

Analysis of People Hours (JO) on the BRS Ship Project and Ship Material Procurement Planning at PT PAL Indonesia Production Management Office Division

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Abstract

This paper analyzes the efficiency of man hours (JO) in the BRS shipbuilding project as well as material procurement planning at PT PAL Indonesia. The effectiveness of labor and material management is a key factor in the success of maritime projects. This study uses quantitative analysis method to calculate JO realization and supply chain management approach to design procurement strategy. The results show that careful JO planning can improve productivity and cost efficiency, while a structured procurement strategy helps reduce the risk of delays in production. By implementing proper project management, PT PAL Indonesia can optimize resources in the shipbuilding process.

Keywords: Man Hour (JO), Project Management, Material Procurement, BRS Ship, PT PAL Indonesia.

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This paper analyzes the efficiency of man-hours (JO) in the BRS shipbuilding project and material procurement planning at PT PAL Indonesia. The effectiveness of labor and material management is a key factor in the success of maritime projects. This study uses quantitative analysis method to calculate JO realization and supply chain management approach to design procurement strategy. The results show that careful JO planning can improve productivity and cost efficiency, while a structured procurement strategy helps reduce the risk of delays in production. By implementing proper project management, PT PAL Indonesia can optimize resources in the shipbuilding process.

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I. Introduction

In the current era of globalization, ship projects are one of the projects being promoted in the maritime industry. PT PAL Indonesia is the largest shipyard in shipbuilding. The BRS ship is a ship made by PT PAL Indonesia. BRS ships are a special type of ship designed to support or support the implementation of military operations and can help the community due to natural disasters, refugees, and provide humanitarian assistance and assist search and rescue in accidents. To ensure the success of the BRS ship project, a thorough process of project man-hours and effective procurement planning are required.

Planning and scheduling is one of the most important stages in the success of a project. According to Husen (in Febriana & Aziz, 2021) project scheduling is one of the elements of planning results that can provide information about the plan schedule and project progress in terms of resource performance in the form of costs, labor, equipment, and materials. Project scheduling aims to predict the start time, completion time of a work activity, determine the duration of each job, determine the relationship between jobs both preceding and following, and evaluate by showing the critical trajectory of a construction project that must be implemented immediately (Faishol in Halimi, 2019).

In the project man-hour carried out by PT PAL Indonesia is the process of measuring and managing the time used in a BRS ship project. This is important to ensure that work is done efficiently, according to a predetermined schedule. By conducting project man-hours, project managers can identify potential time constraints and take the necessary actions to accelerate the BRS ship construction process. And by conducting project man hours the company can find out how long it takes to make a project.

In addition, procurement planning is also an important factor in the success of the BRS ship project. Procurement planning is a plan designed to manage the procurement of materials and equipment needed in the construction of BRS ships. By having careful procurement planning in the BRS ship project, it can avoid the risk of delays in the procurement of materials and equipment, thus ensuring the smooth construction process of the BRS ship.

To get quality human resources is certainly not instantly produced. So, it is important for organizations to make maximum efforts to get the quality of human resources needed. The effort that this organization can make is HR management in the hope of obtaining high productivity for the organization and company. In the context of project man-hours and procurement planning of the BRS ship project, careful planning is needed in every step. By applying careful planning and correct analysis techniques, project managers can obtain accurate and objective information to optimize the use of human resources and minimize risks in the procurement of materials and equipment.

Thus, conducting a study on "BRS Ship Project Man-hour Analysis and Procurement Planning" which are two very important aspects in the success of the BRS ship project. By conducting careful analysis and effective management of these two aspects, it is expected that the BRS ship project can be completed on time and in accordance with the expected quality standards.

II. Theoretical Foundation

Project Management

Project management is a systematic approach to planning, organizing, directing, and controlling human, financial, material, and time resources in a project with the aim of achieving predetermined results or deliverables. This process involves identifying potential risks, planning a detailed schedule, managing effective communication among all parties involved, as well as closely monitoring the progress of the project to ensure that the project is running according to the established plan. Project management also plays a role in ensuring that resources are used efficiently and that the project is completed on time and within the set budget.

People Hours (JO)

Work assignment is the distribution of the man-hour (JO) budget or estimated JO per month and the total JO for all ships to be built. This workload is the basis for planning and controlling labor hours, personnel, processes and subcontracted work.

Man-hours (JO) in the industrial world refer to the total working time required to complete a project. Project man-hours or man-hours for an entire vessel can be calculated on the basis of the Instructions for Workers (IPP). The creation of IPP comes from the Corporate Strategic Planning (PSP) division. The IPP is in the form of policy, total budget for man-hours (JO), material, expansion, SBLC, schedule integration

Many countries regulate the working week, to implement minimum breaks in a day, holidays in a year, and maximum working hours per week. Working hours between employees or People Hours (JO) are internal and external services. Internal services are permanent employees and non-permanent employees. External services, namely, subcontractors. In this case, working hours have a positive and significant effect on income, which means that the higher the working hours devoted to activities, the higher the opportunity to earn a large income.

Procurement Planning

According to Erly Suandy (2021) planning is a process of determining organizational goals and also presenting them more clearly with the various strategies, tactics, and operations needed to achieve the main objectives of the organization as a whole. According to George (2021) planning is a process of initiating various goals, strategic boundaries, policies, and also very detailed plans in achieving them, organizational achievements for implementing decisions and also including performance reviews and also feedback in terms of introducing a new plan cycle.

The provision of goods or services is mostly carried out by government and private agencies. This process is carried out to provide the goods and services needed in a particular agency or unit whose provision process starts from the planning stage of a need until the completion of all processes related to the fulfillment of these goods or services. Procurement of goods or services begins with sourcing, negotiating, ordering, receiving, and checking back after purchase either separately or simultaneously to make it more integrated.

According to Hikmah & Irjayanti, 2022 Procurement of goods and services is part of every flow of goods. Such as activities in meeting needs or in providing needs and supplying needs with provisions in a purchase contract to meet business needs, which in the procurement of goods and services affects the entire flow.

Procurement planning in this case is a plan for purchasing goods at PT PAL Indonesia to fulfill the ship production process. In PT PAL, the first step in planning the procurement of material goods is to determine the schedule when to buy the product, and determine the estimated arrival of the goods at the port of silver and at PT PAL. Determining the schedule for purchasing materials is based on the *use date*. *Use date* is the date the material is used. To determine the *use date* is also based on the master schedule. The master schedule is a thoroughly structured work plan used to organize and manage activities or tasks in a project, which is used as the main framework for directing the implementation of work, ensuring efficiency, and keeping all activities running according to a predetermined time.

In procurement planning there is also when it is necessary to make a PO, in the PO there are also various payment methods and how to determine the *cash out plan*. Because every company, including PT PAL itself has its own percentage to determine the *cash out plan*. PT PAL also purchases imported and local goods. In purchasing imported goods, of course, there are various regulations that PT PAL needs to carry out in accordance with *incoterms* 2020. *Incoterms* serves as a fundamental provision in trade in the world. This regulation is used as a daily trade guide that must be used in carrying out PO purchases.

III. Writing Method

This research uses a quantitative and descriptive approach with a case study method to analyze the effectiveness of the use of man-hours (JO) in the BRS shipbuilding project and material procurement planning at PT PAL Indonesia. This approach aims to provide an in-depth overview of labor efficiency and procurement strategies in supporting the success of maritime projects.

To ensure data validity and reliability, this study used data triangulation by comparing the results of observations, interviews, and documentation. In addition, cross-checking was carried out with the management of PT PAL Indonesia to ensure the accuracy of the information obtained. With this systematic research method, it is expected that the research results can provide useful recommendations for PT PAL Indonesia in improving labor efficiency and material procurement planning for the BRS shipbuilding project.

IV. Discussion

BRS Ship Project People Hours

The detailing of the project JO can be done after the project has been won or has a contract with PT PAL, the calculation of the project JO is based on the IPP (Work Implementation Instruction). Each worker has their own budget, among others:

- Internal budget
- External budget

The internal budget category is PKWTT and PKWT employees. The external budget category is subcontractors. Each category has its own budget.

To determine the number of JOs based on IPP in 1 project. Starting from the beginning to the completion in 1 project, you can use the formula:

JO Budget

Rate JO according to category

Calculating the Realization of People Hours in Support of the BRS Ship Project Production Process

The realization calculation in this case is the work progress of each part from start to finish 100% Figure1

Realization of Man Hours

In the BRS project work is divided into several work groups, among others:

- *Hull Construction* • *Electronic Outfitting*
- *Painting* • *Accommodation Outfitting*
- *Hull Outfitting* • *Outfitting Manufacturing*
- *Machinery Outfitting*

In the realization of people hours there are also ordinary hours and overtime hours. For the value of *JO I.H.S.C*, *JO NORMAL* and *JO REVISION* have been recorded in PT PAL's ERP (*Enterprise Resource Planning*) application which cannot be changed.

How to determine the total realization of JO in each work group. For example, finding the total Hull Construction group, among others:

- Total JO I.H.S.C Group Hull Construction = Regular JO + Overtime JO
- Total JO Normal Group Hull Construction = Regular JO + Overtime JO Normal JO = Main JO
- Total JO Revision Group Hull Construction = Regular JO + Overtime JO

The way to determine the % of *Hull Construction BUDGET* in JO realization can use the formula:

TOTAL GROUP Hull Construction

BUDGET JO Hull Construction

After all the values of each project are known, the next step is to calculate the total and grand total by adding up the results of each project that has been searched.

In addition to JO on the main work, in the realization of JO there is also JO assistance from other divisions, the JO Normal value is obtained from PT PAL's ERP (*Enterprise Resource Planning*) application. By recording the realization of JO, it can be seen how many JO plans are consumed in working on 1 ship project.

Procurement Plan Project X

The results of making a procurement plan from project X undertaken by PT PAL Indonesia are as follows:

Figure 1 Procurement Plan

Source: PT PAL Indonesia

The picture above is a *procurement plan* for project X undertaken by PT PAL Indonesia. *Procurement plan* is made as a reference for material procurement so that the required materials come according to production needs.

The functions of this *procurement plan* include the following:

- Design Division: as a basis for when to issue the *equipment list* and when to complete the engineering evaluation.
- PMO Division: when to issue M01.
- *Supply Chain* Division: as a basis for when to make inquiries, issuing Purchase Orders to monitoring goods arriving at PT PAL.
- *Treasury* Division: to prepare funds when it comes to DP & L/C.

Making a *procurement plan* requires *use date* data, which is the time the material will be used, issued by the Randal production analysis & evaluation bureau based on the *master schedule*. In addition, the *leadtime of* material production and material *delivery* is needed so that the estimated arrival will be right on target. For material items, it is taken based on IPP data issued by the Corporate Strategy Planning Division.

Steps in Creating Project X *Procurement Plan*

The steps to create a *procurement plan* for project X at PT PAL Indonesia are as follows:

1. Knowing the material items that will be used on the ship based on the IPP data issued by the Corporate Strategy Planning Division.
2. Knowing the *use date* of the material to be used from the production *master schedule* made by the analysis & evaluation bureau, production planning and control department.
3. Knowing the lead time of material production. This data is taken from vendor offers or based on material contracts from old projects that have been purchased.
4. Estimating the *delivery* time of materials to be ordered whether local or imported materials. For imported materials, it is determined whether the material is from Europe / USA or from Asia (based on the maker list contained in the ship contract).
5. Summing up the length of production time and material arrival as a reference for making the *procurement plan* stage.
6. Determine the duration and date of inspection of incoming materials. Material arrives to PT PAL Indonesia when the vendor comes from within the country, while the material will arrive at the port of silver when the vendor comes from abroad.
7. If the vendor is from overseas, specify the duration and date of the material reaching the port of Surabaya or *Cost, Insurance, and Freight*.
8. Determine the duration and date of materials to be delivered by vendors from local or international production sites or *Free on Board*.
9. Specify the duration and date of payment either *Down Payment* (DP) or *Letter of Credit* (LC).
10. Determine the duration and date of the material purchase or *Purchase Order* (PO).
11. Determine the duration and date of material purchase offers (*quotations*) to vendors or *inquiries*. *Quotation* is an offer document that contains product description and product price.
12. Determine the duration and date of M01 creation. This is the reference date for M01 creation from the production planning and control department.

Cash Out Plan

[illegible]

Figure 2. Cash Out Plan

(Source: PT PAL Indonesia)

Cash out plan in material procurement planning is a plan for spending funds to support the procurement activities of goods and services in a project. The *cash out plan* is used by the Treasury Division to prepare funding for a project per month until the project is completed. The *cash out plan* takes data from the *procurement plan* to determine when to pay *Down Payment (DP)* or *Letter of Credit (LC)*, while the value is taken from the budget listed in the IPP (Worker Implementation Instruction) issued by the PSP Division. In this cash out plan, it is assumed that the DP value for all materials is 15% in accordance with PT PAL policy.

Incoterms Applicable at PT PAL Indonesia

PT PAL Indonesia also conducts export and import activities. In implementing these activities, PT PAL Indonesia also applies several *incoterms* regulations. *Incoterms (International Commercial Terms)* which serves as a fundamental provision in trade in the world. It is used as a trade guide in exports and imports. As for some incoterms that PT PAL does daily in meeting the productivity of its shipbuilding business, among others:

EXW (*Ex Works*)

EXW is used when the seller provides the goods at their own location or a named place (workplace, factory or warehouse). The seller does not need to load the goods onto a pick-up vehicle or clear customs for export. EXW is often used to make an initial quote without any other additional costs.

DAP (*Delivered At Place*)

The seller is deemed to have delivered the goods when they have been loaded on a delivery vehicle at the arrival location and are ready for unloading at the stated destination. With this provision, the seller needs to manage all risks related to the delivery of the goods.

DDP (*Delivered Duty Paid*)

The seller is responsible for delivering the goods to the stated destination location in the buyer's country and paying all costs to get the goods to the destination, including customs duties and import taxes. The seller is not responsible for unloading.

FOB (*Free on Board*)

The seller delivers the goods up to the vessel designated by the buyer at the port named by the buyer. The risk of loss or damage to the goods as well as subsequent costs passes from the seller to the buyer when the goods arrive on board the vessel.

CIF (*Cost Insurance and Freight*)

Incoterms is similar to CFR, except that the seller must also have minimum insurance on the goods to protect the buyer's risk of damage or loss during shipment.

IV. Closing

Conclusion

Based on the results of the above discussion regarding JO projects and procurement planning. JO project is a calculation of people hours in one ship project. JO projects can be carried out after the project has won the tender and made a contract between PT PAL and the *customer*. *The budget* in the JO project and the realization of JO are contained in the IPP (Worker Implementation Instructions) made by the PSP division in coordination with the production division, especially in the production rental. The calculation of JO realization is the progress in the work in each part of the ship production, the realization starts from the beginning until 100% completion.

Procurement Plan is a plan for the material requirements needed in a project, which contains the date when the material is used. The basis for making a *Procurement Plan* is the *use date*, which contains the date the material is used. In the *procurement plan*, a *cash out plan* is also needed, which is a plan for spending funds to support material procurement activities at PT PAL Indonesia. In determining the *cash out plan*, PT PAL Indonesia also has its own standards. In addition, PT PAL Indonesia also applies EXW, DAP, DDP, FOB, and CIF *incoterms*. In this case, it is known that planning is very important in a business, in order to achieve the desired company goals.

Advice

With the existence of internship activities for 4 months with internship partner PT PAL Indonesia, the author has several suggestions for internship partners, including:

1. It is hoped that internship partners can always be open to providing opportunities for students through internship activities in the future.
2. Providing coordination to the supervisor, related to the direction of activities that need to be carried out for OJT students so that students are not confused during the internship activities.
3. With the previous opportunity, the author hopes to maintain good communication and keep in touch with internship partners.

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