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Impact of Tide of Times Which Effects Berthing Window Delays at Port of Dwikora Pontianak on Ship PT. Tanto Intim Line

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Abstract: The purpose of the study is to find out how the tide of times impacts Berthing Window delays at Port of Dwikora on PT. TANTO INTIM LINE. The research was conducted at PT. Tanto Intim Line using descriptive qualitative, and descriptive methods. Data was collected through field observations and literature studies. The results showed that the tide of times has been affected by berthing window delays at Port of Dwikora Pontianak. Tide of Times Impacting ships to berth delays and raised some risks faced by the company, such as losing time of berth window, loading cancellation, and also costs that can arise due to container stacking at the Port of Dwikora Pontianak. Due to the high risks faced by the company, there were still a ship that were not ready to berth because of trouble during sailing time and the coordinator's lack of understanding regarding the impact of tide of times which effects ship delayed to berth at Port of Dwikora Pontianak.

Keyword: Tidal Times, Berthing Window, Delays

INTRODUCTION

Maritime transportation plays a strategic role in supporting national logistics connectivity, particularly in an archipelagic country such as Indonesia. The reliability of vessel schedules is essential because delays at one port may affect cargo distribution, terminal productivity, operational costs, and service reliability for logistics users. In port operations, the berthing window system is applied to regulate the allocation of vessel berthing time so that loading and unloading activities can be conducted in a more orderly, efficient, and coordinated manner (van der Steeg et al., 2023).

However, the effectiveness of a berthing window is not only determined by terminal readiness and vessel scheduling, but also by natural conditions, particularly in ports located along river channels. Dwikora Port in Pontianak is one of the ports whose shipping operations are strongly influenced by the tidal dynamics of the Kapuas River. The tidal condition in this area may affect the depth of the navigation channel, thereby influencing vessel arrival, departure, and berthing activities. As a result, shipping companies must carefully adjust vessel movements to tidal windows that are considered safe for navigation (Anjarwati et al., 2023).

This issue is particularly relevant for vessels operating on the Jakarta–Pontianak route. Although PT XYZ has obtained scheduled berthing window allocations at Dwikora Port, its vessels still face the risk of arrival delays and missed berthing schedules. These delays may be caused by tidal conditions, terminal congestion, container accumulation, and the limited flexibility of port operational schedules. The consequences are not limited to postponed berthing activities, but may also include cargo cancellation, additional operational costs, demurrage charges, and disruption to the overall effectiveness of vessel operations. Based on the research data, several cases of loaded and empty container cancellations occurred throughout 2023, indicating that berthing window delays can generate both operational and financial impacts for shipping companies (Zhen et al., 2017).

Although previous studies have widely discussed berth allocation optimization, port call efficiency, and vessel scheduling, studies that specifically examine the impact of tidal conditions on berthing window delays in Indonesian river ports remain limited (GIA, 2020). This gap is important because river ports require more complex operational planning due to fluctuating water levels and navigation constraints. Therefore, this study aims to analyze how tidal timing affects berthing window delays at Dwikora Port Pontianak and how such delays influence the operational effectiveness of vessels on the Jakarta–Pontianak route. The findings are expected to provide practical recommendations for shipping companies, terminal operators, and port authorities in improving berth planning accuracy, minimizing delay risks, and reducing operational losses caused by the mismatch between vessel schedules and tidal conditions.

METHOD

This study employs a qualitative research method to examine the impact of tidal timing on berthing window delays at Dwikora Port Pontianak. The research object is PT Ganendra Catra Sakti, located at Jl. Teuku Umar, Pontianak Mall Complex Block a No. 18–19, which serves as the ship agency company handling PT Tanto Intim Line vessels operating on the Jakarta–Pontianak route. The research population includes parties directly involved in vessel operations and berthing window management, consisting of ship crews, shipping company employees, ship agents, container terminal operators, and external port operational officers. These informants were selected because they have direct knowledge and practical experience related to vessel arrival, navigation through the Kapuas River, tidal constraints, berth scheduling, cargo handling, and operational coordination at Dwikora Port.

Data were collected through field observation, interviews, and documentation. The researcher directly observed the vessel movement process from the Outer Bar area to the Kapuas River channel and until the vessel berthed at Dwikora Port. During the observation, the researcher recorded vessel time reports, including arrival time at the Outer Bar, river channel entry, and actual berthing time. Supporting documents, such as vessel arrival schedules and tidal forecast data for the Kapuas River, were also used to strengthen the analysis. The data were analyzed using the interactive model of Miles and Huberman, which consists of data reduction, data display, and conclusion drawing or verification. To ensure data validity, this study applied source triangulation and technique triangulation by comparing interview results with field observations and relevant documents. Through this process, the study produced a credible understanding of how tidal conditions contribute to vessel delays and affect the effectiveness of berthing window implementation at Dwikora Port Pontianak.

RESULTS AND DISCUSSION

Operational Context of the Berthing Window at Dwikora Port Pontianak

The findings indicate that the implementation of the berthing window at Dwikora Port Pontianak serves as an important instrument in regulating vessel arrivals, berthing activities, and loading and unloading operations. In the context of the Jakarta–Pontianak route, PT Tanto Intim Line vessels receive scheduled berthing window allocations three times a week, with a

berthing duration of approximately 30 to 32 hours at designated berths. This time allocation shows that the berthing window system functions not only as an administrative schedule, but also as an operational control mechanism to ensure that berth utilization, cargo handling facilities, and vessel movements can be managed in a more orderly and efficient manner. The research data also show that PT Tanto Intim Line is one of the shipping lines with a significant throughput and ship call contract in Pontianak; therefore, vessel arrival punctuality becomes an important factor in maintaining the smooth flow of shipping services and container distribution.

Conceptually, this finding is consistent with studies on berth planning, which explain that vessel berthing planning is the process of determining the time and location of vessels at the berth to support loading and unloading activities optimally. When the berthing schedule is disrupted, the disruption may affect berth utilization, vessel waiting time, and terminal productivity. Studies on berth planning also emphasize that operational disruptions require schedule recovery mechanisms to prevent delays from spreading to subsequent vessels or schedules(van der Steeg et al., 2023). Therefore, the berthing window at Dwikora Port Pontianak can be understood as a time control system that strongly depends on the synchronization of vessel schedules, berth readiness, cargo readiness, and navigational conditions.

Tidal Conditions of the Kapuas River as a Limiting Factor in Vessel Operations

The main findings of the study show that the tidal conditions of the Kapuas River are one of the dominant factors influencing vessel delays toward Dwikora Port Pontianak. Vessels entering the Kapuas River channel cannot fully operate based solely on regular sailing schedules, but must also consider water depth, tidal timing, and safe navigational conditions before entering the channel. This condition becomes more complex because the Kapuas River has tidal characteristics that may change within certain periods. As a result, vessels must adjust their arrival time at the estuary area or Outer Bar before continuing their voyage to the port. The research data indicate that the Kapuas River channel is influenced by a mixed, predominantly semidiurnal tidal pattern, which allows two high tides and two low tides to occur within one day, with varying water levels.

This condition strengthens the understanding that river ports have different operational characteristics compared to open seaports. In ports influenced by tides, vessels must adjust their arrival and departure schedules according to the tidal window, which refers to the time interval when the water depth allows vessels to navigate safely. Zhen et al., (2017) explain that in tidal ports, daily berth planning needs to consider the combination of berth schedules, quay crane allocation, tidal windows, and channel traffic control. This is relevant to the case of Dwikora Port Pontianak because vessel delays are not only caused by managerial factors, but also by natural constraints, such as river channel depth and tidal fluctuations.

Vessel Delays and the Loss of Berthing Window

The findings show that vessel delays in entering Dwikora Port Pontianak may cause vessels to lose their allocated berthing window. When a vessel cannot arrive according to schedule because it has to wait for the tide or because the channel is not yet safe to navigate, the previously allocated berthing schedule may shift. This shift has the potential to disrupt the vessel service sequence, extend waiting time, and create inefficiencies in berth utilization. In the operational context of PT Tanto Intim Line, such delays become a critical issue because vessels on the Jakarta–Pontianak route have regular port call schedules that are closely connected to cargo schedules, container readiness, and subsequent departure schedules.

This finding is consistent with the literature on vessel scheduling and berth allocation, which shows that vessel delays may create a chain effect on berthing schedules and terminal services. Jiang et al., (2022) explain that vessel scheduling in ports with limited channels needs to consider the relationship between navigation channel schedules and berth allocation, as both

influence port operational efficiency. In addition, the concept of Just-in-Time Arrival, developed within the context of port call optimization, emphasizes that vessels should ideally arrive when berth availability, fairway access, and nautical services can be ensured (GIA, 2020). In the case of Dwikora Port Pontianak, this principle is highly relevant because delays caused by tidal conditions can be minimized if information regarding channel conditions, tidal schedules, and berth readiness is integrated more accurately.

The Impact of Delays on Cargo Cancellation, Demurrage, and Operational Efficiency

Vessel delays that lead to the loss of the berthing window affect not only the berthing schedule, but also the financial and operational aspects of shipping companies. The research data show 30 cases of loaded container cargo cancellation and 107 cases of empty container cargo cancellation throughout 2023. This condition indicates that vessel delays may affect cargo readiness, delivery schedule certainty, and the relationship between shipping companies, service users, and terminal operators. In addition, delays may also create additional costs in the form of demurrage, which refers to costs arising from the use of vessels or facilities beyond the agreed time.

From the perspective of port management, vessel delays may create pressure on terminal capacity, particularly when container accumulation occurs and when vessel schedules do not align with terminal operational readiness. Duan et al., (2026) explain that the flow of vessels entering and leaving a port may become a bottleneck when navigation infrastructure, hydrological conditions, and vessel services are not planned in an integrated manner. Therefore, delays caused by tidal conditions at Dwikora Port Pontianak should not be understood merely as a technical vessel issue, but also as a systemic issue involving coordination among vessels, shipping agents, terminals, port authorities, and service users.

The Role of Stakeholder Coordination in Reducing Delay Risks

The findings also show that coordination among stakeholders is an important factor in reducing the risk of berthing window delays. The parties involved in vessel operations include ship crews, shipping companies, ship agents, terminal operators, and port operational officers. Each party has a different role, yet these roles are interconnected in determining the success of vessel arrival, channel entry, berthing, loading and unloading activities, and departure according to schedule (GIA, 2020). If coordination is not conducted in real time, information regarding tidal changes, vessel queues, berth readiness, and cargo readiness may be received late by the parties that need it.

This finding is supported by the concept of port call optimization, which emphasizes the importance of timely information exchange between vessels and ports. The IMO explains that the success of Just-in-Time Arrival depends on the certainty of berth availability, fairway access, and nautical services, such as pilotage, tugboat assistance, and mooring services. In addition, port call optimization guidelines emphasize that vessel arrival efficiency can be improved through information synchronization, waiting time reduction, and vessel speed adjustment based on port readiness. Therefore, in the case of Dwikora Port Pontianak, improving coordination based on tidal data and berthing window schedules is essential to reduce operational uncertainty.

CONCLUSION

Based on the findings, this study concludes that berthing window delays at Dwikora Port Pontianak are strongly influenced by the tidal conditions of the Kapuas River. The fluctuating water level affects the navigability of the river channel, requiring vessels to adjust their arrival time at the Outer Bar before entering the port area. This condition shows that the implementation of the berthing window system in river-based ports cannot rely solely on fixed

schedules, but must also consider natural constraints, particularly tidal windows and channel depth.

The study also shows that vessel delays may cause the loss of allocated berthing windows, which subsequently affects loading and unloading activities, container readiness, vessel waiting time, and overall operational efficiency. In the case of PT Tanto Intim Line vessels handled by PT Ganendra Catra Sakti, delays on the Jakarta–Pontianak route may lead to cargo cancellation, potential demurrage costs, and disruption to coordination among shipping companies, agents, terminal operators, and port authorities. Therefore, berthing window delays should be understood not only as a technical navigation issue, but also as an operational and managerial problem that involves multiple stakeholders.

Overall, improving the effectiveness of the berthing window system at Dwikora Port requires more accurate tidal forecasting, better integration of vessel time reports, and real-time coordination among all parties involved in port operations. By strengthening planning and communication based on tidal data and berth readiness, shipping companies and port operators can reduce uncertainty, minimize vessel waiting time, and improve the reliability of maritime logistics services on the Jakarta–Pontianak route.

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