East African Scholars Journal of Economics, Business and Management
Abbreviated Key Title: East African Scholars J Econ Bus Manag
ISSN 2617-4464 (Print) | ISSN 2617-7269 (Online)
Published By East African Scholars Publisher, Kenya

Volume-4 | Issue-7 | August-2021 | DOI: 10.36349/easjebm.2021.v04i07.003

OPEN ACCESS

Original Research Article

Analysis of Project Management Implementation for Ship Docking Repair

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Article History
Received: 05.07.2021
Accepted: 10.08.2021
Published: 20.08.2021

Journal homepage:
https://www.easpublisher.com

Quick Response Code

Abstract: This study discusses research to study and analyze differences in time efficiency and cost realization and the application of project management in MT Sepinggan ship docking repair. The research uses quantitative and qualitative methods (mixed methods). Analysis of quantitative data uses descriptive statistics and non-parametric statistical different tests, while qualitative analysis uses descriptive-qualitative. The results showed: differences in the time and realization cost of repairing MT Sepinggan ship docking repair. Furthermore, project management has been done well with docking repair vendors in the place and material.

Keywords: Docking repair; Project management, Efficiency; Time; Cost.

INTRODUCTION

Industry in Indonesia is currently experiencing rapid development along with the need for skilled workers in operating industrial equipment, having expertise following its specifications, and having a high ability of adaptation to the use of technology, specifically to support processes and maintenance in industrial activities, including the oil and gas industry. PT Pertamina (Persero) is part of the oil and gas industry which has a shipping fleet as the artery of oil and gas distribution in Indonesia. By using a vessel owned by PT Pertamina, crude oil is distributed from upstream to processing and from processing to marketing in the form of refined fuel oil. In addition to distributing domestic fuels, ships owned by PT Pertamina also carry and receive imported cargoes in the form of crude oil, fuel products, and gas from outside Indonesia to meet domestic and basic fuel needs. The need for cargo transportation by Pertamina-owned vessels is crucial because of Indonesia's geographical conditions in the form of islands and the distribution of PT Pertamina's production and storage facilities spread across various islands. The sea transportation mode is the most efficient and effective means of transportation to reach the islands of Indonesia so that PT Pertamina's fleet is at the forefront of the distribution of fuel, raw oil, and gas in Indonesia. To maintain the reliability of PT Pertamina's ship operations, it needs the supporting functions of the seaworthiness of the ship, which manages technical ship management. In Pertamina Shipping, there is a technical fleet function that manages 66 ships' ship management. The technical fleet function is divided into technical fleets I, II, III, and commercial fleets.

The tasks of the technical fleet function are system maintenance, dry docking, spare part inventory, and ship certificate management. Pertamina's ship maintenance includes routine maintenance by the ship's crew (preventive maintenance). Care is taken when damage occurs when the ship is operating (breakdown maintenance) assisted by the shore base (owners superintendent). As for dry docking, the task of the technical fleet function is to plan and guarantee the implementation of dry docking at the right cost, quality, and time (minimum out operation). In addition, another technical fleet task is to maintain the availability of spare parts on the ship by making an owner estimate and purchase requisition for the procurement of spare parts on the ship. The task of the last technical fleet function is ship certificate management which is the management of ship documents as one of the requirements for sailing, especially documents related to regulators and classes.

The ship's performance is a benchmark for the performance of the technical fleet function. Performance evaluation variables are speed, pumping rate, and commission days. Therefore maintenance and dry docking become very important to maintain the technical performance of ships, especially during dry-docking, because this work requires a very high cost

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and reduces the commission days (the number of days that the ship operates) of the ship. This requires supervision during dry-docking so that there is no excess cost and time as well as quality accuracy based on technical specifications/docking specifications.

Pertamina Shipping is one of the functions of PT Pertamina (Persero) which has the duty to meet the transportation needs of Pertamina's cargo of fuel, crude oil, and LPG starting from upstream to downstream (TBBM/Depot) by sea. In Pertamina's vessel operations, costs incurred are borne by PT Pertamina, namely: crew salary costs, bunker costs (fuel for ships), entrance fees and port charges, and maintenance costs: running repairs when repairing ships float or sail) and docking repair (when the ship stops operating and enters the shipyard). In this case, the technical fleet has the responsibility to handle ship maintenance. Docking repair is carried out based on the rules of the ship's state flag as well as the compliance regulations of the classification body to maintain the reliability of the ship and the operational safety of the ship. The rules of docking repair in Indonesia are outlined in General Director of Sea Transportation No HK.103/I /4/ DJPL-14 concerning the Docking of Indonesian-flagged vessels. Based on the rules of the General Director of Sea Transportation, for ships other than passenger ships (general), docking (reimbursement) in the examination renewal survey / special survey renewal every five years and for intermediate surveys between the second year or the third year.

Docking repair is also carried out to make repairs that cannot be done while the ship is operating. For example, painting the hull, replating the hull, and others. During the ship docking, the ship must be out of operation, and Pertamina must find a replacement vessel for Pertamina's fuel and gas distribution activities. The longer Pertamina's ship is out of operation, the potential for Pertamina losses from renting ships from other parties will be even greater. Therefore, the docking repair must be as short as possible. Based on the fleet support function data, the value of docking performance from 2016 - 2018 for TF-I has an average performance docking days = 78% and an average performance docking cost = 95%.

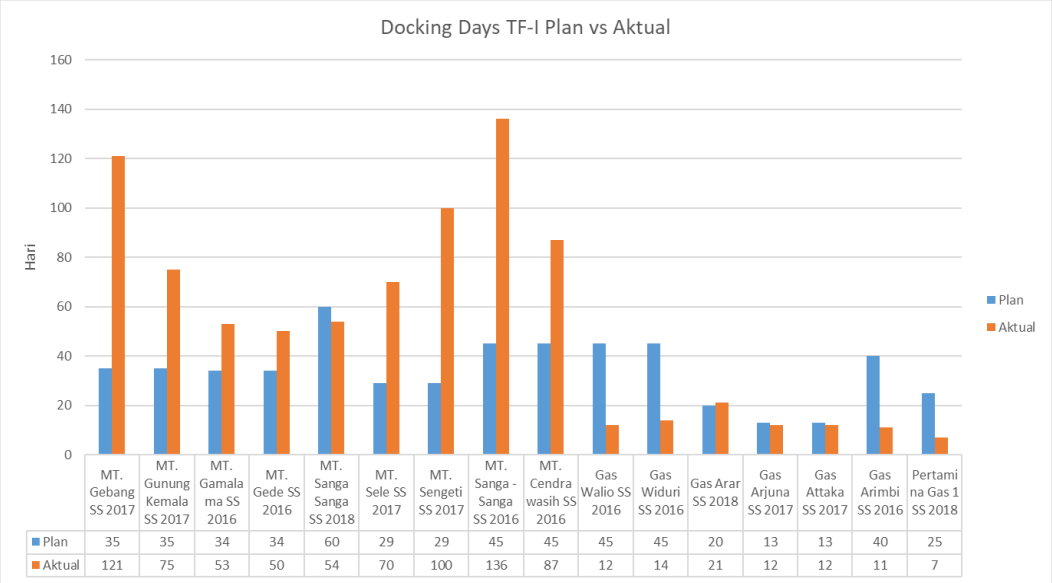

Figure-1: Plan and Actual Docking Days

From the graph above, it can be seen that the comparison between planned docking days and actual docking days has a large deviation. As for the performance of the carrier gas vessels, the average implementation was faster than planned. This is because the owner superintendent of the gas vessels performs optimum planning and good control in the implementation of docking repair of gas carrier vessels. Other ship delays that occur during docking repair are caused by many things with their respective justifications. However, this study will not be discussed in detail the causes of the delay in each ship's docking repair. Pertamina's docking repair is basically a project because it has characteristics including (1) done within a certain time limit; (2) has unique requirements; (3) limited by limited resources; and (4) done by many people, so that it requires good management so that docking repair work can run according to the target time, cost, and quality.

In this research, the object of the research is a ship owned by PT Pertamina (Persero) MT Sepinggan P 3008 which is one of the "meritorious" tankers in the Pertamina fleet. This ship last conducted a docking survey on the maturity of the intermediate docking survey in March 2019. This ship has a DWT large enough to 29,941 tons. This ship is one of the veins of MFO fuel distribution in Indonesia. Because of the age of the ship that has passed the 4th special survey (SS) (37 years), the ship is required to conduct a condition

assessment scheme (CAS) on each docking survey. The CAS is a series of assessments of the ship's overall structural condition by a classification body or agency appointed by the Directorate General of Sea Transportation. The previous CAS Sepinggan P 3008 CAS Plan must be approved by the Directorate General of Sea Transportation and carried out by the classification body, BKI. The survey form in CAS is a close-up survey, a visual survey of the ship's structural conditions until the object's surveyor is reached.

With good project planning in terms of the project leader, implementation is assisted by the project control manager, site manager (technical control), hull, painting, and outfitting inspector and the crew as a whole. The MT Sepinggan P. 3008 docking repair project can run without a work accident (there are a number of incidents that are suspected as negligence in the safety aspect) and with costs that are still within the budget range.

Execution of maintenance in the MT Sepinggan ship there are several models, including (1) Plan Maintenance System, for critical items as follows: main engine, auxiliary engine, compressor, boiler, cargo oil pump, and navigation and LSA FFA; (2) Corrective Maintenance System: electrical relay, etc., and lighting; and (3) Condition Based Maintenance: structural and piping system.

In the implementation of the MT Sepinggan P 3008 docking repair project, there are a number of milestones that must be passed and completed in accordance with the project team's plan. There is a slight change in the actual off-hire of the ship because there is a deviation from the shipping operation to Tanjung Manggis and Surabaya; the new ship is off-hired. The length of time of docking also slightly shifted from 12 days to 15 days due to several constraints that resulted in off-hire days to 24 days.

This condition can occur because in general, the work of MT Sepinggan P 3008 ship docking survey is full of challenges and obstacles for the TF 1 project team. Some of the problems experienced during the supervision of the MT Sepinggan P 3008 docking repair work at PT Daya Radar Utama (DRU)) among others:

1. Docking repair of MT Sepinggan P.3008 vessel 37 years old is a challenge for the project management team to continue the positive culture in saving docking days and off-hire time by preparing work plans as optimal as possible.
2. The duration of the MT Sepinggan P. 3008 docking repair work was originally planned to last 14 days, but based on the RL and professional adjustment from the TF 1 team, this project should have been completed within 12 days because PT DRU's performance was unable to meet the demands of the standard docking work. Should make docking days 14 days and two days delay.
3. The weak managerial side of PT DRU to play the work strategy in the field has hampered several projects, such as the preparation of purchasing materials, plotting manpower (managerial) for tank cleaning and design in the tank, inadequate safety, and support from management which is not good.
4. The work credit strategy before the ship arrives at the shipyard includes close-up surveys and UT measurements, tank cleaning, pipe fabrication, pumping, and almost services, having an important role in increasing ship shipping on the pier related to the performance of PT DRU on the dock.
5. The tightness of the work in MT Sepinggan P. 3008 requires the team to always monitor well the progress of the work and determine a good strategy to manage the works. The comparison of MT Sepinggan 3008 ship docking in 2019 with previous docking (2012 and 2016) is as follows:

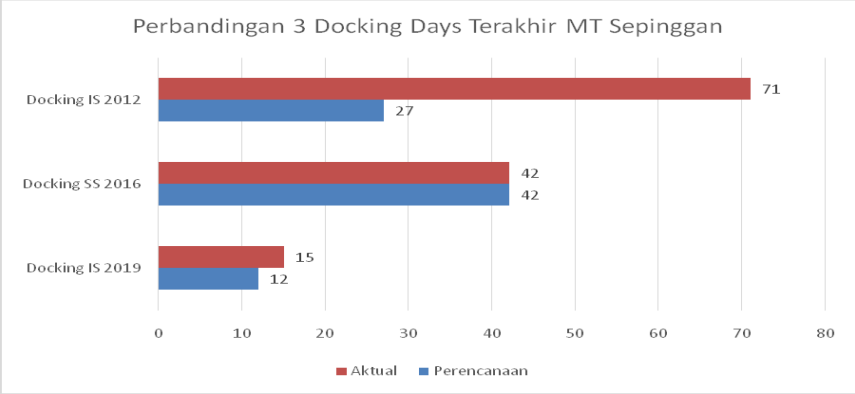

Figure-2: Comparison of MT Sepinggan Docking Days

Although the MT Sepinggan P 3008 ship in 2019 based on project management was not timely (delayed for three days, from 12 days to 15 days), this achievement far exceeded the previous dockings. For example, in 2016, although it was on time, it took 42 days. In 2012, it was even worse; the planning was 21 days while the implementation was 71 days.

LITERATURE REVIEW

Project Management

According to Hughes and Cotterell (2012), project management is a way to solve problems that must be presented by users, user needs must be visible, and good communication must occur so that user needs can be known. Meanwhile, according to Schwalbe (2016), project management is the application of knowledge, expertise, equipment, and techniques for project activities in accordance with project needs. Project management has been very helpful in accomplishing projects on time, within budget, and meeting quality standards. Project management is also can be viewed as an innovation of organization structure. Project management has both narrow and broad senses. Project management, in traditional core approaches, such as scheduling, cost control, and quality management that helps to deliver project targets (Li, Lu, & Huang, 2009). According to Morris (1994), project management is about the total process, not just about realizing a specification to time, cost, and quality. However, project promoters are conducting project management (i.e., project scheduling and control) mainly based on experience and engineering intuition (Petroutsatou, 2019). Project management provides methodologies, tools, and control to guarantee the quality of investment (Pellicer & Victory, 2006). In project management, good leaders are required to assign appropriate importance to relationships, communicate their values, and at the same time pay suitable importance to processes (Turner, 2006). Given the significance of project management processes and team members in project success, the project manager has to pay attention to both the management and leadership roles; the emphasis shifts from one role or the other based on the size and characteristics of the project (Anantatmula, 2010). For Kerzner (2013), project management is planning, organizing, leading, and controlling company resources to achieve short-term goals that have been determined. Meanwhile, according to PMI (2018), project management is the application of science, skills, tools, and techniques to the activities of a project with the intention of meeting or exceeding the needs and expectations of a project. Furthermore, project management uses a systems approach and vertical and horizontal hierarchies. Project management is also the process by which the team aims to produce products that match or exceed the demands of the assignor within a certain period of time and usually fall within certain resource constraints (Morris & Huogh, 2012).

Efficiency and Realization

Parida and Kumar (2016) state that the level of efficiency and effectiveness of a maintenance system has an important role in the success and sustainability of a company, so the performance of the system needs to be measured using a performance measurement technique. Some reasons that support the importance of MPM, according to Parida and Kumar (2013), are to measure the value incurred by maintenance, to analyze the investments made, to review the resources allocated, to create a healthy and safe work environment, to focus on knowledge management, to adapt to new trends in operation and maintenance strategies, and for organizational change structurally.

Efficiency produces a given output at the lowest possible cost (Agasisti & Belfield, 2016). Efficiency is related to how well an organization is achieving maximum output with minimum consumption of inputs (De Witte1 & López-Torres, 2015). Efficiency is the ratio between the observed and optimal values (or best practices) of its outputs and inputs (Guccio, Martorana, & Mazza, 2017). Efficiency is a comparative measure of how well it processes inputs to achieve its outputs, compared with its maximum potential for doing so, as represented by its production possibility frontier (De Jorge & Suárez, 2014). Efficiency also describes the ability to transform inputs into outputs and eventually find a correlation between efficiency and education institutions' characteristics or environment (De Witte1 & López-Torres, 2015). Efficiency requires a clarification of the valuation function which the institution places upon the volume and assessed quality of its outputs (Mayston, 2015). To increase efficiency can be done by reducing the input (Zeeba & Newman, 2007) and the use of more accurate data-driven digital technology product supply (Peukert, 2019). Brons et al. (2005) focus on urban transport, finding no statistical difference in efficiency between parametric and nonparametric studies. Hence, clear and specific cost-efficiency criteria for adopting new requirements have been defined or are under development. One of the benefits of using this approach for regulatory development is that the resulting regulations governing maritime safety and environmental protection will be based on a sound rationale and that pertinent costs imposed by new requirements may be defended based on achievable risk reductions (Longva, Eide, & Skjong, 2010).

Efficiency and realization are related to the target because, according to Hasan (2012), the target determines the target market, namely the act of selecting one or more segments to be served. At the same time, realization is a real action or a movement /change from a plan that has been made or done (Hasan, 2012). Organizational effectiveness is the level of success in achieving organizational goals (targets), with the formula E = R / T. E = Efficiency, R = Realization, and T = Target. R is a process - in this case, the production process - and each process consists of input, throughput, and output (Makmur, 2013).

Ship Docking

Before docking and repairing the ship, the Master, KKM, and Mualim I must ensure that all preparations have been completed. The preparations include (1) Ballasting and trimming to desired

conditions; (2) Drain and gas-freeing the oil tank that will be carried out repairs; (3) Securing valuables; (4) Secure hand-tools in the engine room and on the deck; (5) Confirmation that the parts ordered by the company are in place and can be immediately available after the ship is in the shipyard. Before confirmation, there are several tasks to be carried out, namely the purchase of goods carried out by the owner. Buy all the needs and parts for repairs; all the needs and parts are confirmed by the dock company. By dock repair company, buy all the needs and parts for repairs, all the needs and parts are in accordance with the composition of the properties and chemicals of the material required by the owner; (6) Other preparations are important to speed up repairs and avoid delays and additional days at the shipyard; (7) Ship handover documents from the owner to the shipyard; (8) Supervision, functional tests, and testing-owner surveyor; (9) Controlling; and (10) final test.

Ship Costs

In the transportation context, especially shipping, the maintenance cost will vary with the type of engine (diesel or turbine, 2 or 4 stroke diesel, size, etc.), age, and running hours per year (Tzannatos, 2014). In practice, cost efficiency is significantly higher than profit and production efficiency (Aiello & Bonanno, 2015). According to Muslihati (2012), the ship's cost is assumed as an expense of the ship's price and the operational costs of the ship when sailing and anchored. Voyage costs are variable costs incurred by ships for needs during shipping. The shipping cost components are fuel for main and auxiliary engines, port costs, scouting, and delaying.

Voyage calculation is the calculation of the cost of ship travel from one port to the destination port. The point is the costs required for the ship to move. How much it costs to travel from A to B depends on many factors. Ranging from internal factors to external travel factors. It can present with the formula below: BP=BB+BP (BP: Travel costs, BB: Fuel costs, BPL: Port fee).

Ships Cost

Ships costs include many things such as landing services, moorings, guides, and delays. There are also port entrance fees, loading and unloading fees, and containerization fees. Many of the costs in voyage calculations are the port costs. Fuel costs remain relatively dependent on world oil prices. Voyage calculation consists of shipping cost components (capital costs, operating costs, voyage costs, cargo handling costs). Capital cost is the initial capital for ship procurement. The structure of vessel operating costs consists of direct costs, including investment costs for purchasing vessels and operating costs and indirect costs / overhead costs.

The direct cost component consists of fixed and variable costs. RMS (Repairs, Maintenance, and Store) costs are included in the direct costs of fixed costs. Running repairs costs the costs incurred for repairs while the ship is operating. Maintenance costs are maintenance costs carried out when the ship is docking and carried out annually.

METHODS

The study uses mixed methods, namely quantitative and qualitative methods. Quantitative analysis includes descriptive and comparative statistical formulas, while qualitative analysis is carried out with descriptive-qualitative analysis to describe the management of the MT Sepinggan ship docking repair project owned by PT Pertamina (Persero) Perkapalan, Jakarta.

RESULTS AND DISCUSSION

The Difference in Time Efficiency and Realization of Docking Repair Costs

Docking repair is done to maintain the reliability of the ship and the operational safety of the ship so that the ship's performance can be maintained well. In 2019 the company will implement project management in docking repair work. The following is the time required for the docking repair of MT Sepinggan ships with four annual data.

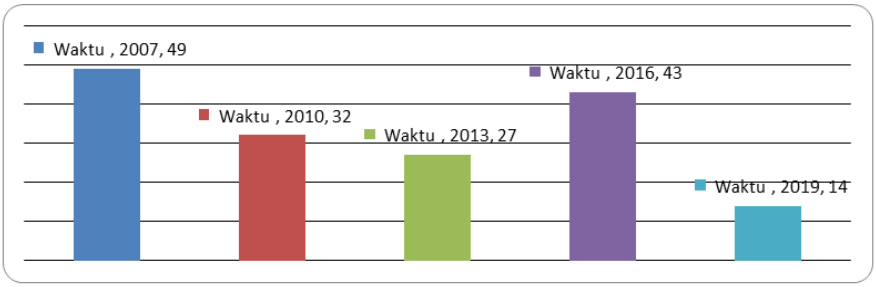

Figure-3: Docking Repair Time of MT Sepinggan Ship

Based on the graph above shows that the MT Sepinggan Vessel docking repair time is volatile. 2007, 2010, 2013, and 2016 are the years before implementing project management, while in 2019, the time for project management is implemented. In 2007, the docking repair time was 49 days, in 2010 = 32 days, in 2013 = 27 days, in 2016 = 43 days, and in 2019 = 14 days. On average, the docking repair time before

implementing project management is 38 days. When compared with 2019 after implementing project management, there is a difference of 24 days. Thus, there is a difference in the time difference required in docking repair before and after the implementation of project management.

Related to the cost of MT Sepinggan docking repair, the total cost of docking repair in 2007 = Rp. 44,208,400,866, in 2010 = Rp. 17,019,832,200, in 2013 = Rp. 22,137,912,448, and in 2016 = Rp. 41,736,065,980. The average cost of docking repair before the implementation of project management is Rp.33,755,552,874. When compared to the average cost before and after the implementation of project management is Rp. 31,275,552,874 - Rp. 7,522,991,104 = Rp. 23,752,561,770.

While the results of the Wilxocin difference test calculation to test the hypothesis of the differences in the realization of the MT Sepinggan docking repair costs before and after the implementation of project management are presented as follows:

Table-1: Results of Test Differences in Realiation of Docking Repair Costs

Sample Size (n)	Z_{value}	Significance
22	-4.107	0.000

Z value before and after the implementation of project management is -4.107. Therefore, the Z value is negative, showing that after implementing project management, the cost of docking repair has decreased. While the significance value of 0.000<0.05 (5%) means are differences in the realization of the cost of docking repair MT Sepinggan before and after the implementation of project management.

Project Management-Based Docking Repair Planning on MT Sepinggan Ship

Planning is important in project management. With good planning, the work can be carried out in accordance with predetermined goals. Docking repair planning is done well in advance of its implementation. Planning activities include setting targets, defining projects, and organization of MT Sepinggan Ship Docking Repair team. In the PMS section, planning is carried out H-90 before the project starts, preparation is carried out in collaboration with all stakeholders, coordinating with regulators and vendors. In the Project Engineer section, planning is carried out in preparation with the finalization of SPEK on H-60, and estimates can be completed at that date range. Meanwhile, the Budget Control section explained that the planning was carried out with the entire team divided into their work assignments and began preparations according to their respective duties and responsibilities well before H. The difference between planning and before applying project management is that planning is not done thoroughly. Another difference, prior planning, is that those who prepare for docking are invisible and seemingly closed with other functions.

Implementation of Project Management Based Docking Repair on MT Sepinggan Ship

Docking repair activities are carried out by linking labor, money, and materials used in the project. Implementation is carried out with a predetermined plan. In addition, the field implementation is monitored, and detailed developments are reported. While the difference in the implementation of the previous docking repair is the existence of control in terms of budget and time of implementation reported to related parties and reported transparently. In addition, the work is carried out in a teamwork and parallel manner so that the work is completed in a shorter time and costs less. The advantages of implementing project management-based docking repair are better to work supervision and better team performance. Thus, the existing problems can be anticipated well. The parties involved in the implementation of docking repair are all function workers involved in work such as BKI, Syahbandar, Shipyard, SO as cargo owners, and various lines in internal functions such as Estimator, Project owner, and procurement. Implementation in the field was represented by three people site manager, project engineer, and project control, while in the office, there was control ranging from the budget controller and project owner. Every worker has competencies according to their respective fields that have been adjusted to their portion and responsibilities. Thus, in the implementation of docking repair, there are still obstacles. Functions involve outsiders or other functions that are sometimes not in line with the timeline. From external parties, shipyards are not ready in terms of place or material, even though the time and SPEK dock have been submitted far in advance. This obstacle can be overcome by coordinating with other parties concerned. Another thing that can be done is to survey the vendor before submitting docking work so that the selected vendor is a vendor who really has good qualifications and has a track record that can be trusted.

Supervision of Project Management Based Docking Repair on MT Sepinggan Ship

Supervision is carried out so that the work can be carried out in accordance with a predetermined plan. Supervision is carried out in parallel on the docking work, which is also done in parallel, and reports on the work are done daily. Supervision is also carried out separately from the executor and structured, and all functions coordinate and work in accordance with their respective responsibilities so that supervision can be carried out properly and organized. In the previous supervision that did not use project management only carried out 1-2 people and the absence of daily reports.

With the daily report, the relevant parties can find out the progress of the work so that if there are obstacles, they can be overcome quickly. Supervision is

carried out by a supervisory team consisting of three people: project engineer, project control, and site manager. With the supervision of a team, the supervisory function becomes more detailed and comprehensive, and the work can be carried out in accordance with the specified time. In addition, the supervision carried out is not excessive and transparent and is more optimal.

DISCUSSION

The results showed that there were differences in the efficiency of the MT Sepinggan ship docking repair time. This is indicated by the 24-day gap between before and after the implementation of project management in docking repair. It can be understood that in the application of project management, time is a concern in the implementation of a project. With the time required to carry out the project and the schedule of activities that have been determined in advance, then the expected time of project implementation is not too far from the determined time. Docking time greatly affects the operation of the ship, so that it can affect the company's performance. Therefore, the docking time can be carried out as short as possible so that the company does not lose potential revenue from ship operations. This evidence is consistent with the study by Akintayo *et al*., (2020) that time management is related to business performance.

In addition, the results of the study indicate that there are differences in the costs of MT Sepinggan ship docking repair. This is indicated by the Wilcoxon difference test significance value of 0.000 <0.05. It can be understood that in the application of project management, costs are things that are considered in the implementation of a project. Costs required in a project have been determined beforehand so that implementation must be controlled so that the costs are not swollen. In addition, project management has also determined the scope, time, funds, and resources in project implementation so that work is directed according to prior planning. Project management, implementation, and supervision can be carried out properly so that docking repair works according to plan. This result aligns with the previous study by Li, Lu, and Huang (2009) that scheduling, cost control, and quality management in a project management context is to deliver project targets. Research results conducted by Daniel (2019) and Aslami (2019) also claimed that project management influences organizational performance.

Planning docking repair on MT Sepinggan ships is done with good planning. Long before docking repair has been done, the preparation. All related functions are involved in planning both internal and external parties of the company. Planning is done thoroughly both in terms of timeline, budget, and the implementer. In addition, all lines can contribute well so that planning can be more mature and transparent. Planning activities include setting goals, defining projects, and organization of MT Sepinggan Ship Docking Repair team. With good planning, docking repair activities can be carried out in accordance with expectations with adequate supervision.

The docking repair is carried out with a predetermined plan and is controlled in terms of the budget and the implementation time reported to the relevant parties and reported transparently. In addition, the work is done in teamwork and parallel so that the work is completed in a shorter time and with minimal costs. Internal parties and external parties are involved in repair docking work to smooth the stages of work. Implementation in the field was represented by three people: site manager, project engineer, and project control, while in the office, there was control ranging from the budget controller and project owner. However, in the implementation of docking repair, there are still obstacles. From the external party, the shipyard is not ready in terms of place or material. Therefore, there is a need for vendors before submitting docking work so that the selected vendor is a vendor who has the qualifications and has a track record that can be trusted. In addition, an evaluation of the vendor is done so that the deficiencies that occur can be communicated so that docking repair in the future does not experience significant obstacles.

Supervision is carried out in parallel on docking work such as painting, steelwork, and machine tools, as well as work reports, which are carried out daily. With the daily report, the relevant parties can find out the progress of the work so that if there are obstacles, they can be overcome quickly. In the previous supervision that did not use project management only carried out 1-2 people and the absence of daily reports. Supervision after the implementation of project management is carried out by a supervisory team consisting of three people: project engineer, project control, and site manager. With the supervision of a team, the supervisory function becomes more detailed and comprehensive, and the work can be carried out in accordance with the specified time. In addition, team supervision is not excessive and transparent and is more optimal. No significant obstacles were found in MT Sepinggan's ship docking repair supervision function.

CONCLUSION

There is a difference in time efficiency and the realization of MT Sepinggan ship docking repair costs before and after implementing project management. The project management-based docking repair plan on MT Sepinggan ship has done well by involving all the functions related to both internal and external parties of the company, and planning is carried out thoroughly in terms of time, cost, scope, and implementation. Therefore, project management-based docking repair on MT Sepinggan docking repair is done in teamwork and

parallel with internal and external parties. However, there are still obstacles in implementing docking repair, where the shipyard is not ready in terms of place or material. Therefore, project management-based docking repair supervision on MT Sepinggan docking repair is suitable. Supervision is carried out by the supervision and reporting team daily.

REFERENCES

- Agasisti, T., & Belfield, C. (2016). Efficiency in the community college sector: Stochastic frontier analysis. Tertiary Education and Management, 23(3), 237–259. DOI:10.1080/13583883.2016.1238956
- Aiello, F., & Bonanno, G. (2015). Efficiency in banking: a meta-regression analysis**.** International Review of Applied Economics, 30*(1), 112–149.* DOI:10.1080/02692171.2015.1070131
- Akintayo, D. I., Adetunji, S. O., Ayantunji, I. O., & Olaniyan, T. S. (2020). Time management and business performances in banking industry in Nigeria. Journal of Human Resources Management and Labor Studies, 8(2), 1-11 DOI: 10.15640/jhrmls.v8n2a1
- Anantatmula, V. S. (2010). Project manager leadership role in improving project performance. Engineering Management Journal, 22(1), 13–22. DOI:10.1080/10429247.2010.11431849
- Aslami, M. J. (2019). The effect of project management on organizational performance – The case of NGOs in Afghanistan, 1-14. DOI:10.2139/ssrn.3395721
- Brons, M., Nijkamp, P., Pels, E., & Rietveld, P. (2005). Efficiency of urban public transit: a meta analysis. Transportation, *32*, 1–21.
- Daniel, C. O. (2019). Effect of project management on the performance of selected construction firms in Nigeria. Journal of Research in Business and Management, 7(2), 08-13.
- De Jorge, J., & Suárez, C. (2013). Productivity, efficiency and its determinant factors in hotels. The Service Industries Journal, 34(4), 354–372. DOI:10.1080/02642069.2013.778977
- Eugenio, P., & Richard, V. (2006). Implementation of project management principles in Spanish residential developments. International Journal of Strategic Property Management, 10:4, 233-248, DOI: 10.1080/1648715X.2006.9637555
- Guccio, C., Martorana, M. F., & Mazza, I. (2017). The efficiency change of Italian public universities in the new millennium: a non-parametric analysis. Tertiary Education and Management, 23(3), 222–236. DOI:10.1080/13583883.2017.1329451
- Hasan, A. (2012). Marketing. Jakarta: PT Buku Kita.
- Hughes, B., & Mike, C. (2012). Software project management. London: McGraw-Hill.
- Kerzner, H. (2013). Project management: A system approach to planning, scheduling, and controlling. New York: Van Nostrand Reinhold.
- Li, H., Lu, W., & Huang, T. (2009). Rethinking project management and exploring virtual design and construction as a potential solution. Construction Management and Economics, 27(4), 363–371. DOI:10.1080/01446190902838217
- Longva, T., Eide, M. S., & Skjong, R. (2010). *Determining a required energy efficiency design index level for new ships based on a cost-effectiveness criterion.* Maritime Policy & Management, 37*(2), 129–143.* DOI:10.1080/03088830903533759
- Makmur. (2013). Teori manajemen stratejik dalam pemerintahan dan pembangunan. Bandung: Refika Aditama.
- Mayston, D. J. (2015). Convexity, quality and efficiency in education. Journal of the Operational Research Society, 68(4), 446–455. DOI:10.1057/jors.2015.91
- Morris, P.W.G. (1994). The management of projects. London: Thomas Telford.
- Muslihati. (2012). Analisis biaya operasional kapal pada berbagai load faktor angkutan perintis Sulawesi Tenggara. Jurnal Akuntansi ILTEK, 7(14), 1013-1018.
- Parida, A., & Kumar, U. (2016). Maintenance performance measurement (MPM): Issues and challenges. Journal of Quality in Maintenance Engineering, 7(1), 239-251.
- Petroutsatou, K. (2019): A proposal of project management practices in public institutions through a comparative analysis of critical path method and critical chain. *International* Journal of Construction Management. DOI: 10.1080/15623599.2019.1619225
- Peukert, C. (2019). The next wave of digital technological change and the cultural industries. Journal of Cultural Economics 43(2), 189–210. DOI: 10.1007/s10824-018-9336-2.
- Schwalbe, K. (2016). Information technology project management. 8th edition. Boston: Cengage Learning
- Tzannatos, E. (2010). *Cost assessment of ship emission reduction methods at berth: the case of the Port of Piraeus, Greece.* Maritime Policy & Management, 37*(4), 427–445.* DOI:10.1080/03088839.2010.486655
- Witte, K. D., & López-Torres, L. (2017). Efficiency in education: A review of literature and a way forward. Journal of the Operational Research Society, 68(4), 339–363. DOI:10.1057/jors.2015.92

Cite This Article: Aris Priyanto *et al* (2021). Analysis of Project Management Implementation for Ship Docking Repair. *East African Scholars J Econ Bus Manag, 4*(7), 154-161.