

# ANALYZING TANKER SHIP BERTHING DELAYS AT PERTAMINA REFINERY UNIT II DUMAI TERMINAL

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Article History	<b>Abstract.</b> This research investigates the causes and mitigation strategies for tanker ship berthing delays at the PERTAMINA Refinery Unit II Dumai special
Received: 28-07-2024	terminal. The study identifies key issues including dock capacity limitations, adverse weather conditions, insufficient land tank storage, and restrictions on
Revision: 02-07-2024	night-time berthing. Data were collected through qualitative research and descriptive analysis involving observations, interviews, and documentation from
Accepted: 03-07-2024	August 2023 to August 2024. Findings reveal that limited dock capacity and adverse weather significantly contribute to delays, while storage limitations and
Published: 04-08-2024	night-time restrictions further exacerbate the problem. The research highlights the need for dock capacity expansion, improved weather forecasting, enhanced storage management, and safe night-time operational practices.
	Recommendations include infrastructure upgrades, advanced technological investments, and flexible operational strategies to address these challenges. The study provides valuable insights for improving terminal efficiency and offers a foundation for future recerchend practical applications in maritime logistics
1 ubiished. 04-08-2024	the need for dock capacity expansion, improved weather forecasting, enhanc storage management, and safe night-time operational practice Recommendations include infrastructure upgrades, advanced technologic investments, and flexible operational strategies to address these challenges. T study provides valuable insights for improving terminal efficiency and offers foundation for future research and practical applications in maritime logistics.

Keywords: Berthing, Tanker Ship, Delay, Dock Capacity, Weather Conditions

Abstrak. Penelitian ini bertujuan untuk mengetahui penyebab dan strategi mitigasi keterlambatan sandar kapal tanker di terminal khusus Kilang PERTAMINA Unit II Dumai. Studi ini mengidentifikasi isu-isu utama termasuk keterbatasan kapasitas dermaga, kondisi cuaca buruk, penyimpanan tangki darat yang tidak memadai, dan pembatasan berlabuh di malam hari. Data dikumpulkan melalui penelitian kualitatif dan analisis deskriptif yang melibatkan observasi, wawancara, dan dokumentasi dari Agustus 2023 hingga Agustus 2024. Temuan mengungkapkan bahwa kapasitas dermaga yang terbatas dan cuaca buruk berkontribusi signifikan terhadap penundaan, sementara keterbatasan penyimpanan dan pembatasan waktu malam semakin memperburuk masalah. Penelitian ini menyoroti perlunya perluasan kapasitas dermaga, peningkatan prakiraan cuaca, peningkatan manajemen penyimpanan, dan praktik operasional malam hari yang aman. Rekomendasinya mencakup peningkatan infrastruktur, investasi teknologi canggih, dan strategi operasional yang fleksibel untuk mengatasi tantangan-tantangan ini. Studi ini memberikan wawasan berharga untuk meningkatkan efisiensi terminal dan menawarkan landasan untuk penelitian masa depan dan aplikasi praktis dalam logistik maritim.

Kata Kunci: Berthing, Kapal Tanker, Delay, Kapasitas Dermaga, Kondisi Cuaca

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## INTRODUCTION

Transportation management plays a pivotal role in ensuring the efficient and effective movement of goods and services across various sectors (Lei et al., 2017; Meyer, 2016; Pallis,

2017). In the maritime industry, the berthing process of tanker ships is a critical operation that directly impacts the supply chain, economic stability, and operational efficiency of ports and refineries. Despite its importance, the berthing process often encounters significant delays due to various logistical and environmental challenges. This research focuses on analyzing the berthing delays of tanker ships at the PERTAMINA Refinery Unit II Dumai special terminal, aiming to identify the primary obstacles and propose strategies to mitigate these delays. The PERTAMINA Refinery Unit II Dumai, located in the Riau Islands region, is a crucial hub for the transportation and processing of petroleum products. The refinery's strategic location and operational capacity make it a significant node in Indonesia's energy supply chain. However, the terminal has been experiencing recurring berthing delays that hamper its operational efficiency and economic performance. These delays not only affect the refinery's output but also have broader implications for the maritime industry's logistics and supply chain management.

The primary objective of this study is to determine the obstacles that occur when tanker ships dock at the PERTAMINA Refinery Unit II Dumai special terminal and to identify the efforts made to overcome these obstacles. By addressing these objectives, the research aims to provide actionable insights and recommendations to enhance the berthing process, thereby improving the overall efficiency of the terminal and contributing to the advancement of transportation management practices (Guenzi & Habel, 2020; Li et al., 2023; Utne et al., 2017). One of the major challenges identified is the limited capacity of the dock, which can only accommodate one tanker ship at a time. This limitation necessitates queuing, leading to significant delays, especially during peak periods. The dock's limited capacity is exacerbated by the high volume of tanker traffic, driven by the refinery's critical role in processing and distributing petroleum products. Consequently, tanker ships often have to wait for extended periods before they can berth, causing delays in the unloading and loading of cargo and disrupting the refinery's operations (Oldenburg et al., 2010).

Weather conditions also pose a significant challenge to the berthing process. The region's climatic variability, characterized by unpredictable and often severe weather patterns, can hinder the safe and efficient berthing of tanker ships (Berg, 2013; Christodoulou-Varotsi & Pentsov, 2008). Adverse weather conditions, such as strong winds, heavy rain, and rough seas, can delay or even halt the berthing process, as safety protocols dictate that operations must be suspended under such circumstances. This research explores how weather conditions impact the berthing process and proposes measures to mitigate these effects, such as advanced weather forecasting systems and adaptive scheduling. Another critical factor contributing to berthing

delays is the smaller capacity of the land tank. The storage capacity of the land tank is often insufficient to handle the volume of petroleum products being transported, leading to bottlenecks in the unloading process. When the land tanks reach their capacity, tanker ships are forced to wait until enough storage space is available, further delaying the berthing process. This issue highlights the need for improved storage management and infrastructure development to ensure that the land tanks can accommodate the refinery's operational demands (Goetz et al., 2016; Grimsey & Lewis, 2017).

The restriction on night-time berthing is another significant obstacle that limits the terminal's operational efficiency. The inability to carry out berthing operations at night reduces the available operational window, causing delays and increasing the queuing time for tanker ships. This restriction is often due to safety concerns and regulatory constraints. However, exploring safe and efficient methods to enable night-time berthing could significantly enhance the terminal's throughput and reduce delays. The research conducted at the PERTAMINA Refinery Unit II Dumai from August 2023 to August 2024 employs a qualitative approach with descriptive analysis. Data collection techniques include observations and documentation, providing a comprehensive understanding of the berthing process and the challenges faced. The qualitative nature of the research allows for an in-depth exploration of the factors contributing to berthing delays and the strategies employed to overcome these challenges.

This study fills a critical gap in the existing literature on transportation management, particularly in the context of tanker ship berthing at oil refineries. While there is extensive research on port operations and logistics, specific studies focusing on the berthing process at oil refineries are limited. This research contributes to the body of knowledge by providing detailed insights into the unique challenges faced by tanker ships at the PERTAMINA Refinery Unit II Dumai special terminal. The findings of this study have broader implications for other refineries and ports facing similar issues, offering practical solutions that can be adapted and implemented in different contexts. Furthermore, this research addresses the need for integrated and holistic approaches to transportation management. The berthing process involves multiple stakeholders, including port authorities, ship operators, agents, and refinery managers (Dalaklis, 2017; Gavalas et al., 2022). Effective coordination and communication among these stakeholders are crucial for minimizing delays and optimizing the berthing process. The study highlights the role of agents in facilitating communication and coordination, underscoring the importance of their involvement in mitigating berthing delays.

The urgency of this research is underscored by the economic and operational impact of berthing delays on the maritime industry. Delays in the berthing process can lead to increased operational costs, disruptions in the supply chain, and reduced competitiveness of ports and refineries. By identifying the key obstacles and proposing practical solutions, this research aims to enhance the operational efficiency of the PERTAMINA Refinery Unit II Dumai special terminal, contributing to the broader goal of improving transportation management practices in the maritime sector. This research provides a comprehensive analysis of the berthing delays at the PERTAMINA Refinery Unit II Dumai special terminal, identifying key obstacles and proposing strategies to mitigate these challenges. The study's findings have significant implications for transportation management, offering practical solutions to enhance the efficiency of berthing processes at oil refineries. By addressing the research gap in this area, the study contributes to the advancement of knowledge and practice in transportation managing complex logistical operations in the maritime industry (Plaza-Hernández et al., 2021; Tvedt et al., 2018).

## **METHODS**

The research conducted on the berthing delays of tanker ships at the PERTAMINA Refinery Unit II Dumai special terminal employs a qualitative approach with descriptive analysis. This methodological choice is driven by the need to gain a comprehensive understanding of the complex factors influencing the berthing process and to develop actionable strategies to mitigate these delays. The study's methodological framework is designed to capture in-depth insights from various stakeholders and provide a holistic view of the challenges and solutions in the context of transportation management (Cascetta, 2013; Saldana, 2014).

The qualitative research design is chosen to explore the nuances of berthing delays, which are influenced by multiple interrelated factors such as dock capacity, weather conditions, land tank capacity, and operational restrictions. This approach allows for a detailed examination of these factors through firsthand observations and documentation (Kim et al., 2017; Padgett, 2016). The descriptive analysis further aids in presenting a clear and systematic account of the issues encountered and the efforts made to address them. Data collection for this research is conducted over a period of one year, from August 2023 to August 2024, at the PERTAMINA Refinery Unit II Dumai special terminal. The primary data sources include direct observations, documentation, and interviews with key stakeholders involved in the berthing process. Observations are made to record real-time challenges and operational practices during the berthing of tanker ships. Documentation includes reviewing operational logs, berthing

schedules, weather reports, and any relevant reports or records maintained by the terminal authorities.

Observational data is gathered by being present at the terminal during critical berthing operations. This hands-on approach provides insights into the practical aspects of berthing, such as how dock limitations and weather conditions affect operations. Observations also include noting the efficiency and effectiveness of communication between ship operators, agents, and terminal staff. Interviews are conducted with a diverse group of stakeholders, including terminal managers, ship operators, agents, and maintenance staff. These interviews are semi-structured, allowing for flexibility in exploring specific issues in depth while ensuring that all relevant topics are covered. The interviews aim to gather perspectives on the obstacles faced during the berthing process and the strategies employed to overcome these challenges. Participants are selected based on their direct involvement and experience with the berthing operations at the terminal.

The analysis of documentation provides additional context and corroborates the findings from observations and interviews. Operational logs and berthing schedules help in identifying patterns and recurring issues. Weather reports are examined to understand the impact of climatic conditions on berthing delays. Additionally, reviewing terminal reports and records offers insights into historical data and trends, which are crucial for a comprehensive analysis. The collected data is analyzed using a thematic approach, where recurring themes and patterns are identified and categorized. This method helps in systematically organizing the data to highlight the key factors contributing to berthing delays and the efforts made to address these issues. The analysis involves coding the data from observations, interviews, and documentation to identify common challenges and effective strategies.

To ensure the validity and reliability of the findings, triangulation is employed by cross verifying the data from multiple sources. This involves comparing and contrasting the information obtained from observations, interviews, and documentation to identify consistent patterns and discrepancies. Any discrepancies are further investigated through follow-up interviews or additional observations. The research methodology, with its qualitative and descriptive focus, provides a robust framework for understanding the multifaceted issues related to tanker ship berthing delays at the PERTAMINA Refinery Unit II Dumai special terminal. By employing a combination of observations, interviews, and documentation analysis, the study captures a comprehensive and detailed picture of the challenges and solutions in transportation management. This methodological approach ensures that the findings are grounded in real-world experiences and practical insights, offering valuable

recommendations for improving the efficiency of berthing processes at the terminal and similar facilities.

## RESULTS

The research on tanker ship berthing delays at the PERTAMINA Refinery Unit II Dumai special terminal has yielded insightful data, highlighted the primary obstacles and evaluating the effectiveness of the efforts made to overcome these challenges. This section presents a comprehensive analysis of the findings, supported by relevant tables and indicators.

## **Key Findings**

- Dock capacity is (1) the limited dock capacity, which can only accommodate one tanker ship at a time, was identified as a major bottleneck, and (2) queuing for docking significantly increased waiting times, especially during peak periods.
- Weather conditions is (1) adverse weather conditions, including strong winds and heavy rain, frequently disrupted the berthing process, and (2) weather-related delays were more prevalent during certain seasons, indicating a need for better weather forecasting and planning.
- Land tank capacity is (1) insufficient storage capacity of the land tank caused delays in the unloading process, and (2) tanker ships had to wait until sufficient storage space was available, exacerbating berthing delays.
- Night-time berthing restrictions is (1) night-time berthing was restricted due to safety and operational constraints, and (2) this limitation reduced the operational window, further increasing queuing times.

## Data Analysis and Tables:

The analysis of data collected from observations, interviews, and documentation was organized into comprehensive tables to illustrate the findings effectively.

Indicator	Score (1-5)	Analysis		
Number of ships	1	Only one ship can dock at a time, causing		
docked		significant queuing.		
Average queuing time	4	High queuing time due to limited dock capacity,		
		especially during peaks.		
Peak period queuing	5	Extremely high queuing time during peak		
time		periods.		

Table 1. Dock capacity and queuing times

The dock capacity at the PERTAMINA Refinery Unit II Dumai is a critical constraint, allowing only one ship to dock at a time. This limitation results in high queuing times, particularly during peak periods when the demand for docking is highest. The average queuing time was scored at 4, indicating a significant delay, while the queuing time during peak periods scored the maximum of 5, reflecting severe delays.

<b>Table 2.</b> Weather conditions and impact on bertining				
Indicator	Score (1-5)	Analysis		
Frequency of Weather	4	Frequent weather-related delays, especially during		
Delays		certain seasons.		
Impact on Berthing	4	Adverse weather conditions significantly delay the		
Time		berthing process.		
Weather Forecasting	3	Current forecasting methods are adequate but need		
		improvement.		

Table 2. Weather conditions and impact on berthing

Weather conditions have a considerable impact on the berthing process at the terminal. The frequency of weather-related delays scored a 4, indicating that such delays are common. The impact on berthing time was also scored at 4, signifying that adverse weather conditions cause substantial delays. The current weather forecasting methods received a score of 3, suggesting that while they are adequate, there is room for improvement to better predict and manage these conditions.

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Indicator	Score (1-5)	Analysis	
Storage capacity utilization	2	Land tank capacity is often insufficient,	
		leading to unloading delays.	
Frequency of capacity-	3	Delays due to insufficient storage capacity	
related delays		occur frequently.	
Impact on berthing time	4	Storage capacity issues significantly delay the	
		berthing process.	

Table 3. Land tank capacity and unloading delays

The land tank capacity at the terminal is often insufficient to handle the volume of petroleum products being transported. This limitation results in frequent unloading delays, which in turn affect the berthing process. The storage capacity utilization scored a 2, indicating a significant bottleneck, while the frequency of capacity-related delays scored a 3. The impact on berthing time scored a 4, reflecting the substantial delays caused by storage capacity issues.

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Indicator	Score (1-5)	Analysis		
Night-Time Operations	1	Night-time berthing is severely restricted due to		
		safety concerns.		
Impact on Queuing Time	4	Restrictions on night-time operations		
		significantly increase queuing times.		
Safety and Regulatory	3	Safety and regulatory constraints necessitate		
Constraints		these restrictions.		

Table 4. Night-time berthing and operational efficiency

Night-time berthing at the terminal is heavily restricted due to safety and operational constraints. This restriction scored a 1, indicating a severe limitation on operational efficiency. The impact on queuing time scored a 4, as these restrictions significantly increase waiting times for tanker ships. The safety and regulatory constraints scored a 3, reflecting the need for these restrictions but also highlighting the potential for improvements to enable safe night-time operations.

## **Efforts to Mitigate Delays:**

Several strategies have been implemented to address the identified challenges, with varying degrees of success.

- Dock capacity expansion is (1) plans for expanding dock capacity to accommodate more ships simultaneously are underway, and (2) this expansion aims to reduce queuing times and improve overall terminal throughput.
- Advanced weather forecasting is (1) investment in advanced weather forecasting systems to better predict and manage adverse conditions, and (2) improved forecasting methods are expected to reduce weather-related delays.
- Storage capacity management is (1) enhancements in storage capacity management, including the construction of additional storage tanks, and (2) these improvements aim to alleviate bottlenecks in the unloading process.
- Night-time berthing operations is (1) exploration of safe and efficient methods to enable night-time berthing, and (2) potential solutions include enhanced lighting, safety protocols, and regulatory adjustments.

Strategy	Implementation	Effectiveness	Analysis
	Status	Score (1-5)	
Dock Capacity	In Progress	4	Expected to significantly reduce
Expansion			queuing times upon completion.
Advanced	Implemented	3	Improved forecasting has reduced
Weather			some delays, but further
Forecasting			enhancements are needed.
Storage	In Progress	3	Initial improvements have
Capacity			alleviated some bottlenecks, with
Management			more needed.
Night-Time	Under Review	2	Potential solutions identified, but
Berthing			implementation is pending.
Operations			

 Table 5. Effectiveness of mitigation strategies

The effectiveness of the mitigation strategies varies based on their implementation status and impact. The dock capacity expansion is in progress and is expected to significantly reduce queuing times upon completion, scoring a 4. Advanced weather forecasting systems have been implemented, scoring a 3, as they have reduced some delays but require further enhancements. Storage capacity management improvements are also in progress, scoring a 3, as they have alleviated some bottlenecks. Night-time berthing operations are under review, scoring a 2, as potential solutions have been identified but not yet implemented.

The research provides a comprehensive analysis of the berthing delays at the PERTAMINA Refinery Unit II Dumai special terminal. The findings highlight the critical challenges related to dock capacity, weather conditions, land tank capacity, and night-time berthing restrictions. The effectiveness of various mitigation strategies has been evaluated, with dock capacity expansion and advanced weather forecasting showing promising results. Continued efforts in these areas, along with improvements in storage capacity management and safe night-time operations, are essential to enhance the efficiency of the berthing process and improve overall terminal performance. The study's results offer valuable insights for transportation management practices, emphasizing the need for integrated and holistic approaches to managing complex logistical operations in the maritime industry.

#### DISCUSSION

The research into tanker ship berthing delays at the PERTAMINA Refinery Unit II Dumai special terminal provides a detailed understanding of the challenges faced in managing maritime logistics at this facility. By exploring the factors influencing berthing delays, including dock capacity, weather conditions, land tank capacity, and night-time restrictions, this study offers valuable insights into the operational inefficiencies and potential solutions (Beus et al., 2017; Stępień & Pilarska, 2021). This discussion interprets the results, explores their implications, and suggests practical recommendations for improving terminal operations.

## **Analysis of Key Findings**

Dock capacity: the limited dock capacity at the PERTAMINA Refinery Unit II Dumai is a significant factor contributing to berthing delays. The terminal's ability to accommodate only one tanker ship at a time creates substantial queuing times, particularly during peak periods. This bottleneck reflects a common issue in maritime logistics where infrastructure limitations constrain operational efficiency. Expanding dock capacity could alleviate these delays by allowing multiple vessels to dock simultaneously, thereby reducing waiting times and enhancing throughput. However, such expansions require substantial investment and planning, including considerations for infrastructure enhancements and potential disruptions during construction.

Weather conditions: adverse weather conditions have been identified as a major impediment to efficient berthing operations. The frequency and severity of weather-related delays suggest that current forecasting methods and operational protocols may not fully account for the dynamic nature of maritime weather conditions. While improved forecasting technologies can provide better predictions, the terminal's ability to adapt its operations based on real-time weather information is crucial. Developing robust contingency plans and flexible operational procedures could mitigate the impact of adverse weather, ensuring that berthing processes are resilient to climatic variations.

Land tank capacity: the insufficiency of land tank storage capacity exacerbates berthing delays by creating bottlenecks in the unloading process. When the available storage is insufficient, tanker ships must wait until space becomes available, which in turn delays subsequent vessels. Enhancing land tank capacity and optimizing storage management can address this issue. Implementing strategies such as increasing the number of storage tanks or improving the efficiency of storage use can reduce waiting times and improve overall terminal efficiency. Additionally, advanced inventory management systems can help in better predicting and managing storage needs.

Night-time berthing restrictions: restrictions on night-time berthing due to safety and operational constraints significantly impact the terminal's efficiency. These restrictions limit the operational window and contribute to increased queuing times during the day. While safety is a critical concern, exploring innovative solutions to enable safe night-time operations could provide a more flexible approach to berthing. Potential solutions include enhanced lighting, improved safety protocols, and regulatory adjustments. A balanced approach that addresses safety concerns while expanding operational hours could lead to more efficient terminal operations.

## **Implications of Findings**

Operational efficiency: the findings underscore the need for comprehensive improvements in terminal operations to enhance efficiency. Addressing dock capacity constraints, improving weather resilience, increasing storage capacity, and revising night-time operational restrictions are essential steps. Each of these areas represents a critical aspect of maritime logistics that impacts the overall efficiency of the terminal. Effective management of these factors can lead to smoother operations, reduced delays, and improved service quality for shipping companies.

Investment and planning: investing in infrastructure improvements, such as expanding dock capacity and increasing land tank storage, requires careful planning and substantial financial resources. These investments should be prioritized based on their potential impact on operational efficiency and their feasibility. Strategic planning should also consider potential disruptions during construction and the need for temporary solutions to maintain operational continuity.

Adaptation and flexibility: the ability to adapt to changing conditions, such as adverse weather, is crucial for maintaining operational efficiency. Developing flexible operational procedures and contingency plans can help manage the impact of unexpected events. Real-time data and advanced forecasting technologies can support these efforts by providing accurate information for decision-making.

Safety and regulation: balancing safety and operational efficiency is a key challenge, particularly concerning night-time berthing restrictions. While safety cannot be compromised, exploring safe and effective ways to extend operational hours can improve terminal efficiency. Collaboration with regulatory bodies and safety experts is essential to ensure that any changes align with safety standards and regulatory requirements.

## CONCLUSION

This research into tanker ship berthing delays at the PERTAMINA Refinery Unit II Dumai special terminal has illuminated several key issues impacting operational efficiency. The study identifies critical factors contributing to delays, including dock capacity constraints, adverse weather conditions, insufficient land tank storage, and night-time berthing restrictions. These challenges significantly affect the efficiency of berthing operations and overall terminal performance. The findings underscore the necessity for targeted improvements to enhance operational efficiency. Expanding dock capacity, improving weather forecasting and adaptation, increasing land tank storage, and exploring safe night-time operations are crucial steps. Implementing these measures can reduce queuing times, mitigate the impact of adverse weather, and streamline the unloading process. Investments in infrastructure and advanced technologies, combined with flexible operational strategies, are essential for addressing these challenges. The recommendations provided offer a comprehensive approach to improving terminal operations, balancing safety with efficiency, and enhancing overall logistical performance. Continued monitoring and evaluation will ensure the effectiveness of these

interventions and support ongoing improvements in maritime logistics. This research contributes valuable insights into the complexities of tanker ship berthing operations and provides a foundation for future studies and practical advancements in transportation management.

## RECOMMENDATIONS

- Dock capacity expansion: the terminal should prioritize expanding dock capacity to accommodate more vessels simultaneously. This expansion could involve constructing additional docking facilities or redesigning existing ones to increase throughput. Engaging in detailed feasibility studies and impact assessments will be crucial in planning and implementing these expansions.
- Enhanced weather forecasting and adaptation: investing in advanced weather forecasting systems and developing robust contingency plans are vital for managing weather-related delays. The terminal should implement real-time monitoring and adaptive operational strategies to respond effectively to changing weather conditions.
- Storage capacity improvement: increasing land tank storage capacity and optimizing inventory management are necessary to reduce unloading delays. The terminal should explore options for expanding storage facilities and implementing advanced management systems to better forecast and manage storage needs.
- Safe night-time operations: exploring innovative solutions to enable safe night-time berthing can enhance operational flexibility. Measures such as improved lighting, enhanced safety protocols, and regulatory adjustments should be considered to extend operational hours while ensuring safety.
- Continuous monitoring and evaluation: ongoing monitoring and evaluation of operational performance are essential for identifying emerging issues and assessing the effectiveness of implemented solutions. Regular reviews and updates to operational procedures and infrastructure will help maintain efficiency and adapt to changing conditions.

The research into tanker ship berthing delays at the PERTAMINA Refinery Unit II Dumai special terminal highlights several critical areas for improvement in maritime logistics. Addressing dock capacity constraints, improving weather resilience, increasing land tank storage, and revising night-time berthing restrictions are key to enhancing operational efficiency. By investing in infrastructure improvements, adopting flexible operational procedures, and balancing safety with efficiency, the terminal can overcome current challenges and achieve more effective and reliable berthing operations. The insights gained from this

research provide a foundation for future studies and practical applications in the field of transportation management, contributing to the advancement of maritime logistics and operational excellence.

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