

EVALUATION OF GOVERNMENT PIONEER VESSEL PROCUREMENT (2015-2019): DELAYS, RISK FACTORS, AND COMPLIANCE

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Abstract

Delays in the construction and handover of government-procured pioneer vessels have posed significant challenges to timely maritime service delivery in Indonesia. Several previous studies have discussed delays in the shipbuilding process by both private companies and state-owned enterprises, but none have discussed the evaluation of delays in the construction of pioneer vessels procured by the government. Therefore, the objective of this study is to assess the government's procurement of pioneer ships from 2015 to 2019. This will ensure that the ship's production process and operation remain compliant with technical specifications and quality standards, enabling it to continue providing passenger and goods services. In addition, it can provide recommendations for risk mitigation to improve the procurement system and supervision of ship construction. Data was taken from 8 ship units (out of a total of 90 units) that, by the end of 2020, had not been handed over and/or operated by ship operators, including seven pioneer ships and one 100-TEU container ship. The study's findings reveal that the assessment of ship procurement encompasses four shipyards, the evaluation of procurement documents, the assessment of development supervision, the assessment of shipyard conditions, the assessment of financial status, and the completion of a ship condition survey. Meanwhile, the main factors causing delays in the ship construction process include financial management (very high), workforce (high), shipyard facilities (high), and Ship Component Certification by the Indonesian Classification Bureau (high). We expect the results of this study to inform the Directorate of Sea Traffic's policies and decisions regarding the continued construction of delayed ships and to serve as a reference for planning the ships construction built between 2015 and 2019.

Keywords: Evaluation, Government procurement, Pioneer vessel.

1. Introduction

The advancement of marine infrastructure and connectivity is a fundamental component in establishing Indonesia as the global maritime axis. To enhance maritime connectivity, the demand for national vessels during a five-year period (2015-2019) under the sea toll program initiated by President Joko Widodo of Indonesia amounted to 1,574 units. National shipyards execute ship construction in this instance through a tendering process. National shipyards execute the tender procedure by using administrative, technical, and financial criteria as benchmarks for evaluation. These metrics assist job owners in identifying suitable partners that align with the established criteria. The thoroughness of ascertaining characteristics for shipyard selection is a crucial component in influencing the task completion process.

The selected shipyard will execute the work in accordance with the stipulations outlined in the contract, including design, specifications, and bill of quantities. During the shipbuilding phase, the shipyard is the primary determinant in achieving the objective of completing the vessel in alignment with the stipulated technical requirements, performance criteria, budget, and timeline. Multiple internal strategic elements influence the shipyard's performance, specifically: shipyard management, resource availability (both people and equipment), and financial considerations of the organization. Externally, various strategic factors exist, including the quality and standards of materials, shipbuilding orders, and worldwide challenges and policies within the maritime sector. The project owner is aided by the supervisory consultant across several work scopes to ensure that the ship's construction adheres to the agreed terms and is finished punctually.

The shipbuilding process may not always proceed as planned, as there is a constant possibility of delays in the vessel's completion [1]. This is highly damaging to stakeholders [2]. Ship owners are unable to run vessels (via operators), while shipyards face increased expenses and penalties for delays and may be unable to construct further ships due to constraints in land, capital, and resources [3]. There are many things that can cause delays in shipbuilding, such as the terms of the contract, how ready the basic design and key plan drawings are, how clear the information and specifications are, how quickly the materials and equipment are bought, how many workers, facilities, and production processes are available, and how much money is available [4, 5].

According to the latest data from the Directorate General of Sea Transportation, Ministry of Transportation, by mid-2020, eight vessels which had been procured since 2015 as part of Indonesia's maritime infrastructure program had not been delivered or operated. This raises significant concerns about oversight, procurement inefficiencies, and project management accountability in public-sector shipbuilding.

Therefore, this study aims to evaluate the progress and outcomes of ship procurement projects from 2015 to 2019, identify the root causes of delays, and provide recommendations for improving oversight and risk mitigation. This will allow the ships to keep being used for passenger and cargo services, which would be a first in maritime transportation. Additionally, the study should offer recommendations for risk mitigation to enhance the procurement system and oversight of ship construction.

The goal of this study is to bring together the results of the ship procurement assessment that was done from 2015 to 2019. The study will focus on the progress made in shipbuilding, the quality of the results, and the use of the vessels. Another purpose is to assess ship procurement and address any issues, including delays and operator ambiguity. Addressing these procurement and construction challenges is essential for realizing Indonesia's vision as a global maritime axis and ensuring equitable transportation access to remote regions.

2. Methods

2.1. Data collection methods

This study employed both primary and secondary data collection techniques. Primary data was collected through field observations, structured interviews, and questionnaires. Observational data included the current physical condition of ships, construction progress, and operational status. Questionnaires targeted shipyards and supervisory consultants to capture challenges and delays in the shipbuilding process. Secondary data was gathered from the Directorate General of Sea Transportation, the Procurement Service Unit Working Group, shipyards, and supervisory consultants. Data included procurement documentation, technical specifications, progress reports, and supervisory evaluations.

2.2. Object of the study

The objects of this study are eight vessels procured by the Indonesian government between 2015 and 2019 but not delivered or operated as of mid-2020. These include seven pioneer ships and one 100-TEU container ship constructed at four national shipyards: PT. Steadfast Marine (Pontianak), PT. Dok dan Perkapalan Kodja Bahari (Jakarta), PT. Prakriti Hasta Darma, and PT. Krakatau Shipyard. These shipyards were selected based on their contractual responsibility for the delayed vessels.

2.3. Analysis of new ship construction

The second analysis pertains to new shipbuilding. Fundamentally, the shipbuilding process operates on a made-to-order basis [6]. After signing the shipbuilding contract, the process includes meeting all the requirements outlined in the agreement, designing the ship, getting the necessary materials and tools, building and assembling the ship, testing it in both dry dock and the water, and finally delivering it to the designated location. Each phase of shipbuilding, from design to trial, must adhere to the mandated class standards due to ship safety requirements. To guarantee compliance with class standards, every phase of the shipbuilding process is consistently examined and sanctioned by the class surveyor.

The make-to-order method, along with the different requirements spelled out in the contract and the rules for ship safety set by Class and the International Maritime Organization, comes with a lot of risks that could cause shipbuilding projects to be delayed or fail from the beginning to the end. The primary hazards that may arise in medium-sized shipyards include labour supply, material supply, human resources, exchange rates, design modifications, and capital funding. Specific risks in the shipbuilding process include problems with ship specifications. Shipyards may not be able to understand the technical requirements because they don't have enough staff, haven't worked on similar projects before, or aren't familiar with

cutting-edge technology. The subsequent clause in the agreement. The danger to the contractual payment terms might affect both shipyards and shipowners. The subsequent item is the penalty. A delay in the ship's timetable will result in a fine for the shipyard, disrupting the company's cash flow and hindering the shipyard's ability to complete the job if the ship is already late.

2.4. Field verifications (Fact finding)

Fact-finding procedures [7, 8] encompass methods such as interviews and surveys to collect information regarding the system, requirements, and preferences. Field verification was conducted using a combination of qualitative methods. The initial technique is documentation examination. This technique is applicable for obtaining input regarding the anticipated database requirements. The second is Interviewing Methodology. This is a widely employed strategy that is particularly effective for conducting fact-finding methods.

This strategy involves conducting structured interviews to collect detailed qualitative information from stakeholders. The third technique is observing the enterprise in operation. This strategy is among the most successful and comprehensible methods inside the fact-finding techniques framework. This technique enables direct participation in activities aimed at comprehending the system. The fourth technique involves conducting research on fact-finding strategies. This technique is the most beneficial aspect of application research and its associated challenges. To obtain a reliable source of knowledge, one can consult periodicals, reference books, and the internet. The final method is the questionnaire technique. This technique administers a survey via a questionnaire. The purpose of a questionnaire is to collect data from various sources.

3. Results and Discussion

This evaluation focused on eight vessels procured between 2015 and 2019 that remained undelivered by mid-2020. The construction was assigned to four shipyards: PT. Steadfast Marine (Pontianak), PT. Dok & Perkapalan Kodja Bahari (Jakarta), PT. Prakitri Hasta Darma, and PT. Krakatau Shipyard. A critical assessment of each shipyard was conducted to identify institutional, technical, and financial factors contributing to the delays.

A concise overview of the four shipyards is provided here. PT. Steadfast Marine, located in Pontianak, is a national private shipyard founded in 2008. Prior to 2015, this shipyard primarily engaged in the production of tugboats, hopper barges, and aluminium vessels. The available experience data indicates that it has never constructed pioneer ships. Between 2015 and 2019, PT. Steadfast Marine was documented to have undertaken the construction of 38 new vessels. This is a substantial figure for an inexperienced shipyard. Furthermore, the company's location is outside of Java.

The second is PT. Dok and Perkapalan Kodja Bahari Persero, Jakarta. Hereafter, it is designated as PT DKB. PT. DKB is a state-owned shipyard, which has historically demonstrated a pattern of failing to complete ship construction projects on schedule. In 2015, PT. DKB remained encumbered by the obligation to finalize the construction of a new vessel, specifically a tank transport ship commissioned by the Ministry of Défense of the Republic of Indonesia in 2011. The completion

timeline was initially set for 18 calendar months; however, by 2015, and extending into 2019, the vessel had yet to be delivered.

Furthermore, PT. DKB's financial statements from the 2013 Financial Report indicate that the company has incurred successive losses, resulting in a negative equity position and short-term liabilities exceeding current assets, hence raising concerns about its future operational viability. The financial aspect of its implementation is addressed through an Operational Cooperation agreement with PT. Krakatau Shipyard. The third entity is PT. Prakitri Hasta Darma, henceforth referred to as PT. PHD. This company was founded on June 24, 2009, making it six years old at the time of the ship construction auction.

To complete the auction assessment, PT. PHD engaged in an operational cooperation with PT. Daya Radar Utama, while the construction utilized PT. Lintech's facilities in Lamongan. At that time, PT. PHD independently secured the building contract for 10 units of *rede* ships and one unit of a 1200 GT pioneer ship. PT. PHD lacked prior experience in constructing pioneering vessels.

3.1. Delays in ship construction

In total, eight ships have been constructed since 2015, and as of the first semester of 2020, they have not been delivered from the shipyard to the Ministry of Transportation. Five significant points can be elucidated concerning the delay in ship construction.

All vessels are experiencing delays. According to the data available at the time of this report's production, out of 90 ships constructed, none were completed punctually. The delay durations are as follows: 43 vessels (48%) experienced delays of 4-6 months; 17 vessels (19%) were delayed by 1-3 months; 14 vessels (16%) faced delays of 7-9 months; and 8 vessels (8%) encountered delays exceeding 20 months.

Until the first semester of 2020, 8 units (8%) of undelivered ships were associated with only 4 shipyards, each with their specific internal circumstances. The four shipyards are: a) PT. Dok & Perkapalan Kodja Bahari, b) PT. Steadfast Marine, c) PT. Prakitri Hasta Darma d) PT. Krakatau Shipyard.

The third point addresses the primary issues within the shipyard that contributed to the delay in ship construction. The considerations include cash flow, labour, shipyard facilities, and recently instituted BKI (Indonesian Classification Bureau) material certification.

The fourth aspect is the assessment of financial qualification standards; no study has been conducted on financial reports about the capacity for ship construction.

The examination of tender papers for auctions involving several work packages must consider the following factors. Firstly, monitor procurement or auction participants engaged in multiple job packages. The second objective is to verify the tender documents pertaining to specialists, facilities provided, and other elements associated with each work package. Moreover, competitors that successfully navigate the technical selection and emerge as potential winners are verified against the tender papers for subsequent packages. This seeks to guarantee the shipyard's capacity to meet the requirements for expertise, infrastructure, and adequate working capital should the participant be designated as the winner.

3.2. Main factors causing delays in the shipbuilding process

Delays in shipbuilding are largely influenced by four primary factors: financial management, labour availability, shipyard facilities, and the certification of ship components by the Indonesian Classification Bureau (BKI). These factors must be systematically evaluated both during the tender process and throughout the construction phase to ensure timely project execution.

Shipyard management can be assessed through the financial management of the shipyard. The financial status of a shipyard is assessed through its financial ratios, in conjunction with the company's capital and available bank loans. The company's capital must be a minimum of 10% of the total construction expenses. Financial ratios encompass profitability ratios, liquidity ratios, solvency ratios, and activity ratios. Furthermore, the planning of shipbuilding clearly demonstrates this. This is evident from the shipyard development strategy, which encompasses the arrangement of facilities and the logistics of commodities managed by the shipyard.

Project management planning encompasses job descriptions, workflows, and a roster of workers. The team consists of five engineering specialists with bachelor's degrees in marine engineering/marine systems, five mechanical/electronics engineers, production staff, qualified welding and blasting professionals, and project leaders with 15 years of project management expertise.

Consequently, the workload or project undertaken by a shipyard becomes evident. This pertains to the location associated with the development process and its length.

Financial management pertains to a company's capital during tender participation. From a financial perspective, the shipyard owns sufficient money to prevent delays caused by late payments from the ship owner upon the payment's due date.

Material is the primary component in ship construction. The material procurement process is crucial and may result in extended building timelines if attention is not given to the conditions and delivery to the shipyard. This may occur at the shipyard, resulting in material reordering and construction delays.

Labor is the second factor to consider. As a result of the implementation of ship construction in 2015, which was carried out almost simultaneously with many personnel, in comparison to previous years, the need for labour reached 6,300 personnel. This resulted in several shipyards, particularly those located in regions outside of Java-Batam, potentially experiencing difficulties in supplying labour. Moreover, this will have an immediate influence on the level of productivity that can be achieved at the shipyard. It is essential for the shipyard to have enough workers since the number of workers have a significant impact on the productivity of the shipyard. Additionally, certified workers have a significant impact on the skills that will be utilized. Both a drop in productivity and a delay in the amount of time needed to complete construction projects can be caused by a shortage of workers and certified individuals. If the shipyard needs workers, it can hire outsiders or subcontractors.

Having shipbuilding facilities is the third consideration. Facilities at the shipyard, in addition to the workforce, have a significant impact on the overall productivity of the shipyard. The work process is affected when there is a lack of equipment, facilities

or inadequate infrastructure, which can cause delays in the amount of time it takes to complete the construction project. Shipyards that get more than one work package and, when the tender documents were being looked over, the work facilities offered were not cross-checked (it's possible that the same facilities were offered for multiple work packages), will have trouble meeting production goals during construction because they will not have enough tools. This is due to the potential for multiple shipyards to offer the same facilities for different projects.

The fourth factor is the Ship Component Certification issued by the Indonesian Classification Bureau (BKI). The Indonesian Classification Bureau's (BKI) new ship component certification slowed down the progress of some work stages and meant that some materials had to be recertified by BKI, even though they had already been certified by other classification bureaus.

4. Conclusions

Conclusions were derived from the data and information gathered through interviews and questionnaires regarding the implementation of ship construction from 2015 to 2019. The delay in the construction of the Ministry of Transportation's vessels, developed under the multi-year contract (2015-2017), proceeded rather smoothly overall. By the first semester of 2020, 82 ships had been delivered, representing 91% of the 90 units ordered. By November 2021, the number of delivered ships climbed to 86 units, accounting for 97% of the 90 ordered ships. All ordered ships experienced construction delays of varied lengths. Seventeen units (19%) saw a delay of one to three months. Forty-three units, representing 48%, saw a delay of four to six months. Fourteen ships, about 16%, encountered delays ranging from 7 to 9 months. Eight vessels (8%) encountered a delay of 10 to 15 months. Eight vessels (8%) encountered a delay of 20 months.

The conducted study offers recommendations to enhance the selection process and implementation of ship construction, aiming to reduce the likelihood of long-term delays in ship construction work. The submitted suggestions aim to enhance the shipyard selection criteria for new ship construction and oversight during the construction process.

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