliminate rework and additional losses.
Optimization of the cost-effectiveness contract	Cost	Refers to the contract and work plan CTMD, Prolonged work, unscheduled work, and insufficient work will result in the work plan not being performed due to tight available resources, which will inflict additional labor. Implementing penalties for every non-compliance by PTPB will help cover additional costs.
Optimization of the work quality	Quality	Referring to the contract and work plan CTMD, each work has standards that need to be achieved in performing the contract, such as work duration, mean time to repair (MTTR), and Mean time between failures (MTBF), including safety factors that will influence the availability and reliability of the plant. Any incapacity of PTPB will be covered with additional resources through direct orders using CTMD's Operational Expenditure (OPEX)
Optimization of the existence of contract duration	Time	Referring to the contract document that contract will valid 36 months or 3 years that means within 3 years the sole contractor will take the responsibility in conveyor maintenance in Coal Terminal besides the complicated and time-consuming in creating new contracts/addendums when the availability of fixed plant must be maintained to support PTKP shipment.
Maximizing the project's contract management and control	Contract Management	The contractual component consists of contracts and agreements for conveyor maintenance in the coal terminal between PTPB and CTMD acting on behalf of PTKPC. This part governs the contract's rights, duties, and liabilities as well as change management, dispute resolution, and commercial needs and any changes to the contract must receive approval from the contract committee and involve a lengthy process.

Generate Alternatives

The VFT in Figure 4.9 was designed to assist the decision-maker in focusing on the fundamental and means activities before attempting to solve a decision problem. The values-driven approach is usually used to generate

meaningful alternatives to achieve the values after problems are identified and the values (criteria) to be considered in the evaluation are decided.

Certainly! Based on the interview results and focus group discussions (transcript of the interview is attached in Appendix A.4-8) with key person (KP) stakeholders, questions were asked regarding the root cause of the contractor's inability and the relevant available scenarios to solve the problem. It was found that there are four alternatives could be implemented, namely:

1. Direct contract termination
2. Contract addendum
3. Counselling & coaching
4. Implementation of warning and penalties

Based on the findings of the FGD and interviews, the process of creating alternatives to the fundamental objectives hierarchy (VFT) is outlined in Network Figure 4.9 below.

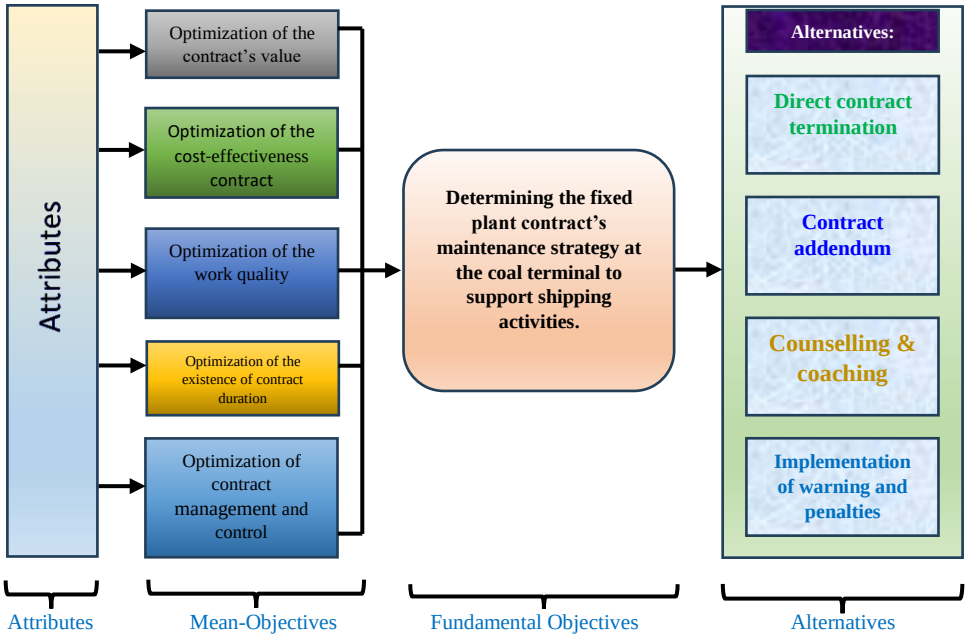


Figure 4. 9 VFT process for developing alternative with a fundamental

(Source: Author)

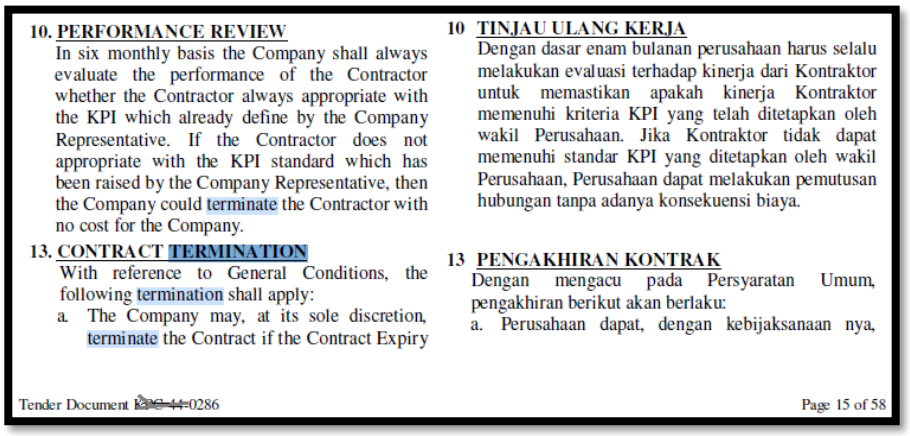
The advantages and disadvantages of the four options for resolving the current problem have been compiled by the author through the analysis process in Table 4.8. The best option is chosen based on the advantages and disadvantages of each option as determined by key person interviews and focus group discussions (transcript of interview results in Appendix A.4-8).

Table 4. 8 Pros-Cons analysis of alternative

(Source: Author)

No.	Alternative	Pros	Cons
1.	Direct contract termination	• It will demonstrate PT KPC's firmness. • The clause related termination- in the PTPB contract can be seen in Figure 4.10.	• Only 2 contractors have the qualifications for conveyor maintenance in Sangatta, namely PTCMP and PTPB. • The process of creating a new contract takes 6-8 months and is no guarantee that it will be approved by committee. • Operational needs fixed plant in the coal terminal must not be disrupted. • Can not stop or mitigate PTKPC's losses directly because the replacement process and contractor cannot be guaranteed. • Need capital equivalent to the existing contract, or even larger, due to the previous contract being a package deal involving several jobs.
2.	Contract addendum	• Can improve the PTPB performance by readjusting current contract rate to align with market prices. • Fixed Plant maintenance process continue as it has been. • The costs incurred are not as significant as the contract value, only	• Process takes 6-8 months because it is like creating a new contract, including review and approval by the contract committee. • There is no guarantee that it will be approved by the

No.	Alternative	Pros	Cons
		in specific areas where PTPB is unable to fulfil, namely fabrication & liner maintenance, with a weight of 13.4% of the contract value as per Table 4.2 above.	committee considering company conditions.
3.	Counselling & coaching	• In the long term, it will enhance PTPB's capabilities beside conveyor belt work. • Does not require committee approval. • Can be directly handled by the custodian and contract department. • Fixed Plant maintenance process continue as it has been. • The costs incurred are not as large as the contract value, only 11% According to table 1.6, the average gap in contract compliance.	• Extra cost will apply to cover PTPB's shortcomings. • short or long-term success is uncertain. • creating an impression of weakness of PTKPC. • Can not stop or mitigate PTKPC's losses directly because the replacement process and contractor cannot be guaranteed.
4.	Implementation of warning and penalties	• Can be implemented directly and already done. • Demonstrating the firmness of PTKPC. • easy implementation, can be directly deducted from the invoice. • The costs incurred are not as large as the contract value, only 11% According to table 1.6, the average gap in contract compliance but, we will receive PTPB penalty payments which can help cover the additional cost incurred.	• Extra cost will apply to cover PTPB's shortcomings. • short or long-term success is uncertain. • Aggravate PTPB's financial condition.



10. PERFORMANCE REVIEW

In six monthly basis the Company shall always evaluate the performance of the Contractor whether the Contractor always appropriate with the KPI which already define by the Company Representative. If the Contractor does not appropriate with the KPI standard which has been raised by the Company Representative, then the Company could terminate the Contractor with no cost for the Company.

13. CONTRACT TERMINATION

With reference to General Conditions, the following termination shall apply:

a. The Company may, at its sole discretion, terminate the Contract if the Contract Expiry

10 TINJAU ULANG KERJA

Dengan dasar enam bulanan perusahaan harus selalu melakukan evaluasi terhadap kinerja dari Kontraktor untuk memastikan apakah kinerja Kontraktor memenuhi kriteria KPI yang telah ditetapkan oleh wakil Perusahaan. Jika Kontraktor tidak dapat memenuhi standar KPI yang ditetapkan oleh wakil Perusahaan, Perusahaan dapat melakukan pemutusan hubungan tanpa adanya konsekuensi biaya.

13 PENGAKHIRAN KONTRAK

Dengan mengacu pada Persyaratan Umum, pengakhiran berikut akan berlaku:

a. Perusahaan dapat, dengan kebijaksanaan nya,

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Figure 4. 10 The clause related termination- in the PTPB contract

(Source: Internal data)

Conclusion of Business Analysis

Based on the findings of the business problem exploration in the PTPB contract, it is evident that the extensive scope of work assigned during the transition period of the PTKPC contract from PKB2B to IUPK has led to PTPB's inability to fulfil its duties. This is primarily due to PTPB being tasked with new responsibilities outside its specialization. Additionally, the lengthy 3-year contract duration requires substantial capital to execute tasks, including hiring additional staff according to the expanded scope of work, investing in the procurement of equipment and splicing kit materials, and dealing with occasional delayed payments from PTKPC.

The identified issues, analysed through the problem tree analysis method and gap analysis, indicate that the current situation has affected the availability of resources and maintenance materials, leading to unmet physical plant availability and increased maintenance costs. This, in turn, impacts PTKPC's sales, revenue, and reputation.

To address the current situation, an analysis of several alternatives is needed to align with stakeholder expectations. The alternatives include:

1. Direct contract termination
2. Contract addendum

3. Counselling & coaching
4. Implementation of warning and penalties

From the analysis results, several criteria for decision-making processes related to the four alternatives were identified. These criteria include:

1. Cost
2. Quality
3. Time
4. Contract Management

IV.2 Business Solution

This final project focuses on decision analysis to choose the best alternative for resolving the inconsistency issues faced by PTPB in implementing the agreed-upon contract in line with stakeholder expectations. Based on interviews and focus group discussions (FGD) with key stakeholders and the analysis presented earlier in the business analysis sub-chapter, there are four alternative transmission channel designs, namely:

1. Direct contract termination
2. Contract addendum
3. Counselling & coaching
4. Implementation of warning and penalties

Respondents Profile

The Analytic Hierarchy Process (AHP) technique is employed to select the best alternative from those generated during the ideation phase. Pairwise comparisons are a crucial step in the AHP procedure. To establish pairwise comparisons, a survey is conducted to determine the relative significance of one element compared to another. Key person stakeholders can be

interviewed during the prioritization process to provide assessments in decision-making. The AHP method is utilized to choose the best solution alternative by involving multiple key persons as decision-makers (see Table 4.9) at PTKPC (leaders with decision-making authority).

Table 4. 9 List of Key persons of decision-making in determining contracts of PTPB.

(Source: Author)

No.	Key Person	Department	Job Description
1.	Manager Maintenance	CTMD	The highest-ranking leader and decision-maker in the Coal Terminal Maintenance department.
2.	Maintenance Planning Superintendent	CTMD	Determining the planning and scope of work for the CHMD Such a work plan would include activities related to material replacement, procurement processes, and cost control measures.
3.	Mechanical Superintendent	CTMD	responsible for executing the work, overseeing all resources within the CTMD and participating in the verification of contractor's invoices.
4.	Contract Superintendent	Contract Department	Conducting tender processes, verifying tender participants, analyzing submissions, and engaging in price negotiations while directly overseeing responsibilities related to the contract committee.
5.	Senior Contract specialist	Contract Department	Conducting tenders, verifying tender participants, analyzing submissions, negotiating prices, and periodically monitoring the contractor's performance together with custodian.

Modelling of Analytic Hierarchy Process

1. Construct structure a hierarchy

   The objective of this analysis is to select the best alternative to address the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal. The context for selecting these alternatives is to eliminate resource and material shortages in conveyor maintenance, allowing the physical availability of the plant to be achieved in a cost-effective manner within the budget. The inability to rectify this condition would disrupt shipping activities and PTKPC sales, ultimately failing to meet stakeholder expectations. Based on the

analysis results in the above section, four alternatives are proposed. Additionally, there are four criteria synthesizing stakeholder analysis results related to various expected values in the contract. These criteria will serve as a guide in the decision-making process regarding the four alternatives. The method used to aid decision-making is by employing the Analytic Hierarchy Process (AHP), with the analytical process supported by AHP Super Decision software. The Hierarchy Structure of the AHP Model is illustrated in Figure 4.11 below.

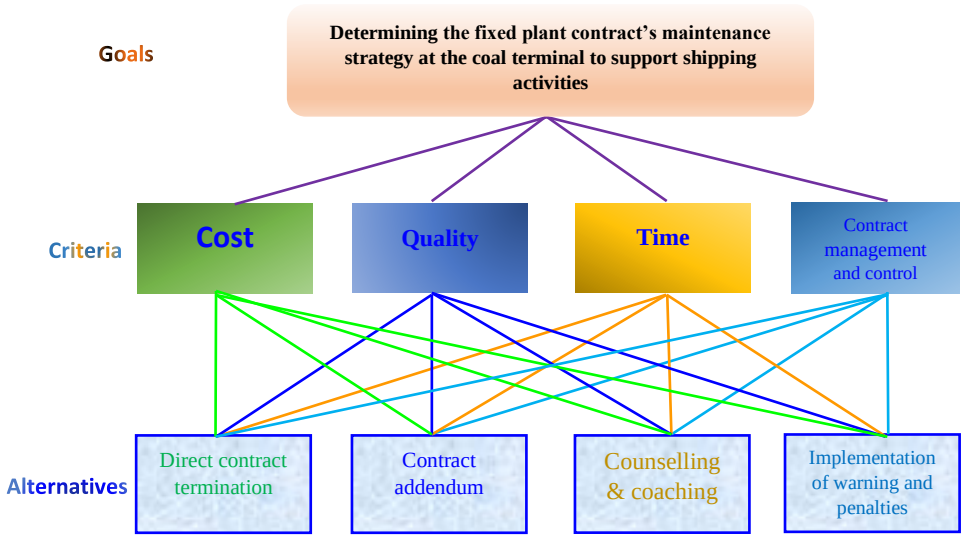


Figure 4. 11 The structure a Hierarchy of AHP Model

(Source: Author)

2. Pairwise Comparison of AHP-Model

The criteria and sub-criteria described above have been compared pairwise, and the results have been translated into a questionnaire that the chosen respondents must fill out with their scores for every comparison table. An example of how a key person can describe the intensities of judgements using a paired numerical rating, or a fundamental scale of value, is shown in Table 4.10. The next stage is to use the questionnaires in Tables 4.11 and 4.12 to conduct interviews

with five key individuals to obtain pairwise comparisons of the criteria and potential solutions.

Table 4. 10 Pairwise numerical rating

(Source: T.L Saaty, 1970)

Intensity of Importance	Definition	Explanation
1	Equal Importance	Two activities contribute equally to the objective
3	Moderate Importance	Experience and judgment slightly favour one activity over another
5	Essential Importance	Experience and judgment strongly favour one activity over another
7	Very Strong Importance	An activity is favoured very strongly over another; its dominance demonstrated in practice
9	Extreme Importance	The evidence favouring one activity over another is of the highest possible order of affirmation
2, 4, 6, 8	Intermediate Values	When compromise is needed between two

Table 4. 11 Pairwise questionnaire of criteria

(Source: Author)

Question :
Which one of the following **criteria** do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Cost	←	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	→	Quality
Cost	←	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	→	Time
Cost	←	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	→	Contract management
Quality	←	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	→	Time
Quality	←	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	→	Contract Management
Time	←	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	→	Contract Management

Table 4. 12 Pairwise questionnaire of alternative solutions

(Source: Author)

Question :
Based on the criteria "**cost, quality, time, contract management**," which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	→	Implementation of warning and penalties

The results of interviews with five key persons (KP) who play a role in decision-making related to the PTPB contract in CTMD, point values for paired comparisons of criteria and alternative solutions were obtained from each key person. The results of pairwise comparisons from interviews with key persons can be seen in appendix B.1 of this final project. For further calculations in this final project, we will use the geometric mean as indicated in Equation 3 above, based on the pairwise comparisons from all key persons. The calculation results are presented in Table 4.13 for Pairwise Criteria Comparison and Table 4.14 for Pairwise Alternative Comparison.

Table 4. 13 Pairwise Comparison of Criteria

(Source: Author)

No.	Criteria	Respondent					Geometric Mean
		KP1	KP2	KP3	KP4	KP5	
1	Cost-Quality	0.33	1.00	0.33	3.00	4.00	1.06
2	Cost-Time	0.50	2.00	0.33	4.00	3.00	1.32
3	Cost-Contract management	2.00	2.00	2.00	1.00	1.00	1.52
4	Quality-Time	0.50	2.00	2.00	1.00	1.00	1.15
5	Quality-Contract management	2.00	2.00	3.00	0.33	0.33	1.06
6	Time-Contract management	3.00	1.00	4.00	0.33	0.33	1.06

Table 4. 14 Pairwise Comparison of Alternative

(Source: Author)

Criteria	Alternative	Respondent					Geometric Mean
		KP1	KP2	KP3	KP4	KP5	
Cost	Direct contract termination-Contract addendum	1.00	0.50	1.00	1.00	1.00	0.87
	Direct contract termination-Counselling & coaching	0.50	0.33	0.50	0.50	0.50	0.46
	Direct contract termination-Implementation of warning and penalties	0.33	0.25	0.50	0.50	0.50	0.40
	Contract addendum-Counselling & coaching	0.50	0.33	1.00	0.50	0.50	0.53
	Contract addendum-Implementation of warning and penalties	0.33	0.25	0.50	0.50	0.33	0.37
	Counselling & coaching-Implementation of warning and penalties	0.50	0.50	0.25	1.00	0.25	0.44
Quality	Direct contract termination-Contract addendum	1.00	1.00	1.00	1.00	1.00	1.00
	Direct contract termination-Counselling & coaching	1.00	0.50	0.50	0.50	0.50	0.57
	Direct contract termination-Implementation of warning and penalties	0.50	0.33	0.33	0.33	0.33	0.36
	Contract addendum-Counselling & coaching	1.00	0.50	1.00	0.50	0.50	0.66
	Contract addendum-Implementation of warning and penalties	0.50	0.25	0.33	0.33	0.33	0.34
	Counselling & coaching-Implementation of warning and penalties	0.33	0.33	0.50	0.50	0.25	0.37
Time	Direct contract termination-Contract addendum	1.00	1.00	1.00	1.00	1.00	1.00
	Direct contract termination-Counselling & coaching	0.50	0.50	0.33	0.33	0.33	0.39
	Direct contract termination-Implementation of warning and penalties	0.33	0.33	0.25	0.25	0.33	0.30
	Contract addendum-Counselling & coaching	0.50	0.50	0.33	0.25	0.33	0.37
	Contract addendum-Implementation of warning and penalties	0.33	0.25	0.25	0.25	0.33	0.28
	Counselling & coaching-Implementation of warning and penalties	0.50	0.33	1.00	0.50	1.00	0.61
Contract management	Direct contract termination-Contract addendum	1.00	1.00	1.00	1.00	1.00	1.00
	Direct contract termination-Counselling & coaching	0.50	0.50	0.50	0.50	1.00	0.57
	Direct contract termination-Implementation of warning and penalties	0.33	0.50	0.33	0.50	0.50	0.43
	Contract addendum-Counselling & coaching	0.50	0.50	0.50	0.50	1.00	0.57
	Contract addendum-Implementation of warning and penalties	0.33	0.33	0.33	0.50	0.50	0.39
	Counselling & coaching-Implementation of warning and penalties	0.50	0.50	0.50	1.00	0.33	0.53

3. Synthesize the results to determine the best alternative solution.

Synthesize the results to determine the best alternative solution. From the paired comparison results, both at the criteria and alternative levels in Tables 4.13 and 4.14 above, the next step is to synthesize the calculations with the assistance of Super Decision AHP software. Before using the software, it is necessary to prepare the paired comparison matrices at both the criteria and alternative levels, as shown in Tables 4.15 and 4.16 below, as input data for the Super Decision AHP software.

Table 4. 15 Pairwise comparison matrix of criteria

(Source: Author)

Criteria	Cost	Quality	Time	Contract Management
Cost	**1.00**	**1.06**	**1.32**	**1.52**
Quality	**0.94**	**1.00**	**1.15**	**1.06**
Time	**0.76**	**0.87**	**1.00**	**1.06**
Contract Management	**0.66**	**0.94**	**0.94**	**1.00**

Table 4. 16 Pairwise comparison matrix of alternatives

(Source: Author)

Criteria	Alternative	Direct contract termination	Contract addendum	Counselling & coaching	Implementation of warning and penalties
Cost	Direct contract termination	1.00	0.87	0.46	0.40
	Contract addendum	1.15	1.00	0.53	0.37
	Counselling & coaching	2.17	1.89	1.00	0.44
	Implementation of warning and penalties	2.49	2.70	2.30	1.00
Criteria	**Alternative**	**Direct contract termination**	**Contract addendum**	**Counselling & coaching**	**Implementation of warning and penalties**
Quality	Direct contract termination	1.00	1.00	0.57	0.36
	Contract addendum	1.00	1.00	0.66	0.34
	Counselling & coaching	1.74	1.52	1.00	0.37
	Implementation of warning and penalties	2.77	2.93	2.70	1.00
Criteria	**Alternative**	**Direct contract termination**	**Contract addendum**	**Counselling & coaching**	**Implementation of warning and penalties**
Time	Direct contract termination	1.00	1.00	0.39	0.30
	Contract addendum	1.00	1.00	0.37	0.28
	Counselling & coaching	2.55	2.70	1.00	0.61
	Implementation of warning and penalties	3.37	3.57	1.64	1.00
Criteria	**Alternative**	**Direct contract termination**	**Contract addendum**	**Counselling & coaching**	**Implementation of warning and penalties**
Contract management	Direct contract termination	1.00	1.00	0.57	0.43
	Contract addendum	1.00	1.00	0.57	0.39
	Counselling & coaching	1.74	1.74	1.00	0.53
	Implementation of warning and penalties	2.35	2.55	1.89	1.00

4. Development of priority ranking

The calculation process of the gathered data is analysed with the assistance of Super Decision AHP software, resulting in prioritized rankings at both the criteria and alternative levels, as presented in Figures 4.12 and 4.13. Appendix C of this final project shows the steps involved in entering data into the AHP Super Decision.

Main Network: Determining the fixed plant contract's maintenance strategy at the coal terminal AHP.sdmod: ratings: Unweighted Super Matrix

Clusters	Nodes	Determining t...	1Cost	2Quality	3Time	4Contract ...
1Goal	Determining the fixed plant contract's maintenance strategy	0.000000	0.000000	0.000000	0.000000	0.000000
2Criteria	1Cost	0.299601	0.000000	0.000000	0.000000	0.000000
	2Quality	0.257004	0.000000	0.000000	0.000000	0.000000
	3Time	0.226279	0.000000	0.000000	0.000000	0.000000
	4Contract management and control	0.217116	0.000000	0.000000	0.000000	0.000000
3Alternatives	1Direct contract termination	0.000000	0.141458	0.148528	0.124638	0.161526
	2Contract addendum	0.000000	0.152787	0.151070	0.120871	0.157325
	3Counselling & coaching	0.000000	0.260020	0.220416	0.305939	0.259816
	4Implementation of warning and penalties	0.000000	0.445735	0.479986	0.448552	0.421333

Figure 4. 12 Data capture from Super Decision AHP software related to priority ranking.

(Source: Super Decision AHP)

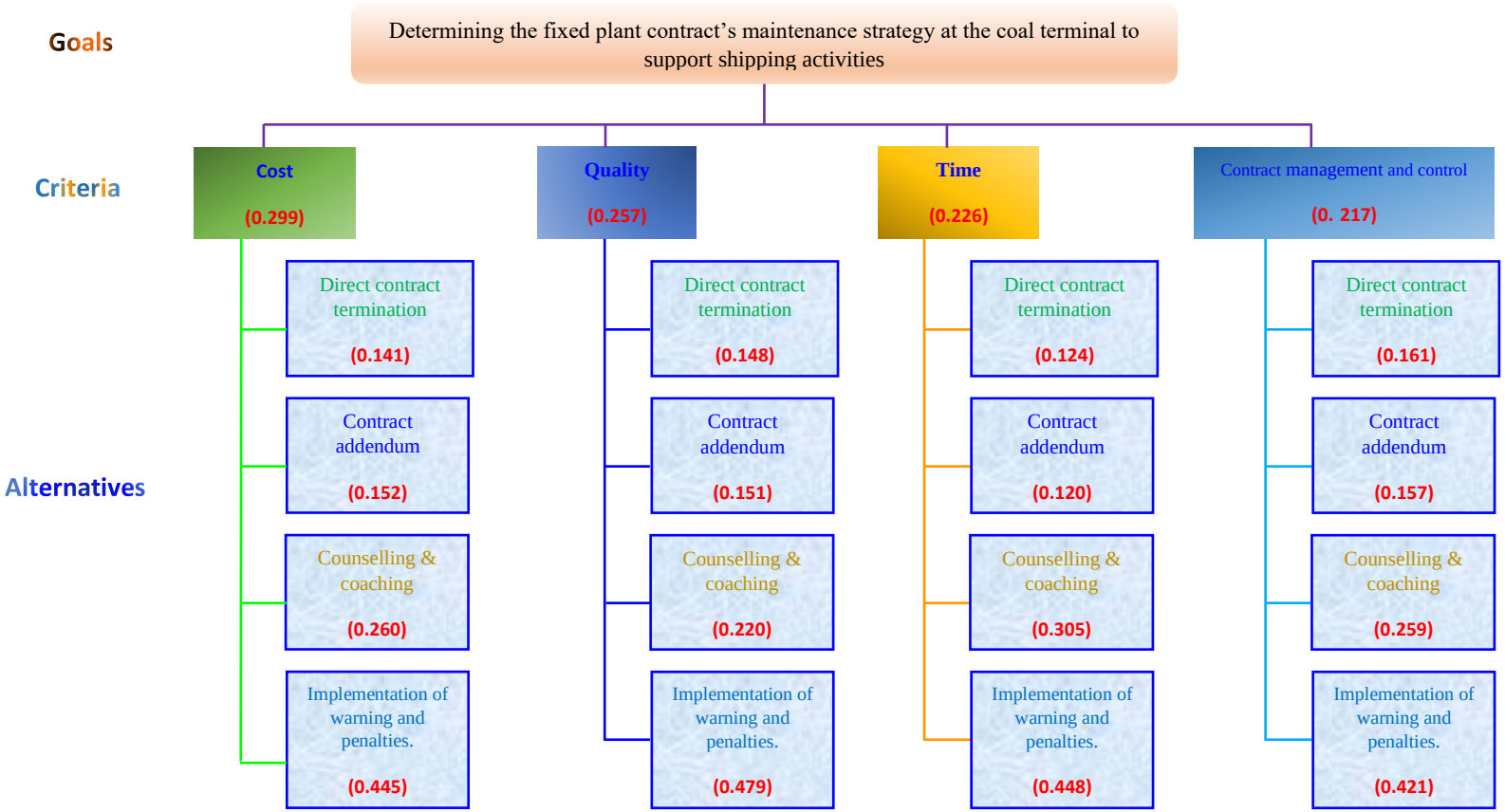


Figure 4. 13 The weight of all criteria and alternatives

(Source: Super Decision AHP)

5. Consistency ratio.

The consistency of decision-makers' assessments during a series of pairwise comparisons is a crucial factor in determining the quality of the final decision. The next stage in the AHP methodology is to calculate the consistency ratio, which measures the degree of agreement between the pairwise assessments provided by decision-makers (key persons). The calculation of the consistency ratio has also been performed with the assistance of Super Decision AHP software (the results of Super Decision AHP calculations can be seen in Appendix C. No.10), with good results at both the criteria and alternative levels, indicating consistency ratios below 0.1 (see Table 4.17). This means that the pairwise comparisons provided by the respondents are consistent (acceptable).

Table 4. 17 Summary result of consistency ratio calculation

(Source: Super Decision AHP)

Item	Consistency Ratio (CR) by Super Decision	Standard CR<0.1	Result
Pairwise comparison level 1	0.00291	CR<0,1	Acceptable
Pairwise comparison level 2:			
Cost	0.01708	CR<0,1	Acceptable
Quality	0.00988	CR<0,1	Acceptable
Time	0.00253	CR<0,1	Acceptable
Contract management	0.00468	CR<0,1	Acceptable

6. Conclusion.

The selection of the best alternative in addressing PTPB's inability to perform its duties related to conveyor maintenance at the Coal Terminal using the Analytic Hierarchy Process (AHP) with the assistance of Super Decision AHP software. From the analysis results depicted through the

weighted hierarchy tree in Figure 4.13, the criteria for prioritization ranking are as follows:

1. Cost = 29.96%
2. Quality = 25.7%
3. Time = 22.63%
4. Contract Management = 21.71%

Cost received the highest score, considering the results of discussions and Focus Group Discussions (FGD) with key persons related to the PTPB contract. This is due to the significant value and scope of the current contract, which must be maximized to ensure there is no disruption to the maintenance of the fixed plant at the coal terminal. The Quality criterion also received a high score because, despite PTPB's current situation, PTKPC's operational activities continue normally, and maintaining high-quality plant availability becomes a serious concern. The last two criteria are related to time and contract management, both of which are challenging to change as they require Board of Directors' approval and involve a lengthy process. Based on the analysis and calculations using Super Decision AHP, the synthesized results of pairwise comparisons are as follows:

1. Implementation of warning and penalties = 44.98%
2. Counselling & coaching = 26.02%
3. Contract addendum = 14.61%
4. Direct contract termination = 14.38%

From the above results, it can be concluded that the Implementation of warning and penalties received the highest score and is the best choice for addressing PTPB's inability to fulfil its current contract obligations, aiming to ensure there is no disruption to the maintenance of the fixed plant at the coal terminal as shown in Figure 4.14.

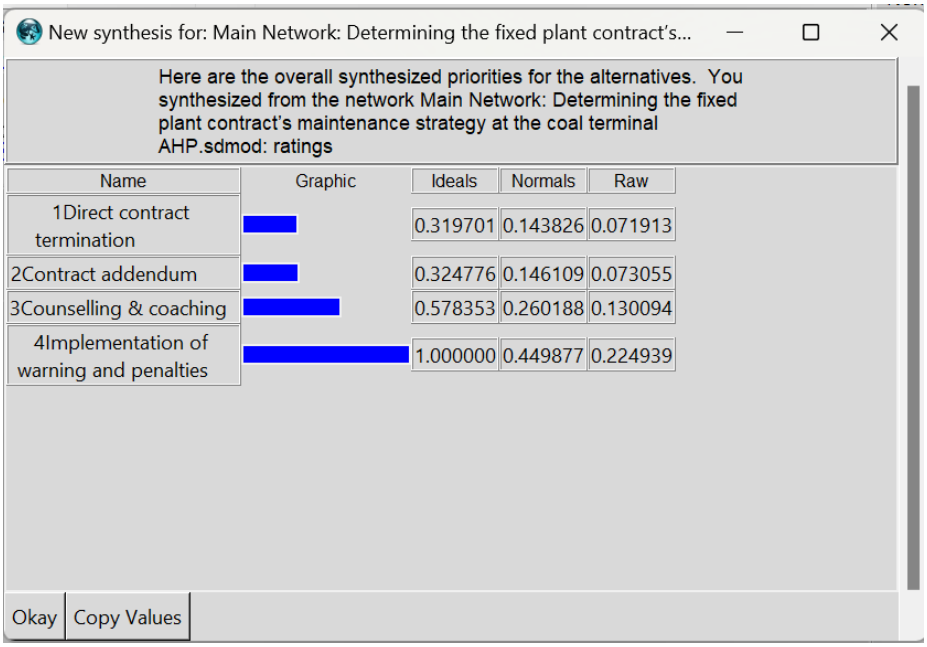


Figure 4. 14 Data capture from Super Decision AHP software related alternatives synthesized priorities.

(Source: Super Decision AHP)

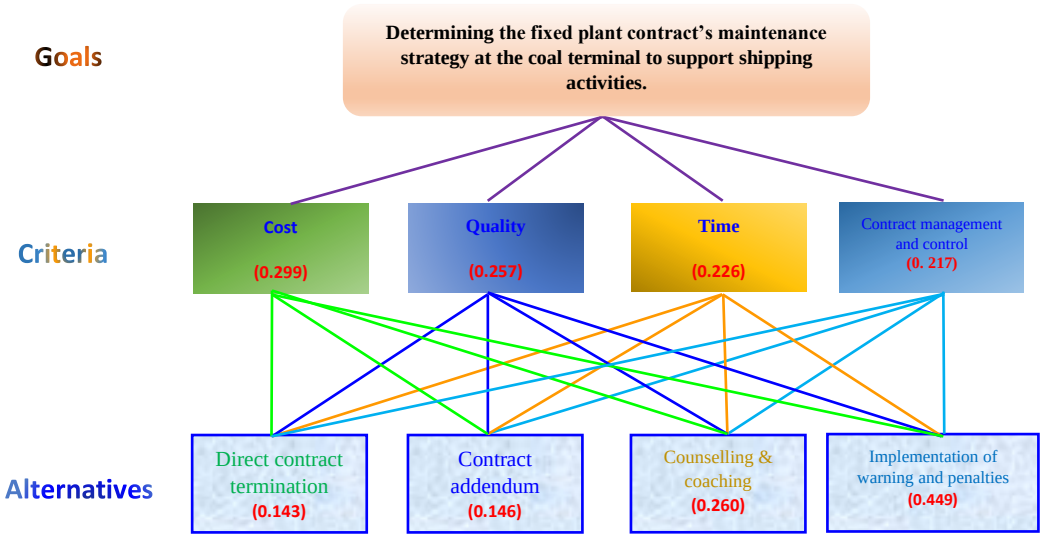


Figure 4. 15 The structure a Hierarchy of AHP Model

(Source: Decision AHP)

IV.3 Implementation Plan & Justification

In this final project, the researcher proposes alternatives to address issues related to PTPB's inability to fulfil the contract using the 5W + 1H method (What, When, Where, Who, Why, and How).

What

The In response to the current condition regarding PTPB's inability to perform its duties in conveyor maintenance, it is proposed to implement warnings and penalties, as discussed in the previous chapter. This proposal is based on various analytical approaches such as internal and external analysis, problem tree analysis, stakeholder analysis, Value-Focused Thinking (VFT), and Analytic Hierarchy Process (AHP). Implementation of warnings and penalties is the gradual issuance of warnings followed by penalty payments for each instance of PTPB's inability to fulfil tasks and obligations according to the contractual clauses mutually agreed. Detailed clauses can be found in Figure 4.16 below.

7. KEY PERFORMANCE INDICATOR **7. INDIKATOR KERJA UTAMA**

No. *No.*	Category *Kategori*	Standard *Standar*	Penalty or Remedy *Denda atau Upaya Perbaikan*
7.1	Execution of Works	The Contractor shall execute the Works on the Date or time as required	a. For non compliance, the Company will issue a First Warning Letter
7.2	CMS compliance *Kepatuhan CMS* *Bobot/ Weight : 5%*	The Contractor shall comply with the Company CMS System and minimum audit score as set by the Company *Kontraktor harus mematuhi Sistem CMS Perusahaan dan angka audit minimal sebagaimana yang ditetapkan oleh Perusahaan*	a. The penalty shall refer to CMS audit result by the Company. *Denda akan merujuk pada hasil audit CMS oleh Perusahaan.* b. Delay in commencing the Works on Commencement Date due to CMS non compliance shall refer to Penalty in Category 3.1 of the KPI. *Keterlambatan memulai Pekerjaan pada Tanggal Mulai karena tidak dipatuhinya CMS akan merujuk pada Denda dalam Kategori 3.1 KPI.* c. Delay in commencing or finishing each Service due to CMS non compliance shall refer to Penalty in Category 3.1 of the KPI.
			pungutan biaya apapun. Jika tidak Perusahaan akan menggunakan Kontraktor lain atas tanggungan Konraktor. iv) If the non compliance continues, Penalty in Category 3.1 of the KPI shall apply. *Jika ketidakpatuhan berlanjut, Denda dalam Kategori 3.1 KPI akan berlaku.*

Figure 4. 16 Clause implementation of penalties in PTPB contract

(Source: Internal data)

Why

Several considerations for why the Implementation of Warnings and Penalties can be applied in addressing this issue are as follows:

(1) Timing: Can be implemented directly and already undertaken.
(2) Demonstrating the firmness of PTKPC: "To uphold the integrity and reputation of PTKPC in front of stakeholders, including all contractors.
(3) The implementation approach: Easy implementation, can be directly deducted from the invoice.
(4) Financial considerations: In covering PTPB's deficiencies, the costs incurred are not as large as the contract value, only 11% According to Table 1.6, the average gap in contract compliance but, PTKPC will receive PTPB penalty payments which can help cover the additional cost incurred.

Who

The implementation of warnings and penalties can be directly carried out by the custodian, involving the cost control and administration section of the department. The custodian will verify the amount of the invoice submitted by PTPB and calculate deductions based on PTPB's inability to perform its tasks during that period. Subsequently, the contractor is required to approve the penalty value charged by the custodian to ensure it aligns with the compliance gaps they have caused. The finance department will carry out the deduction by reducing the invoice amount to be paid to the contractor. The amount obtained from these penalties will be added to the OPEX budget of the relevant department, which can be utilized for payments related to additional resources or other departmental needs. The details of the penalties are stipulated in the contract, as shown in Figure 4.16 above, and the PTKPC invoice process and approval can be seen in Figure 4.17 below. The approval for invoice event deductions due to non-compliance can be recommended and executed at the custodian superintendent level.

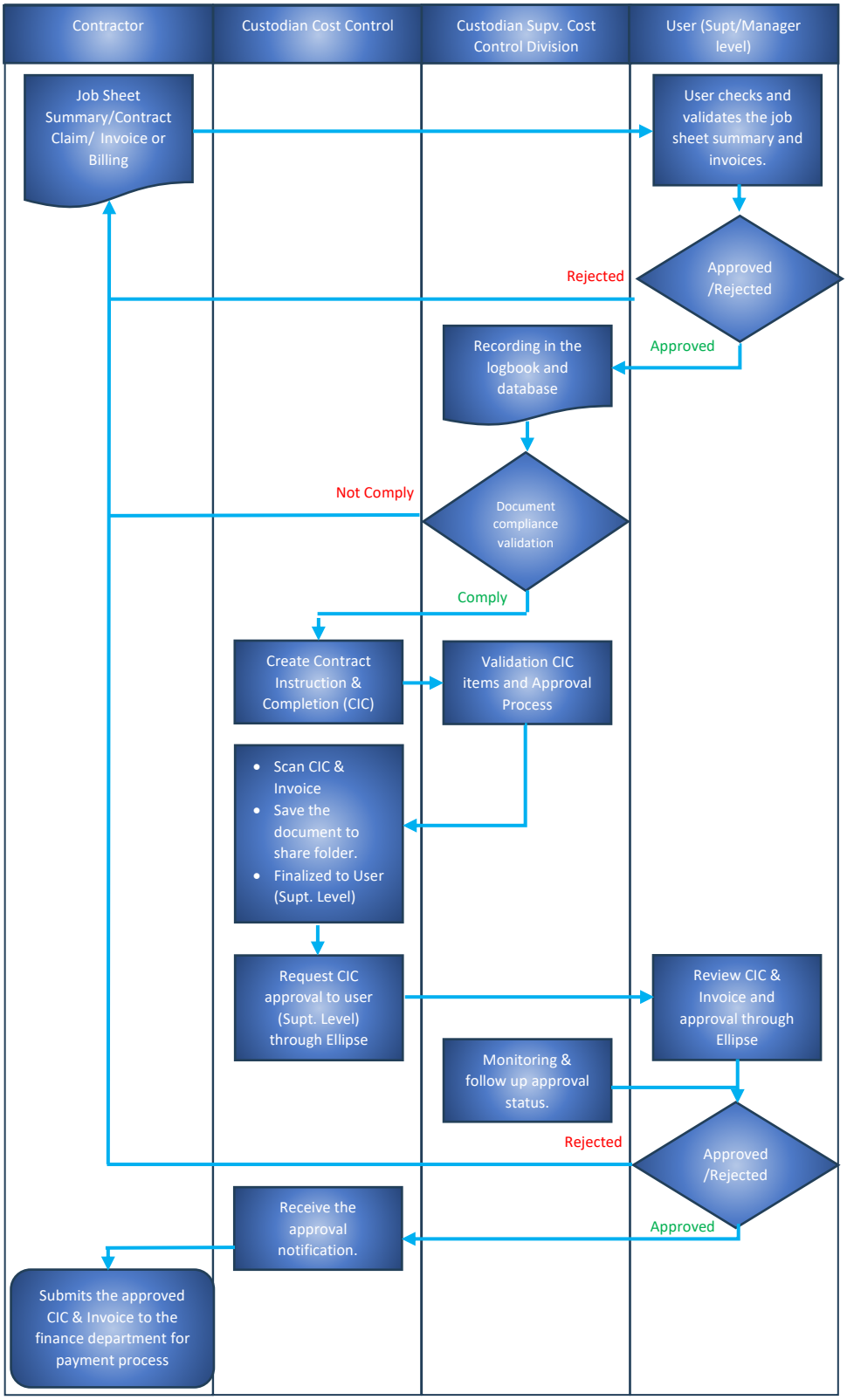
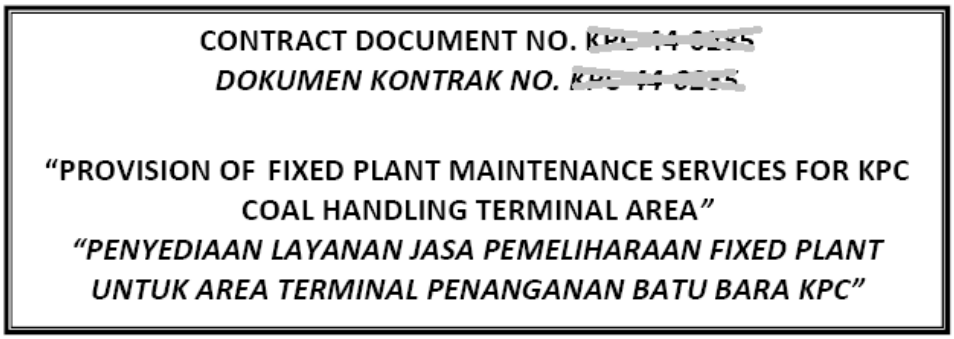


Figure 4. 17 The process flowchart for the invoice process and approval

(Source: Internal data)

Where

The implementation of warnings and penalties will be applied to PTPB that perform conveyor maintenance at the fixed plant coal terminal in accordance with the agreed-upon contract as stated on the document contract could be seen in Figure 4.18 below.


CONTRACT DOCUMENT NO. KPC-14-0285

DOKUMEN KONTRAK NO. KPC-14-0285

"PROVISION OF FIXED PLANT MAINTENANCE SERVICES FOR KPC COAL HANDLING TERMINAL AREA"

"PENYEDIAAN LAYANAN JASA PEMELIHARAAN FIXED PLANT UNTUK AREA TERMINAL PENANGANAN BATU BARA KPC"

Figure 4. 18 Contract Document of PTPB

(Source: Internal data)

When

The implementation can be carried out every month when the PTPB submits the monthly job sheet and invoice. The value is determined by the difference between the actual work performed and the contractual requirements. This alternative has been implemented in some previous periods, but inconsistently due to custodian uncertainty and fear of deteriorating PTPB performance. However, with the completion of this research, custodians will have confidence in applying these warnings and penalties consistently from January 2024 onward until the contract period concludes in December 2024, as indicated in Figure 4.19 below.

A serious reminder until implementation of warnings has been carried out by the custodian towards PTPB, but the contractor has not shown significant improvement in performance. The details of the implemented warning can be seen in Appendix D.

BUDGET VS ACTUAL MONTHLY FEE PTPB

Periode 2021-2024

~~Contract -44-0285~~

		2021	2022												2023												2024											
Category	Budget	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	#	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Total Claim	##########	####	###	###	###	###	###	###	###	###	###	#####	#####	#####	###	###	###	###	###	###	###	###	###	###	Monthly claims by PTPB are based on actual work Executed.											
Total Variance (Deduction by penalty)	##########	####	###	###	###	###	###	###	###	###	###	#####	#####	#####	###	###	###	###	###	###	###	###	###	###	Monthly deductions due to penalties.											
Average budget absorption	87.3%	71.5%	###	###	###	###	###	###	###	###	###	92.9%	89.7%	91.9%	###	###	###	###	###	###	###	###	###		Monthly actual absorption											

8%

Pemotongan pinaltiThe penalty implementation can be consistently applied in the subsequent monthly payment periods.

Figure 4. 19 Scheduled invoice and implementation of the PTPB penalty in 2023-2024

(Source: Author)

How

As explained above, the imposition of penalties can be applied every month when the PTPB submits its invoice. The determination of monthly contractor payment submissions is specified in the contract clauses as per Figure 4.20 below. PTKPC will deduct payments for each instance of PTPB's inability to perform its tasks.

CHARGING METHOD

8.1 Variable Fee

The payment of service will be based on Variable Fee and subject to satisfactory performance to the Company. The payment will be carried on monthly basis based on actual work carried out by the Contractor

The satisfactory performance is indicated by approved Contract Instruction & Completion (CIC). If a CIC has been fully authorized by the Company, the Contractor shall as soon as practicable issue a correct invoice attached with the approved CIC to the Company. The Contractor may issue one invoice for one CIC or collective CICs, provided that the invoice shall be issued and received by the Company within 30-(thirty) days from the date of each individual CIC which has been fully authorized. For any invoices which are issued & submitted beyond 30-(thirty) days unless otherwise provided under the Contract, the Company may cancel both the CIC and the invoice for payment process and the Contractor is deemed to have fully released and forever discharged the Company from any claims and obligations thereunder.

8.2 Term of Payment

Any Advance Payment shall not prevail in this Contract. Payment will be based on monthly progressive claims, which is accumulated of Work Order (WO) and/or Contract Instruction & Completion (CIC) in one invoice or each claim for one invoice subject to satisfactory performance to the Company. The satisfactory performance is indicated by an issuance of Certificate of Practical Completion by the Company against each Work Order (WO) and/or Contract Instruction & Completion (CIC).

The payment will be made within sixty (60) calendar days since the receipt of the invoice by Accounting of the Company

8. METODA PENAGIHAN

8.1 Biaya Variabel

Pembayaran jasa didasarkan pada Biaya Variabel Bulanan dan bergantung pada kepuasan kinerja yang diberikan kepada Perusahaan. Pembayaran akan dilakukan bulanan berdasarkan aktual pekerjaan bulanan yang dilakukan oleh Kontraktor.

Kepuasan kinerja ditandai dengan disetujuinya Instruksi & Penyelesaian Kontrak (CIC). Jika CIC telah disahkan sepenuhnya oleh Perusahaan, Kontraktor harus segera menerbitkan faktur yang benar dilengkapi dengan CIC yang disetujui kepada Perusahaan. Kontraktor dapat menerbitkan satu faktur untuk satu CIC atau beberapa CIC, dengan ketentuan bahwa faktur akan diterbitkan dan diterima oleh Perusahaan dalam 30 (tiga puluh) hari sejak tanggal masing-masing CIC disahkan sepenuhnya. Untuk setiap faktur yang diterbitkan & diserahkan lebih dari 30 (tiga puluh) hari kecuali dinyatakan lain berdasarkan Kontrak, Perusahaan dapat membatalkan baik CIC dan faktur untuk proses pembayaran dan Kontraktor dianggap telah sepenuhnya melepaskan dan selamanya melepaskan Perusahaan dari segala klaim dan kewajiban.

8.2 Masa Pembayaran

Uang Muka tidak diberlakukan dalam Kontrak ini. Pembayaran akan didasarkan pada klaim progressive bulanan, yang mengakumulasikan Perintah Kerja dan/atau Instruksi Kontrak Penyelesaian dalam satu invoice atau tiap tagihan untuk satu invoice mengacu pada kepuasan kinerja oleh Perusahaan. Kepuasan kinerja ditandai dengan diterbitkannya sebuah Sertifikat Penyelesaian Pelaksanaan oleh Perusahaan terhadap tiap Perintah Kerja dan/atau Instruksi Kontrak Penyelesaian.

Pembayaran akan dilakukan dalam enam puluh (60) hari kalender sejak tagihan diterima oleh Akunting Perusahaan

Figure 4. 20 Payment Method of Contract PTPB

(Source: Internal data)

Chapter V Conclusion and Recommendation

This chapter is an essential component providing guidance and a summary of the main research's outcomes. The research started with fundamental research questions about the study's goals. In pursuit of the study's goals, the author applied a range of theoretical techniques, including a review of relevant literature, primary and secondary data collection, qualitative and quantitative analysis, and optimal strategy formulation, to generate a more comprehensive set of conclusions and recommendations.

V.1 Conclusion

After undergoing a comprehensive series of studies, it can be concluded that the results of this research provide a profound understanding of "strategy selection in addressing the inability of PTPB to perform conveyor maintenance at the fixed plant Coal Terminal according to stakeholders' expectations." This study identifies and analyses key findings to address the research questions:

1. *What is the root cause of the contractor's inability to fulfil the contract's compliance requirements to a minimum of 97%?*

   By using a problem tree analysis, it is known to have five root causes that make the PTPB contract underperform, namely:

   - Social and environmental: Social and environmental considerations encompass various factors, including social structures involving the employment of numerous local workers by PTPB to fulfil their commitment to the local community and prevent potential community rejection. Additionally, climate changes affect PTKPC, posing challenges as it operates as an open-pit mining entity. The remote location imposes limitations on qualified resources. Furthermore, being a family-owned company with a UMKM scale, PTPB faces concerns about the environment and health that come with significant costs.

- Regulatory & Permits Factors: regulatory factors significantly impact PTKPC, introducing increased burdens with every regulatory change. The complex requirements and assessments associated with stringent permits contribute to operational challenges. Moreover, regulatory and policy uncertainties, such as the non-smooth transition from PKP2B to IUPK2, have caused delays and confusion for PTKPC in determining effective operational strategies.
- Contractual Factors: Considering the two conditions mentioned above, at that time, PTKPC initiated efficiency by streamlining contracts across the entire organization. Consequently, several tasks were consolidated into one large umbrella contract by expecting of reducing costs by generating a significant workload volume. This situation led contractors to strive for the lowest prices without considering their capabilities and readiness. As a result, in some departments, a sole contractor was engaged like PTPB in CHTD, and PTKPC also implemented contracts with a duration of 3 years with a payment term of 60 days. Additionally, the tender and addendum processes at PTKPC took long process, ranging from 6 to 8 months, and required approval up to the BOD that at that time was not being considered.
- Technical Factors: In connection with the above conditions, this eventually led PTPB to carry out tasks with a lack of workmanship because their primary qualification was limited to belt splicing. Furthermore, to start initial operations, a significant capital investment was required for providing equipment and conducting recruitment, which proved to be beyond PTPB's capacity. This situation resulted in a limited number of suppliers willing to collaborate with PTPB to supply goods, and site management remained unimproved, relying solely on existing resources when PTPB was only engaged in belt splicing work.

- Financial Factors: Due to the extensive scope of work assigned, PTPB has been challenged with its finances due to high capital requirements. Regarding payment methods, PTPB would submit payment requests after completing the work on a monthly basis, with an additional waiting period of 60 days. Moreover, PT KPC faced difficulties in consistently making on-time payments within the 60-day period due to cash flow limitations resulting from the implementation of the IUPK permit. This had a significant impact on PTPB's financial burden, making it increasingly challenging for them to perform the contract while their financial situation relies on uncertain PTKPC payments.

2. *What are the relevant available scenarios to solve the current non-compliance contract performance problem?*

   By employing Stakeholder Analysis and Value-Focused Thinking (VFT) methods, the synthesized analysis results reveal four alternatives to address the current situation, namely:

   - Direct contract termination
   - Contract addendum
   - Counselling & coaching
   - Implementation of warning and penalties

3. *What is the best alternative to face current condition?*

   By using the Analytic Hierarchy Process (AHP) method which involves five decision-makers associated with the PTPB contract at the Coal Terminal and considers five criteria Cost, Quality, Time, and Contract Management the analysis results, with the assistance of AHP Super Decision software, indicate that the "Implementation of warning and penalties" is the best option that can be utilized.

V.2 Recommendation

Regarding the execution of the "Implementation of Warnings and Penalties" as the best alternative based on the analysis results in the previous chapter, the researchers recommend the following:

1. **Timing:** The strategy is ready for immediate implementation and is already in progress.
2. **Affirming PTKPC's Strength:** It aims to showcase the steadfastness of PTKPC in maintaining its integrity and reputation among stakeholders, contractors included.
3. **Implementation Approach:** It involves a straightforward approach, allowing for direct deduction from invoices and facilitating easy implementation.
4. **Financial Considerations:** The costs associated with addressing PTPB's shortcomings are comparatively modest in relation to the overall contract value.

In addition to the recommendations above regarding the implementation of the "Implementation of Warnings and Penalties," the author also proposes that the concept of this research can be applied to other contracts. However, what needs to be considered is the character and uniqueness of each contract, so that the decisions are based on the values of each stakeholder involved in the contract, which also need to be considered in a comprehensive review.

For consideration, In Stage 7 of the tender process flowchart, both commercial and technical qualifications should carry equal weight, rather than just prioritizing the commercial aspect. Additionally, the contract committee should involve the manager and/or general manager from the custodian to oversee, monitor, and provide input before making the tender winner recommendation in Stage 12. Currently, the contract committee consists only of the CEO, CFO, COO, and general manager of the supply division. By implementing this, the tender process will become fairer, and the custodian can ensure the qualifications of all tender participants.

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APPENDICES

Appendix A Interview Transcript

A1. List of interview questions for stakeholders to determine the Power Interest Matrix

Please rate the following statements on a scale of 1 (Least) to 4 (Strongest) for each identified stakeholder:					
Power		1	2	3	4
1	How familiar are you with PTPB?				
2	How familiar are you with the contracts involving PTPB?				
3	To what extent can you directly influence the success or failure of this contract?				
4	How much control do you have over resources or funding critical to the contract?				
5	Are you able to mobilize others or sway public opinion to impact the contract?				
6	How strong is your reputation and legitimacy within the relevant field or community?				
7	To what extent are you likely to actively support or oppose the contract? (1: oppose strongly, 2: oppose somewhat, 3: neutral, 4: strongly support)				
8	How important is it to gain your support for the contract's success? (1: not important, 2: somewhat important, 3: important, 4: crucial)				
9	Do you hold formal authority over the contract's budget, decisions, or resources (1: No formal authority, 4: Significant decision-making power)?				
10	Do you hold informal influence over key individuals or groups involved in the contract (1: limited influence, 4: can sway key decisions)?				
11	Do you control access to information critical for the contract's success (1: minimal control, 4: can block or grant vital information)?				
12	Do you have a strong reputation that could impact the contract's perception (1: little reputation, 4: can significantly influence opinion)?				
13	Do you have legal or regulatory authority that could affect the contract's feasibility or execution (1: No legal impact, 4: Can impede or halt the contract)?				
14	To what extent do you have leverage within the contract itself (e.g., termination clauses, penalty fees) to influence the issue's resolution (1: limited leverage, 4: significant leverage)?				
15	How strong is your legal standing about the contract and the disputed issue (1: weak legal position, 4: strong legal case)?				
16	Is your company financially able to sustain a legal battle or protracted negotiation related to the contract issue (1: limited financial resources, 4: significant financial resources)?				
17	Can you mobilize public opinion or negative PR to exert pressure on the other party in resolving the issue (1: Limited public influence, 4: Can significantly impact public perception)?				
18	How strongly do your reputation and credibility influence the other party's willingness to accommodate your demands (1: easily dismissed, 4: commands respect and cooperation)?				
19	How open are you to finding a mutually agreeable compromise on the issue (1: Inflexible and demanding, 4: Willing to make concessions)?				
20	What is your ideal outcome for resolving the contract issue (1: Unclear or unrealistic expectations, 4: Clearly defined and achievable goals)?				
21	Would you consider alternative dispute resolution methods (e.g., mediation, arbitration) instead of legal action (1: unwilling to consider alternatives, 4: open to non-litigious solutions)?				

Please rate the following statements on a scale of 1 (Least) to 4 (Strongest) for each identified stakeholder:					
Interest		1	2	3	4
1	How knowledgeable are you about the issue or area affected by the contract?				
2	To what extent will you benefit or lose out from the contract's success or failure?				
3	Have you been actively engaged in or supportive of similar contracts before?				
4	How high is your overall level of awareness and concern about the project?				
5	Do you have a personal stake in the contract's outcome, directly affecting their finances, career, or other interests (1: No personal stake, 4: Significant personal investment)?				
6	Do your organization's mission or values align with the contract's goals, creating positive or negative alignment (1: no alignment, 4: strongly aligned)?				
7	Have you been involved in similar contracts before, and if so, what was your level of engagement and support (1: no relevant experience, 4: actively involved and supportive)?				
8	What specific benefits would you gain from the contract's success (1: minimal benefits, 4: substantial positive impact)?				
9	What specific risks or drawbacks would you face if the contract fails (1: minimal negative impact, 4: significant potential losses)?				
10	How do you prefer to receive information and updates about the contract (1: Difficult to reach, 4: Actively seeks updates)?				
11	How open are you to collaborating with other stakeholders or providing input on the contract (1: resistant to collaboration, 4: eager to participate)?				
12	What potential obstacles might hinder your engagement or support for the contract (1: a few potential obstacles, 4: significant challenges to communication or collaboration)?				
13	What specific strategies would likely be most effective in engaging you and securing your support (1: general information updates, 4: tailored incentives and participation opportunities)?				
14	Are there other stakeholders who could act as allies in influencing or gaining your support? (1: No potential allies; 4: Strong network of potential allies)?				
15	How significantly will the issue's resolution financially impact your company's financial situation (positive or negative) (1: minimal financial impact, 4: significant financial gain or loss)?				
16	Will the issue's resolution disrupt or hinder your operations or business continuity (1: minor operational impact, 4: significant disruption to operations)?				
17	How will the issue's resolution and associated actions impact your public image and reputation (1: minimal reputational impact, 4: significant potential damage or boost to reputation)?				
18	Does the issue align with your broader strategic goals and objectives (1: Tangentially related, 4: Central to their strategic agenda)?				
19	Could the resolution of this issue set a precedent that impacts future contracts or relationships with you (1: Isolated incident, 4: Sets a broader precedent)?				
20	What is your preferred negotiation style (e.g., collaborative, aggressive, legalistic) and how will it impact the resolution process (1: Difficult to work with, 4: Open to constructive solutions)?				
21	How willing are you to share information relevant to the issue and contribute to collaborative problem-solving (1: Reluctant to share information, 4: Open and transparent)?				

A2. The results from all stakeholders regarding the power questionnaire

Stakeholder Group	CTMD								CT Operation				CQC			MKT department		Contract department		Finance department			PTPB			
	MYH	SR	NS	BY	TH	RA	MLW	RP	BS	HK	ARF	YM	HRN	PD	DS	WK	RR	NY	HS	EF	SH	CA	AJ	YK	MS	RI
No. of Question	Power																									
1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2	4	4	3	4	4	4	4	3	4	4	4	4	4	3	4	4	4	3	4	4	4	3	4	4	4	3
3	3	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2
4	3	3	2	2	2	2	2	2	3	3	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2
5	4	3	4	3	2	2	2	2	4	3	4	3	2	2	2	2	4	3	4	3	2	2	2	2	2	2
6	3	2	3	3	3	2	2	1	3	2	3	3	3	2	2	1	3	2	3	3	3	2	2	1	2	1
7	4	4	4	4	4	3	3	3	4	4	4	4	4	3	3	3	4	4	4	4	4	3	3	3	3	3
8	4	3	4	3	4	3	3	3	4	3	4	3	4	3	3	3	4	3	4	3	4	3	3	3	3	3
9	4	3	3	3	3	3	3	3	4	3	3	3	3	3	3	3	4	3	3	3	3	3	3	3	3	3
10	3	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	4	2	2	2	2	2	2	2	2	2
11	4	3	3	3	3	4	3	3	4	3	4	3	3	3	3	4	3	3	3	4	3	3	3	4	3	3
12	3	2	3	3	3	2	2	2	3	2	3	3	3	2	2	2	4	2	3	3	3	2	2	2	2	2
13	3	2	2	3	2	2	2	2	3	2	2	2	3	2	2	2	3	3	2	2	2	3	2	2	2	3

Stakeholder Group	CTMD								CT Operation				CQC			MKT department		Contract department		Finance department			PTPB			
	MYH	SR	NS	BY	TH	RA	MLW	RP	BS	HK	ARF	YM	HRN	PD	DS	WK	RR	NY	HS	EF	SH	CA	AJ	YK	MS	RI
No. of Question	Power																									
14	3	3	3	2	2	2	2	2	3	3	3	2	2	2	2	2	3	3	3	2	2	2	2	2	2	2
15	4	4	4	3	3	3	3	3	4	4	4	3	3	3	3	3	4	4	4	3	3	3	3	3	3	3
16	4	3	3	3	3	3	3	3	4	3	3	3	3	3	3	3	4	3	3	3	3	3	3	3	3	3
17	3	2	2	2	3	2	2	2	3	3	2	2	2	2	3	2	3	2	3	2	2	2	3	2	2	2
18	3	2	3	2	2	2	2	2	4	3	3	2	2	2	3	2	3	2	3	3	2	2	2	2	3	2
19	4	2	3	2	2	2	2	2	3	2	3	2	2	2	2	2	3	2	3	2	2	2	2	2	2	2
20	3	2	2	2	2	3	2	2	3	2	2	2	3	2	2	2	3	3	2	2	2	2	3	2	2	3
21	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	3	4	4	4	4	3	4	4	4	3

A3. The results from all stakeholders regarding the interest questionnaire

Stakeholder Group	CTMD								CT Operation				CQC			MKT department		Contract department		Finance department			PTPB			
	MYH	SR	NS	BY	TH	RA	MLW	RP	BS	HK	ARF	YM	HRN	PD	DS	WK	RR	NY	HS	EF	SH	CA	AJ	YK	MS	RI
No. of Question	INTEREST																									
1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3	4	4	4	3	3	3	3	3	4	4	4	3	3	3	3	3	4	4	4	3	3	3	3	3	3	3
4	4	4	4	3	3	3	3	3	4	4	4	3	3	3	3	3	4	4	4	3	3	3	3	3	3	3
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
7	4	4	3	3	3	3	3	3	4	4	3	3	3	3	3	3	4	4	3	3	3	3	3	3	3	3
8	4	3	3	3	4	3	3	3	4	3	3	3	4	3	3	3	4	3	3	3	4	3	3	3	3	3
9	4	3	3	3	3	3	3	3	4	3	3	3	3	3	3	3	4	3	3	3	3	3	3	3	3	3
10	4	3	3	3	3	2	2	2	4	3	3	3	3	2	2	2	4	3	3	3	3	2	2	2	2	2
11	4	4	4	4	3	4	4	4	4	3	4	4	4	4	3	4	4	4	4	3	4	4	4	3	4	4
12	4	3	3	3	3	3	3	3	4	3	3	3	2	3	3	3	2	3	3	3	2	3	3	3	2	3

Stakeholder Group	CTMD								CT Operation				CQC			MKT department		Contract department		Finance department			PTPB			
	MYH	SR	NS	BY	TH	RA	MLW	RP	BS	HK	ARF	YM	HRN	PD	DS	WK	RR	NY	HS	EF	SH	CA	AJ	YK	MS	RI
No. of Question	INTEREST																									
13	4	4	4	4	4	4	3	4	4	4	4	3	4	4	4	3	4	4	4	3	4	4	4	3	4	3
14	4	3	3	4	4	3	3	3	4	3	3	4	4	3	3	3	4	3	3	4	4	3	3	3	3	3
15	3	3	3	3	3	3	3	2	3	3	3	3	2	3	3	3	3	2	3	3	3	2	3	3	3	2
16	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	3	4	4	4	4	3	4	4	3	4
17	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
18	4	3	3	4	4	3	3	3	4	3	3	4	4	3	3	3	4	3	3	4	4	3	3	3	3	3
19	4	4	4	4	4	4	4	3	4	4	3	4	4	4	4	3	4	4	4	4	3	4	4	4	4	3
20	4	4	4	3	4	3	3	3	4	4	4	3	4	3	3	3	4	4	4	3	4	3	3	3	3	3
21	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

A4. Generate alternatives with PTPB's key person, including the pros and cons of the alternatives

Research Questions	Interview Questions	Objectives description	Target	PTPB			
				AJ	YK	MS	RI
What is the root cause of the contractor's inability to fulfill the contract's compliance requirements?	What were your obstacles while carrying out your duties at PTPB?	To find out the challenges faced by employees in carrying out their duties and responsibilities	ALL participants of PTPB employees	The initially available organic employees at PTPB are primarily focused on belt splicing, so it takes time to fulfill other scopes of work such as welding tasks and the provision of materials along with supporting equipment.	The limited operational costs of PTPB and its strong dependence on PTKPC payments.	The limited availability of manpower and a mismatch with the required skills.	The job and skill resources are inadequate
	What hinders you from making decisions at work?	To find out the constraints of employees in deciding	ALL participants of PTPB employees	There is no dedicated support, however, the support from the head office of PTPB seems to be slow and unprepared to meet the on-site needs according to the extensive coverage of the contract.	Site management is unable to make specific decisions, especially regarding resources and finances.	An all-in compensation system makes it difficult for supervisors to instruct employees to work overtime when needed.	The head office does not implement an overtime payment system.
	How often do you make decisions regarding your task in PTPB?	To find out the frequency interval of workers making decisions	ALL participants of PTPB employees	Almost every day involves routine tasks, but decisions related to material procurement, or the addition of resources are exclusively handled by the head office.	Almost frequently, but only related to organizing resources for routine tasks.	Almost every day, specifically related to fieldwork requirements.	Almost every day, specifically related to fieldwork requirements.
	How often does the head office intervene in decisions made at the Sangatta Site?	To find out the scope of authority for site management at PTPB	ALL participants of PTPB employees	For matters unrelated to finances, the head office typically does not intervene significantly. However, if financial aspects are involved, decisions are made by the head office, and the site is expected to accept and implement those decisions. Even for the procurement of boxed meals for employees working overtime, decisions must come from the head office.	Always, when it comes to financial aspects and number of employees.	The head office rarely has direct interactions with field supervisors.	Not sure, as the head office rarely interacts with field supervisors.
	What assistance is needed to support PTPB's performance in Sangatta?	To explore the obstacles faced by PTPB in implementing PTPB's new contract in Sangatta	ALL participants of PTPB employees	Full Support from the head office of PTPB but obtaining such support can be challenging if the invoice payments from PTKPC are not made on time. This is because the head office tends to delay responding to the needs of the Sangatta site due to outstanding invoices from PTKPC.	Adjustment of contract values for each item from PTKPC.	Employee rates are adjusted to encourage willingness to work overtime.	The custodian assists in ensuring that the payroll for PTPB employees can be processed on time.

Research Questions	Interview Questions	Objectives description	Target	PTPB			
				AJ	YK	MS	RI
	What is your advice for your custodian and manager to improve PTPB performance in Sangatta?	To find out if there is a gap in PTPB's internal communication between the head office and the site as well as the custodian	ALL participants of PTPB employees	To ensure timely payments, the custodian should collaborate with PTKPC's finance department, emphasizing adherence to the agreed-upon contract terms, specifically aiming for payments within 60 days after document acceptance. For future considerations, the manager/head office of PTPB should thoroughly evaluate the scope of work to be undertaken, especially for new tasks for PTPB. This includes reviewing each item in detail in the contract rates, rather than solely focusing on the overall contract value.	The custodian of PTKPC ensures timely payment of invoices to prevent any delays in the salaries of PTPB employees.	PTPB management ensures a review of the scope of work in the contract. Custodian, please review the contract value related to man-hours.	PTPB submits a request for the addition of supervisors to PTKPC through the contract's custodian.
	Will you still be working at PTPB in the next 3–5 years?	To find out how comfortable employees work at PTPB	ALL participants of PTPB employees	Yes, if I am still employed by PTPB	Yes, but if I have a better opportunity, I will leave the PTPB	Yes, because my expertise in conveyor splicing	Yes, because my expertise in conveyor splicing

A5. Generate Alternatives with key person CTMD

Research Questions	Interview Questions	Objectives description	Target	CTMD							
				MYH	SR	NS	BY	TH	RA	MLW	RP
What is the relevant available alternative to solve the current non-compliance contract performance problem and what is the best alternative?	What scenarios could possibly be considered at this time to solve the problem?	To find out what options can be taken at this time.	Contract personnel, custodian, and CTMD planner	Direct contract termination, Contract addendum, keep counselling & coaching and Implementation of warning and penalties	Contract addendum, Implementation of penalties & Warning followed by coaching and mentoring.	Contract addendum and Implementation of penalties and warning	Contract addendum and Implementation of penalties and warning	Contract addendum and Implementation of penalties and warning	Contract addendum or contract termination replace with another contractor	Contract addendum or contract termination replace with another contractor	Contract addendum or contract termination replace with another contractor
	What are the constraints of each scenario?	To find out the challenges and benefits of each of these scenarios,	Contract personnel, custodian, and CTMD planner	Direct Contract Termination => specific skill. Only 2 contractors have the qualifications for conveyor maintenance in Sangatta, namely PTCMP and PTPB. The process of creating a new contract takes 6-8 months. Operational needs at PTKPC's fixed plant in the coal terminal must not be disrupted.	Contract Addendum => duration 6-8 months because it is like creating a new contract, including review and approval by the contract committee. It may not be approved immediately.	Mentoring and coaching => extra cost will apply to cover PTPB's shortcomings; short or long-term success is uncertain, creating an impression of weakness of PTKPC.	Mentoring and coaching => extra cost will apply to cover PTPB's shortcomings; short or long-term success is uncertain, creating an impression of weakness of PTKPC.	Implementation of penalties and warnings => extra cost as it will incur additional expenses to cover PTPB's shortcomings; long-term success is uncertain and making it difficult for PTPB's finances.			

Research Questions	Interview Questions	Objectives description	Target	CTMD							
				MYH	SR	NS	BY	TH	RA	MLW	RP
				Need capital equivalent to the existing contract, or even larger, due to the previous contract being a package deal involving several jobs.							
	What are the advantages of each scenario?	To find out the benefits and impacts of each existing scenario on problem-solving	Contract personnel, custodian, and CTMD planner	Direct Contract Termination => It will demonstrate PT KPC's firmness, although it may not stop or mitigate PTKPC's losses because the replacement process and contractor cannot be guaranteed due to the lengthy contract processes of PTKPC. This is considering the operational demands for fixed plant availability,	Contract Addendum => It can improve the current contract rate to align with market prices, which will aid PTPB financially. However, the process is lengthy, like creating a new contract, and its approval by the contract committee is not guaranteed. Fixed Plant maintenance process continue as it has been. The costs incurred are not as significant as	Mentoring and coaching => In the long term, it will enhance PTPB's capabilities beyond conveyor belt work, but the incurred costs will persist, does not require committee approval, can be directly handled by the custodian and contract department; the costs incurred are not as large as the contract value; they only cover the shortfall of	Mentoring and coaching => In the long term, it will enhance PTPB's capabilities beyond conveyor belt work, but the incurred costs will persist, does not require committee approval, can be directly handled by the custodian and contract department; the costs incurred are not as large as the contract value; they only cover the shortfall of	Implementation of penalties and warnings => Has been done currently, but it has not consistently resulted in success due to side effects that further complicate PTPB's finances, impacting PTPB's performance. The costs incurred are not as large as the contract value, only 11% According to table 1.6, the average gap in contract compliance,	of penalties and warnings => Has been done currently, but it has not consistently resulted in success due to side effects that further complicate PTPB's finances, impacting PTPB's performance. The costs incurred are not as large as the contract value, only 11% According to table 1.6, the average gap in contract compliance, However, we		

Research Questions	Interview Questions	Objectives description	Target	CTMD							
				MYH	SR	NS	BY	TH	RA	MLW	RP
				with a minimum requirement of 94%.	the contract value, only in specific areas where PTPB is unable to fulfill, namely fabrication & liner maintenance, with a weight of 13.4% of the contract value as per table 1.18 above.	PTPB. However, they will absorb costs from other CHTM (Cost Head and Type of Material) codes because direct orders cannot use the contract service code, according to table 1.6, the average gap in contract compliance is only 11%.	PTPB. However, they will absorb costs from other CHTM (Cost Head and Type of Material) codes because direct orders cannot use the contract service code, according to table 1.6, the average gap in contract compliance is only 11%.	However, we will receive penalty payments due to PTPB's inability to fulfill its responsibilities , which, at the very least, can help offset the additional cost of 11% from the contract compliance gap in table 1.6 above.	will receive penalty payments due to PTPB's inability to fulfill its responsibilities , which, at the very least, can help offset the additional cost of 11% from the contract compliance gap in table 1.6 above.		
	What is your best scenario, and how sure are you of the best scenario in percentage?	To measure the confidence level in the selected scenario	Contract personnel , custodian , and CTMD planner	Combination of Implementation of penalties and warnings and Contract Addendum (51%)	Combination of Implementation of penalties and warnings and Contract Addendum (50%)	Combination of Implementation of penalties and warnings and Contract Addendum (55%)	Combination of Implementation of penalties and warnings and Contract Addendum (55%)	Combination of Implementation of penalties and warnings and Contract Addendum (45%)	Combination of Implementation of penalties and warnings and Contract Addendum (45%)	Combination of Implementation of penalties and warnings and Contract Addendum (50%)	Combination of Implementation of penalties and warnings and Contract Addendum (50%)
	Who has to approve the chosen scenario?	To know the rote approval in the business process	Contract personnel , custodian , and CTMD planner	The contract committee includes the CEO for addendum & CTM for Implementation of penalties and warnings.	The contract committee includes the CEO for addendum & CTM for Implementation of penalties and warnings.	The contract committee includes the CEO for addendum & CTM for Implementation of penalties and warnings.	The contract committee includes the CEO for addendum & CTM for Implementation of penalties and warnings.	The contract committee includes the CEO for addendum & CTM for Implementation of penalties and warnings.	The contract committee includes the CEO for addendum & CTM for Implementation of penalties and warnings.	The contract committee includes the CEO for addendum & CTM for Implementation of penalties and warnings.	The contract committee for addendum & CTM for Implementation of penalties and warnings.

Research Questions	Interview Questions	Objectives description	Target	CTMD							
				MYH	SR	NS	BY	TH	RA	MLW	RP
	How long does the approval process take?	To find out the required processing time.	Contract personnel, custodian, and CTMD planner	Addendum => 6 to 8 months if approved directly without revisions or rejections. Warning & penalty already applied.	Addendum => 6 to 8 months if approved directly without revisions or rejections. Warning & penalty already applied.	Addendum => 6 to 8 months if approved directly without revisions or rejections. Warning & penalty already applied.	Addendum => 6 to 8 months if approved directly without revisions or rejections. Warning & penalty already applied.	Addendum => 6 to 8 months if approved directly without revisions or rejections. Warning & penalty already applied.	Addendum => 6 to 8 months if approved directly without revisions or rejections. Warning & penalty already applied.	Addendum => 6 to 8 months if approved directly without revisions or rejections. Warning & penalty already applied.	Addendum or change contract => 6 to 8 months if approved directly without revisions or rejections. Warning & penalty already applied.
	Is there a similar case with other contractors?	To find out how often this case occurs in the KPC area.	Contract personnel, custodian, and CTMD planner	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	What are the minimum requirements that must be met by contractors if they want to take part in a tender at PTKPC?	To find out the mandatory and minimum requirements for every company that wants to become a PTKPC contractor	Contract personnel, custodian, and CTMD planner	Having qualifications that align with scope of work, being certified, and already registered in CMS (Contract Management System) of PTKPC.	Having qualifications that align with scope of work, being certified, and already registered in CMS (Contract Management System) of PTKPC.	Having qualifications that align with scope of work, being certified, and already registered in CMS (Contract Management System) of PTKPC.	Having qualifications that align with scope of work, being certified, and already registered in CMS (Contract Management System) of PTKPC.	Having qualifications that align with scope of work, being certified, and already registered in CMS (Contract Management System) of PTKPC.	Having qualifications that align with scope of work, being certified, and already registered in CMS (Contract Management System) of PTKPC.	Having qualifications that align with scope of work, being certified, and already registered in CMS (Contract Management System) of PTKPC.	Having qualifications that align with scope of work, being certified, and already registered in CMS (Contract Management System) of PTKPC.
	From the existing root causes, what preventive actions	To explore what items can be improved in the current procedure	Contract personnel, custodian, and	For critical tasks, avoid using a single contractor, and refrain from assigning	For critical tasks, avoid using a single contractor, and refrain from assigning	For critical tasks, avoid using a single contractor, and refrain from assigning	For critical tasks, avoid using a single contractor, and refrain from assigning	For critical tasks, avoid using a single contractor, and refrain from assigning	For critical tasks, avoid using a single contractor, and refrain from assigning	For critical tasks, avoid using a single contractor, and refrain from	For critical tasks, avoid using a single contractor, and refrain from

Research Questions	Interview Questions	Objectives description	Target	CTMD							
				MYH	SR	NS	BY	TH	RA	MLW	RP
	must we add to the tender procedure?		CTMD planner	extensive scopes of work to contractors with UMKM levels. When determining rates within a contract, ensure they are rational and compliant with the regulation. Assess contractors who aggressively underbid rate with the goal of winning the tender.	extensive scopes of work to contractors with UMKM levels. When determining rates within a contract, ensure they are rational and compliant with the regulation. Assess contractors who aggressively underbid rate with the goal of winning the tender. Ensure that tender participants have adequate qualifications and quality, especially for new contractors or new tasks. Ensure that the agreed-upon terms of payment in the contract can be consistently fulfilled by PTKPC.	extensive scopes of work to contractors with UMKM levels. When determining rates within a contract, ensure they are rational and compliant with the regulation. Assess contractors who aggressively underbid rate with the goal of winning the tender. Ensure that tender participants have adequate qualifications and quality, especially for new contractors or new tasks. Ensure that the agreed-upon terms of payment in the contract can be consistently fulfilled by PTKPC. Avoid giving long contract	extensive scopes of work to contractors with UMKM levels. When determining rates within a contract, ensure they are rational and compliant with the regulation. Assess contractors who aggressively underbid rate with the goal of winning the tender. Ensure that tender participants have adequate qualifications and quality, especially for new contractors or new tasks. Ensure that the agreed-upon terms of payment in the contract can be consistently fulfilled by PTKPC.	extensive scopes of work to contractors with UMKM levels. When determining rates within a contract, ensure they are rational and compliant with the regulation. Assess contractors who aggressively underbid rate with the goal of winning the tender. Ensure that tender participants have adequate qualifications and quality, especially for new contractors or new tasks. Ensure that the agreed-upon terms of payment in the contract can be consistently fulfilled by PTKPC.	extensive scopes of work to contractors with UMKM levels. When determining rates within a contract, ensure they are rational and compliant with the regulation. Assess contractors who aggressively underbid rate with the goal of winning the tender. Ensure that tender participants have adequate qualifications and quality, especially for new contractors or new tasks. Ensure that the agreed-upon terms of payment in the contract can be consistently fulfilled by PTKPC.	assigning extensive scopes of work to contractors with UMKM levels. When determining rates within a contract, ensure they are rational and compliant with the regulation. Assess contractors who aggressively underbid rate with the goal of winning the tender. Ensure that tender participants have adequate qualifications and quality, especially for new contractors or new tasks. Ensure that the agreed-upon terms of payment in the contract can be	assigning extensive scopes of work to contractors with UMKM levels. When determining rates within a contract, ensure they are rational and compliant with the regulation. Assess contractors who aggressively underbid rate with the goal of winning the tender. Ensure that tender participants have adequate qualifications and quality, especially for new contractors or new tasks. Ensure that the agreed-upon terms of payment in the contract can be

Research Questions	Interview Questions	Objectives description	Target	CTMD							
				MYH	SR	NS	BY	TH	RA	MLW	RP
						durations for new contractors or new projects immediately.				consistently fulfilled by PTKPC.	consistently fulfilled by PTKPC.
	Can we immediately implement these preventive actions during the next tender period?	To find out the challenges in implementing the suggested corrective actions	Contract personnel, custodian, and CTMD planner	Yes, by admitting contract committee approval	Yes, by admitting contract committee approval	Yes, by admitting contract committee approval	Yes, by admitting contract committee approval	Yes, by admitting contract committee approval	Yes, by admitting contract committee approval	Yes, by admitting contract committee approval	Yes, by admitting contract committee approval
	If not, what procedures must we go through to be able to add these preventive actions?	To find out what steps should be taken later in implementing these corrective actions	Contract personnel, custodian, and CTMD planner								

A6. Generate alternatives with Contract's key person, including the pros and cons of the alternatives

Research Questions	Interview Questions	Objectives description	Target	Contract Department	
				NY	HS
What is the relevant available alternative to solve the current non-compliance contract performance problem and what is the best alternative?	What scenarios could possibly be considered at this time to solve the problem?	To find out what options can be taken at this time.	Contract personnel, custodian, and CTMD planner	Direct contract termination, Contract addendum, keep counselling & coaching and Implementation of warning and penalties	Direct contract termination, Contract addendum, keep counselling & coaching and Implementation of warning and penalties
	What are the constraints of each scenario?	To find out the challenges and benefits of each of these scenarios,	Contract personnel, custodian, and CTMD planner	Direct Contract Termination => specific skill. Only 2 contractors have the qualifications for conveyor maintenance in Sangatta, namely PTCMP and PTPB. The process of creating a new contract takes 6-8 months. Operational needs at PTKPC's fixed plant in the coal terminal must not be disrupted. Need capital equivalent to the existing contract, or even larger, due to the previous contract being a package deal involving several jobs.	Contract Addendum => duration 6-8 months because it is like creating a new contract, including review and approval by the contract committee. It may not be approved immediately.
	What are the advantages of each scenario?	To find out the benefits and impacts of each existing scenario on problem-solving	Contract personnel, custodian, and CTMD planner	Direct Contract Termination => It will demonstrate PT KPC's firmness, although it may not stop or mitigate PTKPC's losses because the replacement process and contractor cannot be guaranteed due to the lengthy contract processes of PTKPC. This is considering the operational demands for fixed plant availability, with a minimum requirement of 94%.	Contract Addendum => It can improve the current contract rate to align with market prices, which will aid PTPB financially. However, the process is lengthy, like creating a new contract, and its approval by the contract committee is not guaranteed. Fixed Plant maintenance process continue as it has been. The costs incurred are not as significant as the contract value, only in specific areas where PTPB is unable to fulfill, namely fabrication & liner maintenance, with a weight of 13.4% of the contract value as per table 1.18 above.
	What is your best scenario, and how sure are you of the best scenario in percentage?	To measure the confidence level in the selected scenario	Contract personnel, custodian, and CTMD planner	Implementation of penalties & warnings and mentoring and coaching, as for an addendum or replacement of the contract in the current IUPK period, it will be very challenging due to the high operational costs (75%).	Implementation of penalties & warnings and mentoring and coaching, as for an addendum or replacement of the contract in the current IUPK period, it will be very challenging due to the high operational costs (75%).

Research Questions	Interview Questions	Objectives description	Target	Contract Department	
				NY	HS
	Who has to approve the chosen scenario?	To know the rote approval in the business process	Contract personnel, custodian, and CTMD planner	Custodian department & Finance only	Custodian department & Finance only
	How long does the approval process take?	To find out the required processing time.	Contract personnel, custodian, and CTMD planner	Immediately	Immediately
	Is there a similar case with other contractors?	To find out how often this case occurs in the KPC area.	Contract personnel, custodian, and CTMD planner	Yes	Yes
	What are the minimum requirements that must be met by contractors if they want to take part in a tender at PTKPC?	To find out the mandatory and minimum requirements for every company that wants to become a PTKPC contractor	Contract personnel, custodian, and CTMD planner	Having qualifications that align with scope of work, being certified, and already registered in CMS (Contract Management System) of PTKPC.	Having qualifications that align with scope of work, being certified, and already registered in CMS (Contract Management System) of PTKPC.
	From the existing root causes, what preventive actions must we add to the tender procedure?	To explore what items can be improved in the current procedure	Contract personnel, custodian, and CTMD planner	For critical tasks, avoid using a single contractor, and refrain from assigning extensive scopes of work to contractors with UMKM levels. When determining rates within a contract, ensure they are rational and compliant with the regulation. Assess contractors who aggressively underbid rate with the goal of winning the tender. Ensure that tender participants have adequate qualifications and quality, especially for new contractors or new tasks. Ensure that the agreed-upon terms of payment in the contract can be consistently fulfilled by PTKPC.	For critical tasks, avoid using a single contractor, and refrain from assigning extensive scopes of work to contractors with UMKM levels. When determining rates within a contract, ensure they are rational and compliant with the regulation. Assess contractors who aggressively underbid rate with the goal of winning the tender. Ensure that tender participants have adequate qualifications and quality, especially for new contractors or new tasks. Ensure that the agreed-upon terms of payment in the contract can be consistently fulfilled by PTKPC.
	Can we immediately implement these preventive actions during the next tender period?	To find out the challenges in implementing the suggested corrective actions	Contract personnel, custodian, and CTMD planner	Yes, by admitting contract committee approval	Yes, by admitting contract committee approval
	If not, what procedures must we go through to be able to add these preventive actions?	To find out what steps should be taken later in implementing these corrective actions	Contract personnel, custodian, and CTMD planner		

A7. Generate alternatives with CTOD's key person, including the pros and cons of the alternatives.

Research Questions	Interview Questions	Objectives description	Target	CTOD			
				BS	HK	ARF	YM
What is the relevant available alternative to solve the current non-compliance contract performance problem and what is the best alternative?	What scenarios could possibly be considered at this time to solve the problem?	To find out what options can be taken at this time.	Contract personnel, custodian, and CTMD planner	Termination and change the contractor or Contract addendum	Contract addendum, Implementation of penalties or terminate the contract and replace the contractor	Termination and change the contractor or Contract addendum	Contract addendum, Implementation of penalties or terminate the contract and replace the contractor
	What are the constraints of each scenario?	To find out the challenges and benefits of each of these scenarios,	Contract personnel, custodian, and CTMD planner				
	What are the advantages of each scenario?	To find out the benefits and impacts of each existing scenario on problem-solving	Contract personnel, custodian, and CTMD planner				
	What is your best scenario, and how sure are you of the best scenario in percentage?	To measure the confidence level in the selected scenario	Contract personnel, custodian, and CTMD planner	Termination and change the contractor or Contract addendum (50%)	Contract addendum (50%)	Termination and change the contractor or Contract addendum (50%)	Contract addendum (50%)
	Who has to approve the chosen scenario?	To know the rote approval in the business process	Contract personnel, custodian, and CTMD planner	The contract committee for addendum & change contract	The contract committee for addendum	The contract committee for addendum & change contract	The contract committee for addendum
	How long does the approval process take?	To find out the required processing time.	Contract personnel, custodian, and CTMD planner	Addendum or change contract => 6 to 8 months if approved directly without revisions or rejections.	Addendum => 6 to 8 months if approved directly without revisions or rejections.	Addendum or change contract => 6 to 8 months if approved directly without revisions or rejections.	Addendum => 6 to 8 months if approved directly without revisions or rejections.

Research Questions	Interview Questions	Objectives description	Target	CTOD			
				BS	HK	ARF	YM
	Is there a similar case with other contractors?	To find out how often this case occurs in the KPC area.	Contract personnel, custodian, and CTMD planner	Yes	Yes	Yes	
	What are the minimum requirements that must be met by contractors if they want to take part in a tender at PTKPC?	To find out the mandatory and minimum requirements for every company that wants to become a PTKPC contractor	Contract personnel, custodian, and CTMD planner	Having qualifications that align with scope of work, being certified, and already registered in CMS (Contract Management System) of PTKPC.	Having qualifications that align with scope of work, being certified, and already registered in CMS (Contract Management System) of PTKPC.	Having qualifications that align with scope of work, being certified, and already registered in CMS (Contract Management System) of PTKPC.	
	From the existing root causes, what preventive actions must we add to the tender procedure?	To explore what items can be improved in the current procedure	Contract personnel, custodian, and CTMD planner	For critical tasks, avoid using a single contractor, and refrain from assigning extensive scopes of work to contractors with UMKM levels. When determining rates within a contract, ensure they are rational and compliant with the regulation. Assess contractors who aggressively underbid rate with the goal of winning the tender. Ensure that tender participants have adequate qualifications and quality, especially for new contractors or new tasks. Ensure that the agreed-upon terms of	For critical tasks, avoid using a single contractor, and refrain from assigning extensive scopes of work to contractors with UMKM levels. When determining rates within a contract, ensure they are rational and compliant with the regulation. Assess contractors who aggressively underbid rate with the goal of winning the tender. Ensure that tender participants have adequate qualifications and quality, especially for new contractors or new tasks. Ensure that the agreed-upon terms of payment in the contract can be consistently fulfilled by PTKPC.	For critical tasks, avoid using a single contractor, and refrain from assigning extensive scopes of work to contractors with UMKM levels. When determining rates within a contract, ensure they are rational and compliant with the regulation. Assess contractors who aggressively underbid rate with the goal of winning the tender. Ensure that tender participants have adequate qualifications and quality, especially for new contractors or new tasks. Ensure that the agreed-upon terms of payment in the contract can be consistently fulfilled by PTKPC.	

Research Questions	Interview Questions	Objectives description	Target	CTOD			
				BS	HK	ARF	YM
				payment in the contract can be consistently fulfilled by PTKPC.			
	Can we immediately implement these preventive actions during the next tender period?	To find out the challenges in implementing the suggested corrective actions	Contract personnel, custodian, and CTMD planner	Yes, by admitting contract committee approval	Yes, by admitting contract committee approval	Yes, by admitting contract committee approval	
	If not, what procedures must we go through to be able to add these preventive actions?	To find out what steps should be taken later in implementing these corrective actions	Contract personnel, custodian, and CTMD planner				

A8. Generate alternatives with Finance's key person, including the pros and cons of the alternatives.

Research Questions	Interview Questions	Objectives description	Target	Finance Department		
				EF	SH	CA
What is the relevant available alternative to solve the current non-compliance contract performance problem and what is the best alternative?	What scenarios could possibly be considered at this time to solve the problem?	To find out what options can be taken at this time.	Contract personnel, custodian, and CTMD planner	Implementation of penalties, Contract addendum or contract termination.	Implementation of penalties or contract termination or Contract addendum	Implementation of penalties followed by Contract addendum or contract termination.
	What are the constraints of each scenario?	To find out the challenges and benefits of each of these scenarios,	Contract personnel, custodian, and CTMD planner			
	What are the advantages of each scenario?	To find out the benefits and impacts of each existing scenario on problem-solving	Contract personnel, custodian, and CTMD planner			
	What is your best scenario, and how sure are you of the best scenario in percentage?	To measure the confidence level in the selected scenario	Contract personnel, custodian, and CTMD planner	Implementation of penalties, Contract addendum (40)	Implementation of penalties, Contract addendum (40)	Implementation of penalties, Contract addendum (40)
	Who has to approve the chosen scenario?	To know the rote approval in the business process	Contract personnel, custodian, and CTMD planner	The contract committee for addendum & CTM for Implementation of penalties and warnings.	The contract committee for addendum & CTM for Implementation of penalties and warnings.	The contract committee for addendum & CTM for Implementation of penalties and warnings.
	How long does the approval process take?	To find out the required processing time.	Contract personnel, custodian, and	Addendum or change contract => 6 to 8 months if approved directly without revisions or rejections. Warning & penalty immediately.	Addendum or change contract => 6 to 8 months if approved directly without revisions or rejections. Warning & penalty immediately.	Addendum or change contract => 6 to 8 months if approved directly without revisions or rejections. Warning & penalty immediately.

Research Questions	Interview Questions	Objectives description	Target	Finance Department		
				EF	SH	CA
			CTMD planner			
	Is there a similar case with other contractors?	To find out how often this case occurs in the KPC area.	Contract personnel, custodian, and CTMD planner			
	What are the minimum requirements that must be met by contractors if they want to take part in a tender at PTKPC?	To find out the mandatory and minimum requirements for every company that wants to become a PTKPC contractor	Contract personnel, custodian, and CTMD planner			
	From the existing root causes, what preventive actions must we add to the tender procedure?	To explore what items can be improved in the current procedure	Contract personnel, custodian, and CTMD planner			
	Can we immediately implement these preventive actions during the next tender period?	To find out the challenges in implementing the suggested corrective actions	Contract personnel, custodian, and CTMD planner			
	If not, what procedures must we go through to be able to add these preventive actions?	To find out what steps should be taken later in implementing these corrective actions	Contract personnel, custodian, and CTMD planner			

Appendix B Pairwise Comparison

B1. Pairwise comparison of Criteria

1. Interview results of pairwise comparison with KP1

Question:
Which one of the following criteria do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Cost	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Quality
Cost	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Time
Cost	←	9	8	7	6	5	4	3	**2**	1	2	3	4	5	6	7	8	9	→	Contract management
Quality	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Time
Quality	←	9	8	7	6	5	4	3	**2**	1	2	3	4	5	6	7	8	9	→	Contract Management
Time	←	9	8	7	6	5	4	**3**	2	1	2	3	4	5	6	7	8	9	→	Contract Management

2. Interview results of pairwise comparison with KP2

Question:
Which one of the following criteria do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Cost	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Quality
Cost	←	9	8	7	6	5	4	3	**2**	1	2	3	4	5	6	7	8	9	→	Time
Cost	←	9	8	7	6	5	4	3	**2**	1	2	3	4	5	6	7	8	9	→	Contract management
Quality	←	9	8	7	6	5	4	3	**2**	1	2	3	4	5	6	7	8	9	→	Time
Quality	←	9	8	7	6	5	4	3	**2**	1	2	3	4	5	6	7	8	9	→	Contract Management
Time	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract Management

3. Interview results of pairwise comparison with KP3

Question:
Which one of the following criteria do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Cost	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Quality
Cost	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Time
Cost	←	9	8	7	6	5	4	3	**2**	1	2	3	4	5	6	7	8	9	→	Contract management
Quality	←	9	8	7	6	5	4	3	**2**	1	2	3	4	5	6	7	8	9	→	Time
Quality	←	9	8	7	6	5	4	**3**	2	1	2	3	4	5	6	7	8	9	→	Contract Management
Time	←	9	8	7	6	5	**4**	3	2	1	2	3	4	5	6	7	8	9	→	Contract Management

4. Interview results of pairwise comparison with KP4

Question:
Which one of the following criteria do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Cost	←	9	8	7	6	5	4	**3**	2	1	2	3	4	5	6	7	8	9	→	Quality
Cost	←	9	8	7	6	5	**4**	3	2	1	2	3	4	5	6	7	8	9	→	Time
Cost	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract management
Quality	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Time
Quality	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Contract Management
Time	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Contract Management

5. Interview results of pairwise comparison with KP5

Question:
Which one of the following criteria do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Cost	←	9	8	7	6	5	**4**	3	2	1	2	3	4	5	6	7	8	9	→	Quality
Cost	←	9	8	7	6	5	4	**3**	2	1	2	3	4	5	6	7	8	9	→	Time
Cost	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract management
Quality	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Time
Quality	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Contract Management
Time	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Contract Management

B2. Pairwise comparison of Alternatives

1. Interview results of pairwise comparison with KP1.

Question:
Based on the criteria **Cost** which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties

Question:
Based on the criteria **Quality** which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties

Question:
Based on the criteria **Time** which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties

Question:
Based on the criteria of **Contract Management** which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties

2. Interview results of pairwise comparison with KP2.

Question:
Based on the criteria Cost which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	3	**4**	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	3	**4**	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties

Question:
Based on the criteria Quality which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	3	**4**	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties

Question:
Based on the criteria Time which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	3	**4**	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties

Question:
Based on the criteria of Contract Management which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties

3. Interview results of pairwise comparison with KP3.

Question:
Based on the criteria Cost which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	2	3	**4**	5	6	7	8	9	→	Implementation of warning and penalties

Question:
Based on the criteria Quality which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties

Question:
Based on the criteria Time which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	3	**4**	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	3	**4**	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Implementation of warning and penalties

Question:
Based on the criteria of Contract Management which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties

4. Interview results of pairwise comparison with KP4.

Question:
Based on the criteria Cost which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Implementation of warning and penalties

Question:
Based on the criteria Quality which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties

Question:
Based on the criteria Time which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	3	**4**	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	3	**4**	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	3	**4**	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties

Question:
Based on the criteria of Contract Management which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Implementation of warning and penalties

5. Interview results of pairwise comparison with KP5.

Question:
Based on the criteria Cost which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	2	3	**4**	5	6	7	8	9	→	Implementation of warning and penalties

Question:
Based on the criteria Quality which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	2	3	**4**	5	6	7	8	9	→	Implementation of warning and penalties

Question:
Based on the criteria Time which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Implementation of warning and penalties

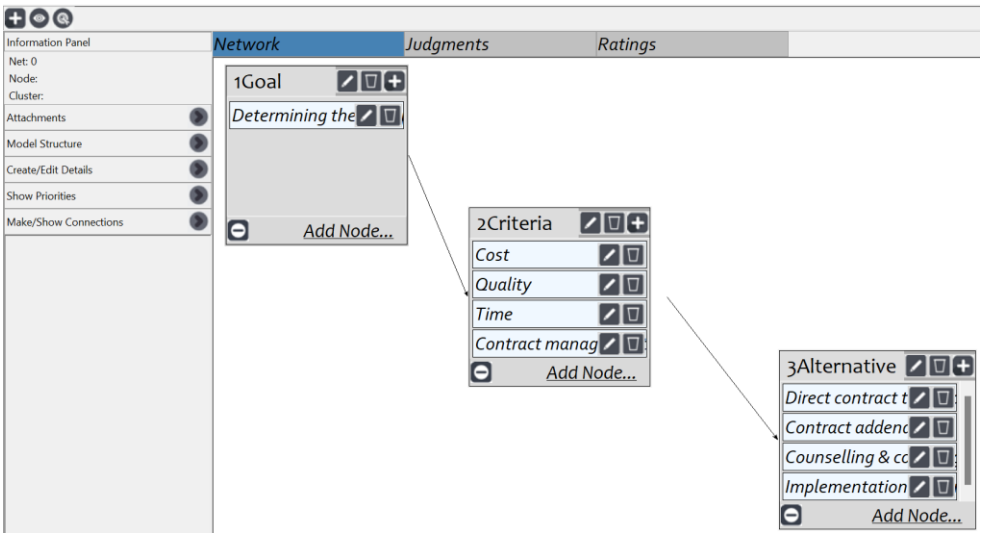
Question:
Based on the criteria of Contract Management which one of the following alternatives do you think is more preferable for solving the issue of PTPB's inability to perform its duties in conveyor maintenance at the coal terminal?

Criteria	←	Pairwise Numerical Rating																	→	Criteria
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Contract addendum
Direct contract termination	←	9	8	7	6	5	4	3	2	**1**	3	3	4	5	6	7	8	9	→	Counselling & coaching
Direct contract termination	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties
Contract addendum	←	9	8	7	6	5	4	3	2	**1**	2	3	4	5	6	7	8	9	→	Counselling & coaching
Contract addendum	←	9	8	7	6	5	4	3	2	1	**2**	3	4	5	6	7	8	9	→	Implementation of warning and penalties
Counselling & coaching	←	9	8	7	6	5	4	3	2	1	2	**3**	4	5	6	7	8	9	→	Implementation of warning and penalties

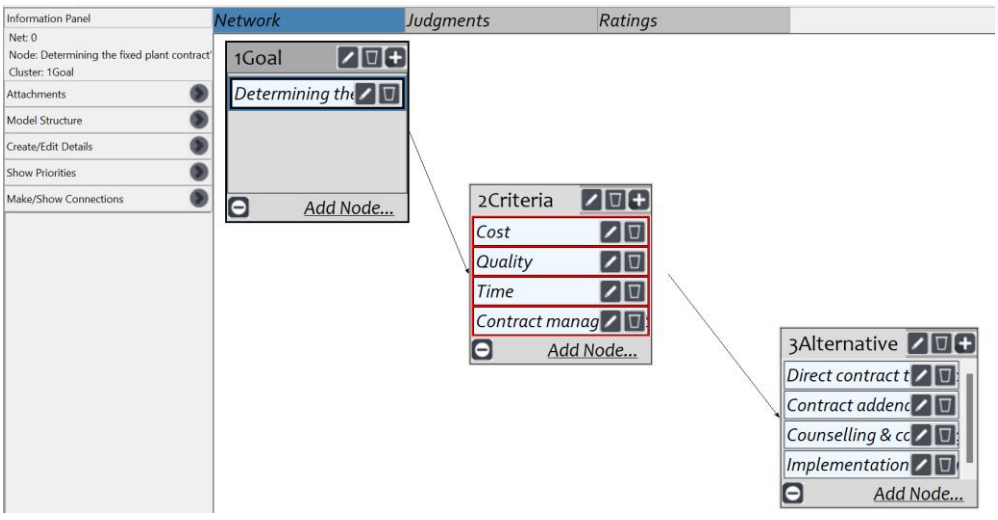
Appendix C Results of Super Decision AHP

1. Create clusters and nodes based on the hierarchy of AHP in Figure 4.11.

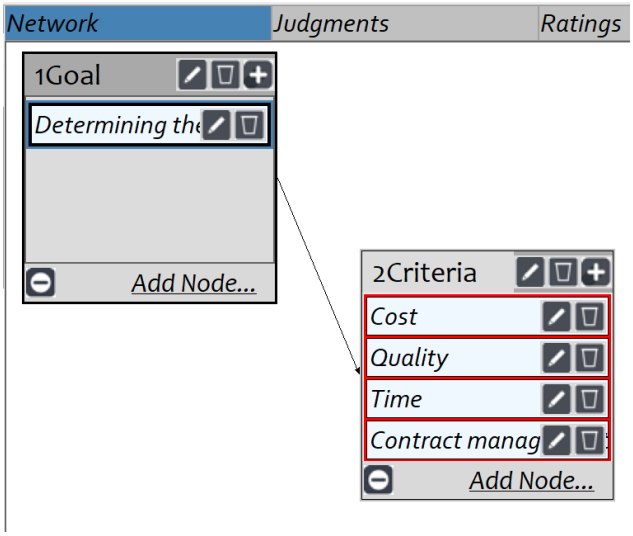
Cluster	Nodes
Goals	Determining the fixed plant contract's maintenance strategy
Criteria	Cost; Quality; Time; Contract management
Alternatives	Direct contract termination; Contract addendum; Counselling & coaching; Implementation of warning and penalties



2. Connect all nodes; connect all nodes that have been created; connect both nodes in cluster goals to cluster criteria; and connect cluster criteria to cluster alternatives.

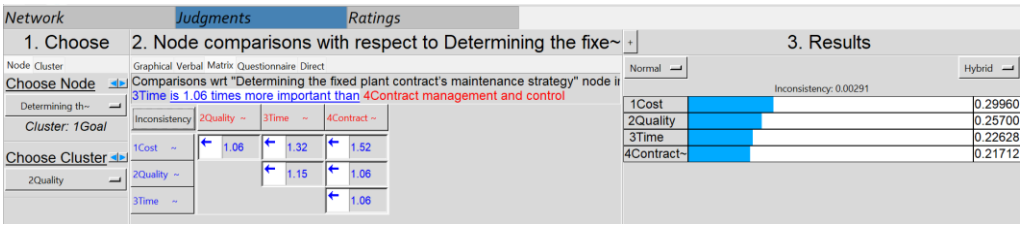


3. Check all connections. If both cluster criteria and cluster alternatives are red, then all nodes are connected.

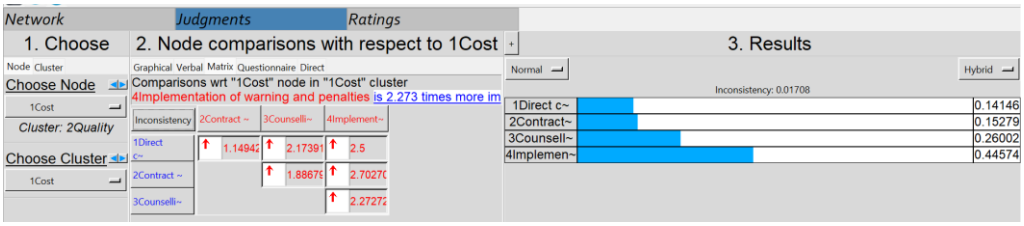


4. Input a judgment or comparison of criteria and/or alternatives.

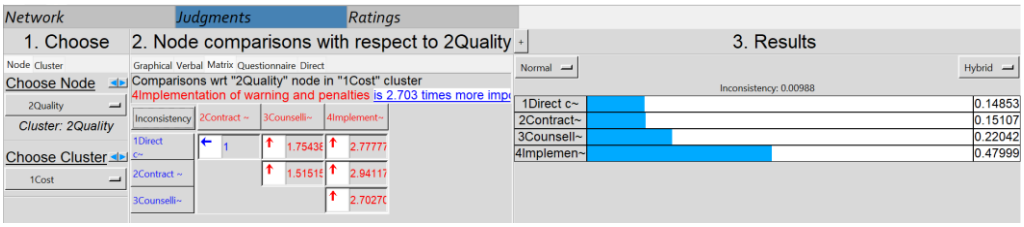
5. Pairwise comparison matrix of "**Criteria**"; enter the values as listed in Table 4.15.



6. Pairwise comparison matrix of "**cost**"; enter the values of cost as listed in Table 4.16.

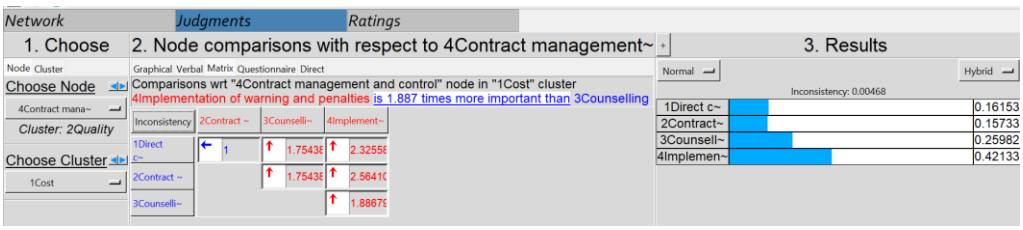


7. Pairwise comparison matrix of "**quality**"; enter the values of cost as listed in Table 4.16.

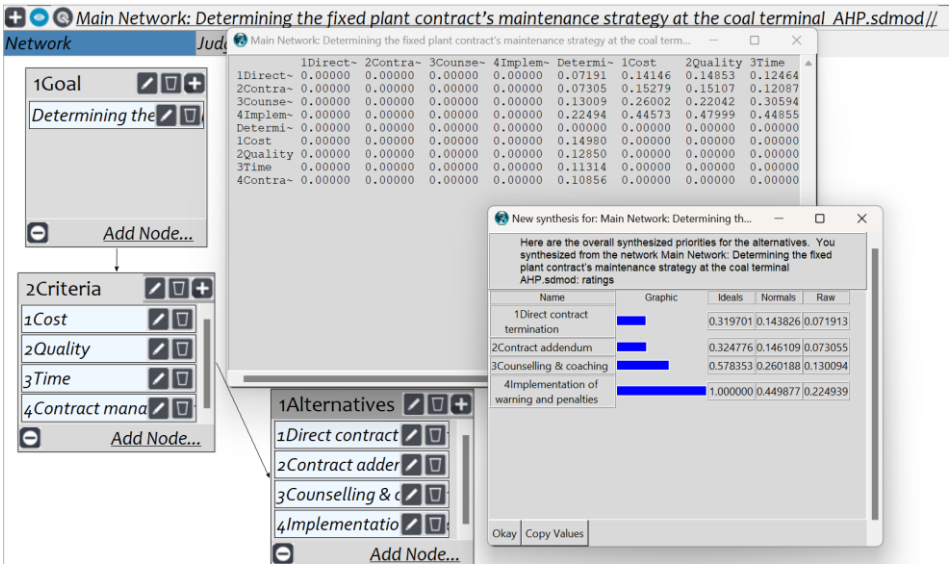


8. Pairwise comparison matrix of "**time**"; enter the values of cost as listed in Table 4.16.

9. Pairwise comparison matrix of "**Implementation of warning and penalties**"; enter the values of cost as listed in Table 4.16

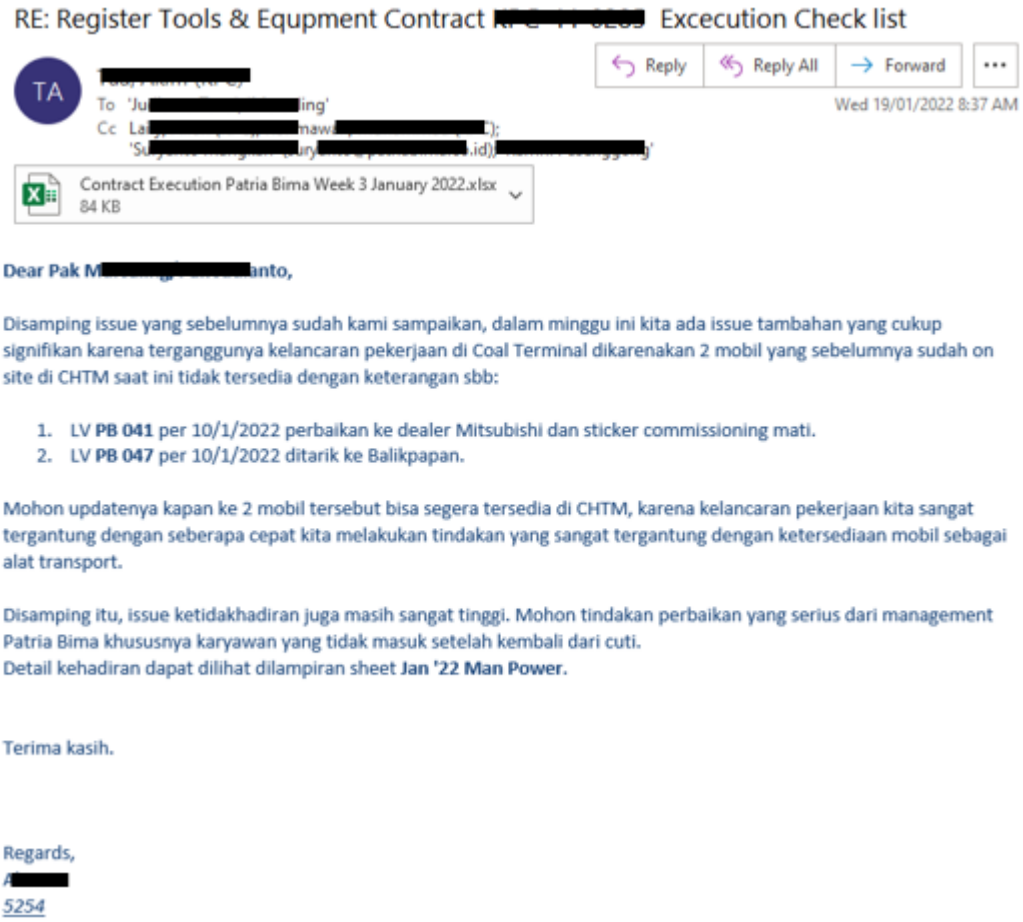


10. Result in prioritized rankings in the Super Decision application.



Appendix D Warning has issued to PTPB.

D1. Reminder and Warning at the beginning of the contract to complete the obligation according to the contract requirements.



RE: Register Tools & Equpment Contract [redacted] Excecution Check list

Reply | Reply All | Forward | ...

TA [redacted]

To 'Ju[redacted]ing'

Cc La[redacted]maw[redacted]);

'Su[redacted].id)[redacted]'

Wed 19/01/2022 8:37 AM

Contract Execution Patria Bima Week 3 January 2022.xlsx
84 KB

Dear Pak M[redacted]nto,

Disamping issue yang sebelumnya sudah kami sampaikan, dalam minggu ini kita ada issue tambahan yang cukup signifikan karena terganggunya kelancaran pekerjaan di Coal Terminal dikarenakan 2 mobil yang sebelumnya sudah on site di CHTM saat ini tidak tersedia dengan keterangan sbb:

1. LV **PB 041** per 10/1/2022 perbaikan ke dealer Mitsubishi dan sticker commissioning mati.
2. LV **PB 047** per 10/1/2022 ditarik ke Balikpapan.

Mohon updatenya kapan ke 2 mobil tersebut bisa segera tersedia di CHTM, karena kelancaran pekerjaan kita sangat tergantung dengan seberapa cepat kita melakukan tindakan yang sangat tergantung dengan ketersediaan mobil sebagai alat transport.

Disamping itu, issue ketidakhadiran juga masih sangat tinggi. Mohon tindakan perbaikan yang serius dari management Patria Bima khususnya karyawan yang tidak masuk setelah kembali dari cuti.
Detail kehadiran dapat dilihat dilampiran sheet **Jan '22 Man Power**.

Terima kasih.

Regards,
A[redacted]
5254

D2. Second Reminder and Warning

TA

T[redacted])

To 'J[redacted]na.c[redacted]';
'S[redacted]n' (sur[redacted]na.co.id)

Cc S[redacted])

Reply | Reply All | Forward

Tue 8/03/2022 2:1

Dear Pak [redacted]na,

Mohon feedback-nya. Agar pekerjaan kita bisa berjalan dengan baik sesuai dengan kontrak yang telah kita sepakati. Berikut klausal terkait hal-hal dibawah yang harapan kami tidak perlu sampai dilakukan.

1. *Sow Point 7 Nomor 7.9 Penalty a.*
2. *SoW Point 7 Nomor 7.10 Penalty a , b, c dan f.*

7.9	Tools and Equipment Maintenance *Peralatan dan Perlengkapan Maintenance* *Bobot/ Weight : 10%*	a. Maintenance shall be done by a Contractor that holds the correct Company CMS Type of Work Approval. *Maintenance harus dikerjakan oleh Kontraktor yang mempunyai Type of Work CMS yang benar sesuai Persetujuan Pekerjaan.* b. Maintenance shall be done by skilled mechanic and proper tools *Maintenance harus dikerjakan dengan mesin/alat yang berkualitas dan alat yang tepat.*	a. The Company may stop the use of improperly maintained plant and equipment at no cost to the Company. Perusahaan dapat menghentikan penggunaan *maintained* plant yang tidak layak dan perlengkapan tanpa ada pemungutan biaya kepada Perusahaan. b. The Company will give warning if the Contractor fails to meet with the Standard. Perusahaan akan memberi peringatan apabila Kontraktor tidak memenuhi standar. c. The Company may, at its sole discretion, terminate the Contract after 3 warning notices by the Company. *Perusahaan, atas kebijakannya sendiri, dapat mengakhiri Kontrak setelah 3 kali peringatan oleh Perusahaan.*
7.10	Manpower Availability *Ketersediaan Tenaga kerja* *Bobot/ Weight : 15%*	a. All personnel shall be trained and has appropriate competency and experiences. *Semua personel harus dilatih dan memiliki kompetensi dan pengalaman yang sesuai.* b. Contractor shall maintain their manpower availability at 100% level. *Kontraktor harus menyediakan dan memelihara ketersediaan tenaga kerja pada level 100%* c. The number of mandatory personnel and their position must be accordance with the contract. *Jumlah personnel wajib dan posisinya harus sesuai dengan jumlah dan posisi yang diminta didalam*	a. The Company reserves the right, at its absolute discretion, to refuse any personnel or equipment who considered unsafe, incompenent or contribute to unsafe performance. *Perusahaan berhak, kebijaksanaan mutlak, untuk menolak setiap personil atau peralatan yang dianggap tidak aman, tidak kompeten atau berkontribusi terhadap kinerja yang tidak aman.* b. For nonavailability < 1 (one) month, the Company will adjust prorate the value of payment from each Manpower with the actual availability, then the actual payment will be (fixed monthly fee of each Manpower – actual unavailability x allowance of availability [such as transport allowance, meal allowance, availability allowance, etc]) *Untuk ketidakhadiran kurang dari 1 bulan, maka Perusahaan akan menyesuaikan prorata nilai pembayaran dari setiap Tenaga Kerja sesuai dengan ketersediaan aktual, kemudian aktual pembayaran menjadi (biaya tetap bulanan dari setiap Tenaga Kerja – ketidakhadiran aktual x tunjangan kehadiran [seperti tunjangan transport, tunjangan makan, tunjangan kehadiran, dsb])*

D3. Previous serious warning letter was issued by the custodian to PTPB.

Sangatta, 13 Februari 2023

Nomor : L001/CPHD-CHTM/II/23
Lampiran : -
Perihal : **Surat Peringatan / Pembinaan**

Kepada,

Bpk. [redacted]

Marketing Commercial PT[redacted]

Balikpapan

Dengan hormat,

Dengan ini kami menyampaikan surat peringatan dan / atau pembinaan kepada PT [redacted] (PB) sehubungan dengan lima hal berikut:

1. Merujuk pada dokumen kontrak [redacted] **Item 5.a PJO (Penanggung Jawab Operasi)**, ***Kontraktor harus menunjuk satu orang karyawan yang memiliki jabatan tertinggi di wilayah kerja pertambangan KPC sebagai PJO yang dibuktikan dengan surat keputusan dari direksi perusahaan. Pegawai yang ditangkat sebagai PJO harus memenuhi kriteria persyaratan sesuai Kepdirjen Minerba No 185.K37.04DJB2019 serta kebijakan dan peraturan KPC***, yang mana mulai awal kontrak 1 Desember 2021 hingga saat ini PB belum bisa memenuhi ketersediaan PJO sesuai kriteria Kepdirjen Minerba.

2. Merujuk pada dokumen kontrak [redacted] **Item 5. b. HSES Regulation, Selama masa kontrak, Kontraktor wajib memenuhi ketentuan HSES berikut ini dalam setiap kegiatan di wilayah kerja pertambangan KPC**, yang mana per 15 Juli 2022 hingga saat ini safety officer PB tidak tersedia yang mengakibatkan beberapa kewajiban HSES PB tidak berjalan sebagaimana mestinya sesuai dokumen kontrak.

3. Merujuk pada dokumen kontrak [redacted] **Item 7.7 Material**, yang mana ketersediaan *splicing kit steel cord Conveyor Belt semenjak Januari 2023 tidak tersedia* yang mengakibatkan terganggunya kegiatan perbaikan conveyor belt yang telah direncanakan.

4. Merujuk pada dokumen kontrak [redacted] **Item 7.5 Waktu tanggap**, yang mana kepemilikan *kimper BUS hanya dimiliki oleh satu orang saja, sehingga ketika pemilik kimper tersebut berhalangan untuk masuk bekerja (cuti,izin,mcu dll)* berdampak terganggunya kegiatan perbaikan conveyor belt untuk bisa selesai dan mulai tepat waktu.

5. Merujuk pada dokumen kontrak **KPC-44-0285 Item 7.9 Peralatan dan Perlengkapan Maintenance**, yang mana pengontrolan masa aktif sticker commissioning kendaraan (LV/BUS) tidak dilakukan dengan baik dimana pengajuan perpanjangan commissioning dilakukan kurang dari 1 minggu sebelum masa sticker yang sebelumnya kadaluarsa. Hal tersebut berdampak tidak tersedianya kendaraan (LV/BUS) sebagaimana mestinya sehingga terganggunya kegiatan perbaikan conveyor belt sesuai dengan yang direncanakan.

Berdasarkan hal tersebut diatas, PB diharapkan dapat menyelesaikan permasalahan tersebut dengan segera. Rencana tindakan perbaikan harus diinformasikan kepada KPC Representative 7 hari setelah diterimanya surat ini, dan realisasi tindak lanjut atas kelima hal tersebut di atas harus diselesaikan paling lambat satu bulan setelah diterimanya surat ini.

Salam,

[redacted]
Contract & Contractor Custodian
Manager CHTM
Coal Processing and Handling Division
DS/af

Tembusan:
1. General Manager CPHD
2. Manager CPPM - CPHD
3. Manager Supply – SCD
4. CPPM Superintendents
5. CHTM Superintendents