

Facility Development Planning at Fasharkan Lantamal V Surabaya based on Maintenance Strategy



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ABSTRACT: The role of the Indonesian Navy is as the main component of naval defense to carry out its duties based on political policies in upholding state sovereignty, defending NKRI territory, and carrying out Military Operations for War and Military Operations Other than War. In performing the main task, the elements used such as warships is often faced an obstacles related to the maintenance of their engines when experiencing problems or damage, which greatly affects the operational tasks they carry. The purpose of this study is (1) to identify factors that are the reason for the need to develop maintenance KRI machine workshop Fasharkan Lantamal V Surabaya; (2) to determine the priority weighting and development strategy plan of Maintenance KRI implemented by Fasharkan Lantamal V Surabaya to support the readiness of marine operations. The methodology used in this study is the mixed method. The data displayed is in tabulations or tables using qualitative descriptive analysis. Quantitative data is analyzed using Delphi-AHP. The results showed that the development strategy of Maintenance navy warships in supporting marine operations in the Fasharkan engine workshop Surabaya, carried out several stages, namely starting from the stage of identifying the reasons for the development strategy using Delphi Analysis. It conclude that several development criteria were obtained and subsequently weighting the order of criteria with AHP (Analytical Hierarchy Process). The top priority in this development strategy is the scope of technology which includes cooperation with related parties in the development of Maintenance KRI by the machine workshop in Fasharkan Lantamal V Surabaya so that the strategy should be carried out by collaborating with related universities by conducting direct courses at Fasharkan Lantamal V Surabaya both theory and practice.

KEYWORDS: *Maintenance, Strategy, the Indonesian Navy, Fasharkan, AHP.*

1. INTRODUCTION

The necessity of a welfare navy ship is inevitable, and this demand is based on the immense sea area of Indonesia. Based on the United Nations Convention on the Law of the Sea (UNCLOS) on 10 December 1982 in Bay of Montego, Jamaica. Indonesia's exclusive economic zone is approximately 7,9 million square kilometers (William et al., 2011). Moreover, according to the (Undang-Undang Republik Indonesia (UU RI) Nomor 34 Tahun 2004 Tentang TNI, 2004), Specifically on the Article 9 Paragraph B, the Navy's task is enforcing the law and protecting security in the sea area of the National Jurisdiction under the provisions ratified national law and international law. In this case, it has been explained that the Navy is in charge of enforcing the law in the territory of the National Jurisdiction, while the development of law enforcement that hijacking of ships can occur outside the waters of the Jurisdiction National with global impact. The Navy's duties are based on the International law of UNCLOS 1982 gives authority to the Indonesian Navy to carry out tasks not only in the waters of National Jurisdiction but beyond the waters of the National Jurisdiction. In carrying out this task, the Indonesian Navy has carried out Military Operations. In addition to war based on the escalation of threats that occur. Development of a strategic environment that is influenced by Global, Regional and National as well has an impact on the threat of armed insurrection that the place where the crime of piracy occurs cannot be predicted, can occur within the waters of the National Jurisdiction and outside the waters National Jurisdiction.

Indonesian National Territory constitutes a land unit, a sea area, and an air territory unit enormous in natural resources. As an archipelagic country, it is very natural that the sea has a very important meaning for the State of Indonesia. Politically the sea can give birth to a concept of unity, and it is not only inward but also outward, as stated in UNCLOS 1982. The role of the Indonesian Navy is as follows: the main component of the defense of the marine dimension is to carry out its duties based on political policies in upholding state sovereignty, defend the territory of the Unitary State of the Republic of Indonesia (NKRI), Apart from that, the Navy also carries out military operations for War (OMP) and Military Operations Other Than War (OMSP). Based on this phenomenon, the Indonesian Navy uses all the strength of its warship fleet to carry out the main tasks the protecting the sovereignty of the Republic of Indonesia. In carrying out its main tasks, the elements often used experience problems related to Maintenance, Repair, or Overhaul of the engine when experiencing trouble or damage. It greatly affects the operational tasks, specifically on Indonesia Navy Warship (KRI).

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In addition, in the manufacturing environment, maintenance is a set of actions that must be completed according to a timetable (Fraser et al., 2015). Maintaining a high-quality environment. A full system is required to carry out an extremely complex task. Activity that is both complete and sequential and leads as requested so that manufacturing can operate at a high level while staying within the confines of the law a requirement (Baluch et al., 2010). The defense industry plays a crucial role in defense. As a result, it must also include the Indonesian military regarding independence. The defense industry's autonomy (Hartati et al., 2014). In the defense sector, independence means that The defense sector in the United States must be capable of doing so. Produce, maintain, operate, and be unaffected by the environment and other countries' embargoes and dictations. MRO stands for maintenance, repair, and overhaul. Action to keep track of, understand, and assure the age of defense and security and the standard of living are all factors to consider. One of the services obtained from the Defense Industry MRO stands for Maintenance, Repair, and Overhaul.

The Navy is capable of supporting the maintenance and repair of warship components. However, there are still significant challenges due to insufficient facilities and infrastructure, lack of work ethic, and human resource capabilities. The mission of Fasharkan Lantamal V Surabaya (Maintenance and Repair Facilities) is a work unit tasked with coordinating and carrying out repair and maintenance support for the KRI or units of the Indonesian Navy undergoing repairs in the Surabaya area. Fasharkan Lantamal V Surabaya faces several challenges in carrying out its functions and duties, including the current state of the Mechanical Workshop personnel (*Bengmes*) in Fasharkan V Surabaya compared to the ideal number following the List of Personnel Composition, as this Machine Workshop (*Bengmes*) has 63 people. However, according to research undertaken at the site, the Machine Workshop (*Bengmes*) now employs 24 individuals out of 63 workers. At the moment, *Bengmes* Fasharkan Lantamal V Surabaya staff cannot do several tasks, including engine repairs at the Medium Overhaul (MO) and General Overhaul (GO) levels, ship propeller production, and compressor repairs. Apart from that, based on the state of the existing infrastructure, the Machine Workshop owns 35 units in good condition, 14 units that are moderately damaged, 10 units, and 11 units that are seriously damaged.

Apart from that, one of the challenges Fasharkan Lantamal V faces is that if repairs are needed at the Depo level, they will be done by a third party, which greatly increases the vulnerability of the machinery being repaired a third party. In addition to the work being done outside Fasharkan Lantamal V Surabaya, there is also a lack of inherent supervision, making the confidentiality of warship machinery undergoing repairs vulnerable. Maintenance and repair is an activity in controlling, knowing, and ensuring the age of the defense and security apparatus and the quality of service obtained from the Defense Industry, one of which is the MRO industry. In supporting the defense industry in Indonesia, it is necessary to get MRO technology support from other industries related to the maintenance of defense equipment. Indonesia should have a good concept for the maintenance, repair, and overhaul of the defense industry.

Research conducted by Desember et al. (2020) about maintenance strategy development on an Indonesian Navy Warship showed that the main priority in this development strategy is the scope of technology, which includes collaboration with related parties in the effort to develop the KRI Maintenance by a machine shop at Fasharkan Lantamal V Surabaya. Hence, the strategy that must be implemented is to collaborate with universities, such as by holding a live course at Fasharkan Lantamal V Surabaya. With this priority, it is envisaged that Fasharkan Lantamal V Surabaya would be able to do Maintenance without contacting a third party, ensuring that the work is completed on time and that the warship engine's secrecy is preserved.

2. THEORY AND CONCEPT

Maintenance is a system of planned actions carried out by carrying out all operations and programs to ensure material longevity throughout its life cycle. A planned maintenance system is a systematic effort employed to ensure that an aircraft on a warship's degree of reliability can be used throughout its life cycle.

Furthermore, categorization by Desember et al. (2020) regarding maintenance is divided into two types: preventative maintenance (prevention) and corrective maintenance (correction) (correction). Corrective maintenance is performed in the event of a breakdown outside of preventive maintenance on an aircraft or material. Preventive maintenance is a maintenance system carried out on a rotating schedule or throughout an aircraft or material operation. Maintenance is classified into three categories based on the level of difficulty: (1) organic level maintenance, which is supported by the ability of the crew, materials, and equipment on board; (2) intermediate-level maintenance, which requires the ability of experts, materials, and equipment on board and must be supported by Fasharkan; and (3) depot-level maintenance, which is increasingly requiring the assistance of foreign navies. When the ship is in the programmatic lifetime period and is past the lifespan, enhanced capabilities include modernization.

Ahmad Muhtadi (2016) completed research named "Reliability-Based Ship Repair Implementation Study For Shipyard". The study's findings are as follows: There are two types of ship repair activities related to reliability: improvement process and improvement results. In terms of context reliability, neither can be said to be trustworthy. Because of the installation and application of reliability, there is still a limited amount of it. The probability of a shipyard repairing ships according to the request of the shipowner within the given period and conditions of usage is known as shipyard reliability. Shipyard reliability conditions on ship repair The current ship can be repaired utilizing the reliability approach in reliability analysis. It is a technique that uses a case-based approach to analyze the root causes of problems in the repairing process at the shipyard. Reliability analysis

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aims to determine the causes of unreliability based on ship repair implementation studies. It is carried out in the following stages: An examination of the owner's minutes of harm to ensure that the source of the problem of damage caused by unreliability in shipyard repair processes is identified. The ship's operational factors determine the Human Resources (HR) factors for defining the source of unreliability. Defining the material problem in the shipyard is the key to determining the cause of the unreliability. Determine the source of unreliability in the shipyard based on Factors, Facilities, and Infrastructure. Finding the cause of the unreliability by identifying Standard Operating Procedure (SOP) variables in the shipyard.

Yousef Alhouli (2011) from The University of Manchester developed a method named "Development of Performance Measurement Ship Maintenance, a Framework for Assessing Process Decision Making to Optimize on Ships". The findings of this study are a factor in ship maintenance planning. He achieved this by combining two methodologies: a literature review for general maintenance and ship maintenance. In addition, case studies on maritime shipping firms and interviews with major experts in the sector are being conducted. The choosing of these criteria has aided knowledge. The established framework contributes to knowledge of the new technique for measuring maintenance performance. It is a novel method for the ocean shipping sector, and it can aid the decision-making process in maintenance planning. The framework gives designers an important tool for assessing organizational maintenance performance. The necessity of giving a comprehensive assessment of maintenance in the organization is emphasized in this framework, which is based on the same ten criteria.

3. METHODS

Based on this research, the mixing method (Quantitative-Qualitative) was used for acquiring the data. The quantitative data was gained and analyzed by Delphi-AHP (Analytical Hierarchy Process) method. Then, the quantitative data is visualized by a descriptive qualitative approach. The author will use the interview process to get the data in gaining the qualitative research.

The Delphi method is a practical research method developed by RAND Corporation researchers in the 1950s for use in policymaking, organizational decision-making, and direct practice. While the Delphi approach has been used extensively in mixed methods studies, the Delphi technique has been used in significantly fewer qualitative studies. Even though the Delphi approach is useful in social science research, there is limited instruction on using it in theory development. In the context of Community-Engaged Research (CER) and mostly qualitative investigations (Brady, 2015).

AHP analysis or Analytical Hierarchy Process is an analytical method developed to find the order of priority or ranking of various alternatives contained in problem-solving efforts. This analysis was developed by Prof. Thomas Lorie Saaty of Wharton Business School. In complex circumstances, decision-making is influenced by many factors covering various levels and interests. So it is necessary to determine priorities and test the consistency of the various options available.

In this research, Delphi is being used to identify the criteria for the development strategy for maintenance, repair, and overhaul (MRO) aboard Indonesian Navy vessels in support of sea operations readiness. Meanwhile, AHP is utilized to calculate the weight of each criterion's priority scale generated using the Delphi technique. The descriptive results of the priority scale weights from the AHP approach are then used to identify the optimal alternative strategy for Maintenance on the Indonesian Navy Warship, which is expected to support sea operations readiness.

4. RESULTS AND DISCUSSION

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Furthermore, categorization by Desember et al. (2020) regarding maintenance is divided into two types: preventative maintenance (prevention) and corrective maintenance (correction) (correction). Corrective maintenance is performed in the event. Fasharkan Surabaya is one of the work units (Satker) located in the Main Base of the Indonesian Navy (Lantamal) V Surabaya.

Fasharkan Surabaya is one of the work units (Satker) located in the Main Base of the Indonesian Navy (Lantamal) V Surabaya. Fasharkan Surabaya has the main task of organizing and supporting maintenance and providing various repairs needed by the KRI or other elements of the Indonesian Navy in Surabaya. This task is carried out according to the abilities possessed in terms of facilities and infrastructure and the ability of Resources Human (HR) Personnel manning. Fasharkan Surabaya is a destination for carrying out research related to the Navy Warship Maintenance Development Strategy to support Marine Operation readiness. Fasharkan Surabaya is used as a research facility because the main task of Fasharkan Surabaya is a significant position in the implementation of the maintenance of the Navy Warships. Furthermore, the author focuses on analyzing the current condition of Fasharkan Surabaya in a machine shop. It includes an analysis of the tasks and functions of Fasharkan Surabaya, an analysis of the condition of human resources, and an analysis of workshop facilities at Fasharkan Surabaya.

4.1. Determination of Strategic Weights with AHP (Analytical Hierarchy process)

The next stage of this research is after processing the Delphi concept questionnaire data with four stages is to determine strategic priorities through the Analytical Hierarchy Process method and in the process of processing this data is carried out using

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the help of Excel Software, with the data processed is questionnaire data which is the perception of respondents/expert on criteria from the Strategy for Development of Maintenance, and Overhaul (MRO) of Indonesian Navy Warships in supporting marine operations activities. At this stage, a paired comparison weighting was carried out on the criteria for the development of Maintenance KRI, namely weighing between cooperation criteria with universities related to technology (X1), Human Resource Fulfillment according to the Personnel Composition List (X2), Improving the quality of Human Resources (X3), Cooperation with Defense Industry (X4), Improving Education and Training (X5).

Table 4.1. Criteria Normalization Matrix Results

Criterion	X1	X2	X3	X4	X5
X1	1	5	3	5	2
X2	0.2	1	0.25	4	0.5
X3	0.333333	4	1	5	1
X4	0.2	0.25	0.2	1	0.5
X5	0.5	2	1	2	1

(Source: Researcher's Results, 2019)

Based on the results of the total weight value in table 4.1 above, it can be known that the development strategy has a major influence in determining the development of *the Maintenance* of Navy Warships in support of marine operations is:

Table 4.2. Results of Paired Comparison Weighting Strategy Criteria/Priority Value

No	Code	Strategy	Weight
1	X1	Cooperation with Universities related to technology	0,42
2	X3	Improving the quality of Human Resources	0,23
3	X5	Improving Education and Training	0,18
4	X2	Fulfillment of Human Resources according to the Personnel Composition List	0,11
5	X4	Cooperation with the Defense Industry	0,06

(Source: Researcher's Results, 2019)

4.2. Strategy Formulation

After the results of various stages of analysis that have been carried out, the next step is to formulate a strategy for *The Development of Maintenance* of Navy Warships to support marine operations, including strategies for fulfilling Human Resources and improving its quality. Several The cooperation strategy in terms of improving the *maintenance* of navy warships was made so that the development of *Maintenance* of navy warships will be able to support marine operations. Here are recommendations for the formulation of the KRI *Maintenance* development strategy in Fasharkan Surabaya:

a. Human Resource Fulfillment Strategy

1) Carry out the fulfillment of Human Resources by the Personnel Array list and qualifications

Personnel recruitment cannot be separated from personnel planning activities in human resource management. The planning will know the necessary work, both qualitatively and quantitatively. Therefore, it is necessary to understand the importance of recruitment and planning in organizing management, both from the level of concept, function, purpose, and benefits. Paying attention to the description of the profession's capabilities and specifications, which is information rather than human resource goals needed or needed by the organization in the selection process, directs the clarity of human resource targets desired or needed by the TNI AL organization.

b. Human Resource Quality Improvement Strategy

1) Improve human resources capabilities by carrying out training and education in technological science

With the development of science and technology in shipping today, human resources are needed who are professionals in their fields. The leadership of the Navy in realizing the *World Class Navy* wants to increase its human resources so that there is a

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lot of cooperation in the field of education and training. Through various undergraduate, postgraduate, and doctoral education programs and professional training, it is hoped that TNI al personnel can be empowered in the place of service.

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c. Kri Maintenance, Repair, And Overhaul (MRO) improvement technology strategy

By analyzing the current conditions that have been described earlier. The author can give the expected advice, namely as follows:

1) Update equipment with the latest technological advances

Nowadays, technology has developed very rapidly, and the sophistication of today's technology. The need for technology has a huge impact on human life in various activities. Improving the quality of life requires humans to carry out various activities needed by optimizing their resources.

Efforts to improve the ability and use of technology through implementing strategies and learning methods that are systematically and comprehensively integrated. The improvement of capabilities and use is an important element in supporting the implementation of the basic duties of the Navy along with the development of shipping technology today.

2) Increases Slipway capability to 500 tons of docking up to 5000 DWT

The slipway facility currently has a capability of 300 tons and is limited to carrying out 40-meter PC-class docking. The current conditions need to be improved so that it can carry out KRI repairs by the capacity and weight of KRI owned by the Indonesian Navy.

3) Build graving docks up to 5000 DWT capability

A Graving dock is a place to carry out ship repairs in the form of ponds. In carrying out repairs or maintenance of ships, the graving docks also need facilities to support their operations. The construction of graving docks up to a capability capacity of 5000 DWT is expected that all ships in the Navy can be repaired. The obstacle in the construction of the graving dock is the required naturalness of the groove on the lip of the dock. The cost of making is relatively expensive.

4) Procurement of aluminum welding equipment to support the procurement policy of aluminum vessels

Steel is the main material commonly used in shipbuilding in addition to wood. However, if the steel material is used for shipbuilding with a relatively small size and requires high speed, it is considered less effective because it requires a larger propulsion engine. Nevertheless, ships built from aluminum materials are more suitable for this type. The habit of the leadership in the procurement of new ships currently leads to the manufacture of aluminum materials. Fasharkan Lantamal V currently has a hangar for aluminum ships but is not equipped with supporting equipment. In the future, it is necessary to procure equipment that supports the process of manufacturing and maintaining aluminum vessels to support the development of Fasharkan.

5) Establish cooperation with domestic shipyards in the construction and repair of KRI

Along with its development, the leadership has now opened more opportunities for agencies to develop themselves in the independence of defense equipment. There are opportunities to improve and develop professionalism through Memorandum Of Understanding (MOU) cooperation between navy shipyard, state-owned enterprise shipyard, or private shipyard company. By establishing cooperation, there will be a transfer of knowledge and skills. It could create independencies of the defense equipment from the start of production planning until manufacturing, also up to the maintenance of the equipment itself.

6) Carrying out technology transfer by shipping industry policies and shipping technology

In the procurement of defense support facilities, the Indonesian Navy requires an adequate budget for maintaining the defense readiness component at sea. Industrial capabilities are limited, but the defense equipment readiness is completely urgent that it can't be improved and forced to hold such equipment even though there is insufficient technology transfer.

In the long run, conditions like this need to be addressed with the possibility of more technology transfer. The problem of technology is not static and will continue to grow. As soon as the confidential information of one technology is provided, new technology has already appeared. The old technology became obsolete, and so on. As a user of technology, it is a loss and a waste. But for research and industry groups, this is valuable information for technology development.

7) Fasharkan development in line with shipping industry development policy

The main problem in the development of Fasharkan and the defense industry lies in the weak regulation of the defense acquisition system that accommodates the process of absorption of its technology. As long as the fundamental problem is not resolved, the development of the SOE shipyard industry will not improve significantly. For this reason, a solution that focuses on directly addressing these problems is needed. On the one hand, the defense industry will not advance if there is no government and TNI as users. TNI and the defense industry work together through research, development, and engineering to advance skills in technological innovation. At the same time, the government supports the defense industry and collaboration with Indonesian universities.

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The national industry has a strategic role that can play a role in developing defense and security technology and affect national economic growth. According to the Minimum Essential Force (MEF), the implementation of posture development requires synergistic alignment between technology users, research and development institutions, universities, and industry to encourage acceleration towards national independence in defense. The development of Fasharkan Surabaya is in line with government policies in strengthening the domestic shipping industry and the independence of the defense equipment, also the government programs of the world's maritime axis and marine toll program. It also requires personnel fulfillment and an increased ability to master agility technology. Fasharkan's development should be in line with government and defense industry policies so that there is sustainability in the development and independence of defense technology. As for catching up with some technology lag, it is necessary to transfer technology from developed countries with cooperation in making the latest equipment. Furthermore, the development of Fasharkan must also pay attention to the direction of the leader's policy in the procurement of equipment.

The development of Fasharkan Surabaya cannot be separated from the demands of its duties and the functions to prepare the KRI for supporting the operational tasks, both war operations and outside war operations. The fulfillment of Human Resources in Fasharkan is adjusted to the competence, expertise, and profession of the Human Resources itself, following the current Personnel Array List needs. It will certainly have a positive impact on the ability of Fasharkans to carry out their main tasks in preparing KRI.

The development of workshop equipment with the latest technology and the procurement of aluminum welding support equipment is a new demand based on the leader's policy in preparing the latest equipment. The development of agility technology is something that must be anticipated. It demands preparation in carrying out equipment treatment in the future, considering that maintaining the equipment's sustainability needs regular maintenance. For this reason, the construction of equipment following the latest agility technology needs to be prepared supporting facilities in carrying out maintenance and repair of equipment in the future.

The government policy has launched seven main policy programs from the Defense Industry Policy Committee (KKIP) as a stage of defense independence. But some technologies that cannot be made domestically are still allowed for foreign procurement with the condition of technology transfer cooperation. The government's policy is in line with the empowerment of the shipping industry. It is a reference to developing defense independence in the future with the mastery of the latest agility technology. The policy assistance related to the independencies of defense equipment is necessary to increase the ability of Human Resources by carrying out the training and education for faculty members. It is believed that the training will increase the ability of personnel to carry out KRI maintenance at the depot level.

4.3. Implementation Stages

The plan for the development stages of Fasharkan Surabaya is generally carried out in one strategy plan (renstra), which is divided into a five-year program. The first and second year is the basic foundation development phase to create conditions where the policy policy of the leadership in the development of Fasharkan and prepared Human Resources as the referee of Fasharkan. In this phase, it is also expected that supporting facilities have been prepared to support Fasharkan Surabaya's development.

The second phase consists of the third and fourth years, which is the stage of restructuring Fasharkan Surabaya. This phase began to be done to increase the ability of personnel to master agility technology in supporting the independence of defense equipment. Besides that, I Also implemented changes and replacements for some development programs that are no longer relevant to the existing situational dynamics. At this stage, efforts were also made to improve and develop the ability and strength of Fasharkan Surabaya.

The third phase, namely in the fifth year, is a stage of reaping the results of several previous stages. This result can increase the ability and strength of Fasharkan Surabaya. However, at this stage, it is still necessary to conduct an evaluation study of several sub-programs that have been implemented and how the impact of the implementation of the program on the development of Fasharkan. The purpose of this process is a *roadmap* or plan map in the form of a five-year strategic document containing an explanation of the organizational goals to be achieved as well as future estimates, how the implementation stage, and what steps will be taken to achieve the development goals of Fasharkan Surabaya as stated in table 4.3.

Table 4.3. Fasharkan Surabaya Development Table

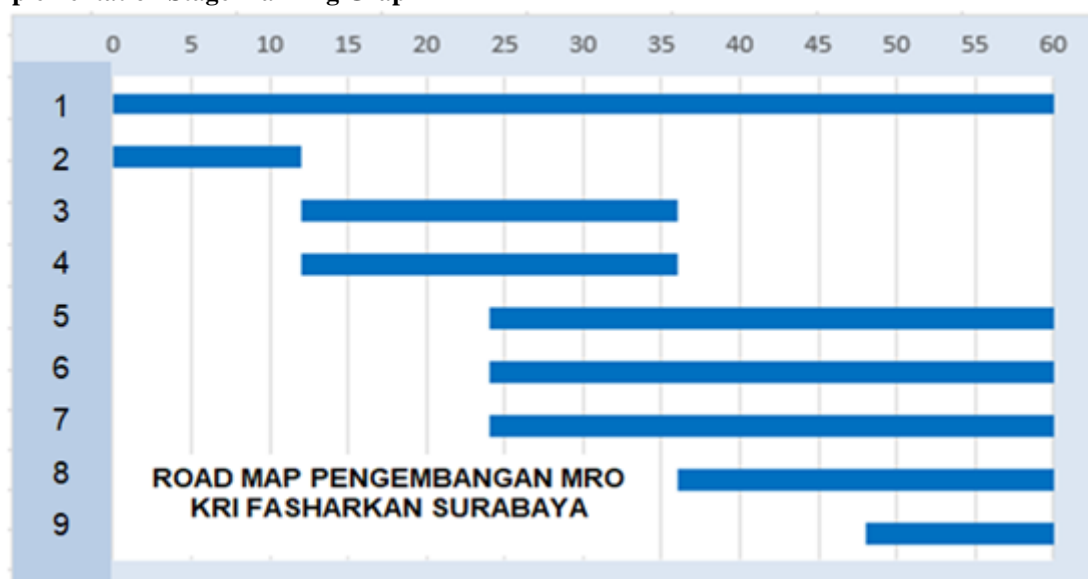
Fasharkan Surabaya Development			Road Map (month)		
No	Code	Strategy Steps	Time	Begin	Finish
1		Carrying out HR fulfillment following customized qualifications with existing DSPs	60	0	60
2		Procurement of aluminum welding equipment to support ship procurement policy aluminum;	12	6	18
		Workshop equipment upgrade			

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3		with the adaptation of the latest technology;	24	12	36
4		Improving abilities slipway up to 500 Tons	24	24	48
5		Improving HR capabilities by carrying out training and Ipengtek Education	36	24	60
6		Establish cooperation with the domestic-related shipping industry in the development and KRI repair	36	24	60
7		Carrying out technology transfer under shipping and navy technology industry policies	36	24	60
8		Building a graving dock up to 5000 DWT capability	24	36	60
9		Fasharkan development aligned with procurement policy the latest equipment.	12	48	60

(Source: Researcher's Results, 2019)

Table 4.4. Implementation Stage Planning Graph



(Source: Data Processor Researcher, 2019)

5. CONCLUSION

Maintenance is a system of planned actions carried out by carrying out all operations and programs to ensure material longevity throughout its life cycle. A planned maintenance system is a systematic effort employed to ensure that an aircraft on a warship's reliability can be used throughout its life cycle.

Furthermore, categorization by Desember et al. (2020) regarding maintenance is divided into two types: preventative maintenance (prevention) and corrective maintenance (correction) (correction). Corrective maintenance is performed in the event. In the weighting of strategic priorities using the AHP concept, there were five strategies that influential on the development of KRI Maintenance by the Fasharkan Lantamal V Surabaya machine shop, namely:

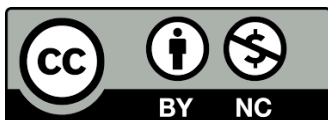
- 1) Cooperation with Universities related to technology with the highest weight of 0.42.
- 2) Improving the quality of Human Resources with a weight of 0.23.
- 3) Improving Education and Training with a weight of 0.18.
- 4) Fulfillment of Human Resources according to the List of Personnel Composition with a weight of 0.11.
- 5) Cooperation with the defense industry with weight

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Based on the weight value, what becomes The main priority in this development strategy is the scope of technology which includes cooperation with related parties to develop the KRI Maintenance by the engine workshop at Fasharkan Lantamal V Surabaya. So the strategy that must be carried out is by collaborating with universities related to how to hold direct courses at Fasharkan Lantamal V, both theory and practice, with the intention that with limited personnel but having more capabilities, each individual in carrying out their duties. From these priorities, it is expected that Fasharkan Lantamal V Surabaya can carry out Maintenance independently without involving third parties, so that the work results are as expected. The confidentiality of warship engines can be maintained.

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