



The Effect of Plan Maintenance System and Crew Readiness on the Smooth Operation of MV. Asike Global at PT. Pelayaran Korindo Jakarta

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ABSTRACT

In ensuring the safety of shipping as a support for the smooth running of ship traffic at sea, it is necessary to have a crew member who is skilled, capable, and skilled. The purpose of this study is to determine the effect of the plan maintenance system and the readiness of the crew on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta. The method used in this study was descriptive quantitative, where the sample used was 30 people. Sampling technique with saturated sampling. The type of data used is primary and secondary data, where primary data is obtained from questionnaires while secondary from literature and books. Data analysis techniques use Likert scale weighting, regression analysis, correlation coefficient analysis, determinant coefficient analysis, and hypothesis testing both simple and multiple. Based on the analysis and discussion, it shows that there is a positive and significant influence of the plan maintenance system on the smooth running of operations, there is a positive and significant influence of the readiness of the crew on the smooth operation, there is a positive and significant influence of the plan maintenance system and the readiness of the crew on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta.

Keywords: Plan Maintenance System, Crew Readiness, Smooth Operation.

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Introduction

Indonesia is a maritime country, the reason why Indonesia is called a maritime country is that the water area in Indonesia is wider than its land. Indonesia has about 17,499 islands, with a coastline of 81,000 km (the second longest after Canada) with a very strategic geographical location having a seascape that is up to 2/3 the area of the entire territory of the Unitary State of the Republic (Martini, 2017). Indonesia needs to position itself as a leader and create national policies in the maritime sector based on its geographical conditions (Emmers, 2014).

With such geographical conditions, the role of sea transportation for Indonesia is very strategic and vital, not only from the economic aspect, but also from the ideological, political, social, and cultural aspects as well as defense and security (Widowati et al., 2015). One of the companies that have a fleet of ships that meet these aspects is PT. Pelayaran Korindo Jakarta. Company Pelayaran Korindo Jakarta is one of the companies engaged in providing sea transportation services by operating various types of cargo ships and tankers that serve domestic routes to all major ports in Indonesia. In carrying out business in the shipping industry of Pelayaran Korindo Jakarta has a vision and mission. The mission of PT. Pelayaran Korindo Jakarta is a team with successful people, doing 100% in the process and working with '10 Cultures', in priority mutually beneficial partnerships with customers to provide reliable and quality shipping and shipping vessels.

Crew members are required to understand the functions and benefits of the Plan Maintenance System (Stanivuk et al., 2021). By understanding this, the crew will understand the reason why they carry out routines that are carried out together, such as cleaning coolers, cleaning filters, checking the machinery, and so on (Pratama et al., 2022). The purpose of ship maintenance is to ensure the implementation of a planned maintenance system on ships that meet the requirements, of government regulations (Statutory) referring to the IMO (International Maritime Organization) Convention, namely: Safety of Life at Sea (SOLAS) & Marine Pollution (MARPOL) (Subekti et al., 2022). The implementation of maintenance serves to maintain optimal engine performance. Care work to be effective should be carried out thoroughly and regularly. It is necessary to have a detailed schedule of parts of the main machine, to facilitate the implementation of maintenance activities. Distance and time in carrying out maintenance is only common standard. To facilitate data collection, maintenance like this is poured in the form of a Plan Maintenance System. Plan Maintenance System describes the plan of work to be carried out. For this reason, its implementation requires an understanding and skilled crew (Purba & Sugiharto, 2019).

The skilled crew is crew members who can use a combination of Hard skills and Soft skills so that their duties and responsibilities are achieved on board, including the implementation of the Plan Maintenance System. The ship is a small scope, limited in area, and the number of crew members is limited. The number of crew members generally ranges from 20 to 30 people. Every day the crew of the ship meets the same person. Feelings of boredom, work pressure, limited scope, and distance from family cause the crew to need Soft skills. The implementation of the Plan Maintenance System requires teamwork, meaning that the implementation of the Plan Maintenance System requires soft skills.

Incidents of ship damage to the PT. Pelayaran Korindo Jakarta shows that the Plan Maintenance System is not carried out properly. Some of the reasons for not implementing the Plan Maintenance System properly are 1). The frequency of work is sometimes so high that it results in the cost of carrying out ship maintenance and repairs being very large or often close to the same level of cost as the construction of a new ship; 2). Low understanding of the crew towards the Plan Maintenance System. And the lack of Soft skills resulted in the crew not being able to cooperate optimally in carrying out maintenance by the Plan Maintenance System.



In addition, referring to the SOLAS (Safety of Life At Sea) regulations, the crew of the ship is required to be prepared to face the worst situation, namely fire (Joseph & Dalaklis, 2021). For this reason, the crew of the ship is required to carry out training to deal with fire events. The purpose of carrying out fire training is so that all crew members are ready to respond to fire emergencies, both in terms of mentality, duties, responsibilities, and familiarity with the layout and equipment of the fire department (Marta, 2016). The fire emergency readiness of the crew is still considered low, this can be seen when dealing with the M/E Scavenging fire incident on the ship. 1st Engineer followed by his subordinates seemed less familiar with taking action to tackle the M/E Scavenging fire so that the fire had spread over the surface of the engine body. Therefore, researchers are interested in raising issues related to the influence of plan maintenance system and the readiness of the crew on the smooth operation of the MV. Asike Global on PT. Pelayaran Korindo Jakarta In 2021.

Literature Review

Plan Maintenance System is pre-planned maintenance based on the Manual Instruction Book of each engine or aircraft. Maintenance is carried out based on the working hours that have been achieved, although the condition of the material is still good, it still has to be replaced new (Handoyo, 2015). Maintenance that has already prepared spare parts, so that damage can be repaired as soon as possible and prevent disruption of ship operations. The operation of a ship as a means of transportation will go through various conditions both caused by natural factors and caused by environmental conditions, this can result in the ship experiencing damage to its construction and ship equipment as a supporting item in operation.

Fiyanzar et al., (2016) namely: "Maintenance is an activity to maintain or maintain factory facilities or equipment and carry out repairs or adjustments or replacements needed so that there is a satisfactory state of production operation by what is planned". So it can be concluded that maintenance is carried out to maintain or repair equipment or other facilities, to remain in good condition that is always ready to use so that the production process can be satisfactory. The Role of Maintenance in Operations Management In business activities, the role of maintenance is very important, including in planning and controlling operations, where one of the activities of planning and controlling operations is to determine the work of certain machinery to fit the predetermined path. Maintenance activities are quite complicated activities because it concerns the success of the operation process. Failure to carry out maintenance activities is the jamming of one of the series of operating processes that can hinder the company's subsequent operations.

Drever (in Slameto, (1988)) suggests readiness is preparedness to respond or react is defined as a willingness to respond and react. This willingness is generated from within the individual and is related to maturity because maturity means readiness to carry out skills. Wiweko et al., (2015) state: "A crew member is a person employed in any capacity on a seagoing ship or a ship used for commercial shipping at sea owned by individuals or public companies, other than warships. Crew Readiness is an overall condition possessed by individuals or groups on board the ship, both Nahkoda, ship officers (Deck dept and Engine dept.), and crew in readiness to carry out a job and their responsibility to achieve certain activities.

According to Heizer & Render, (2006), operational management is a set of activities that generate value in the form of goods and services by converting inputs into outputs. According to Annarelli & Nonino, (2016) The general principles of operations management include several

activities, including the division of duties among members in the work units of the port organization, the need for discipline, observance of rules, responsibility, and authority so that the control process is by the guidelines to achieve goals. Reasonable rewards and penalties according to needs, carrying out work by priorities, innovation, togetherness and safety in work. The process of controlling port activities by the port apparatus and the community.

Methods

The method used in this study was descriptive quantitative, where the sample used was 30 people with a sampling technique with saturated sampling (Zook & Pearce, 2018). The type of data collection is qualitative data with a quantitative approach using questionnaire data and interviews regarding the plan maintenance system, the readiness of the crew, and smooth operation. Data analysis techniques use Likert scale weighting, regression analysis, correlation coefficient analysis, determinant coefficient analysis and hypothesis testing both simply and multiply. Based on the analysis and discussion, it shows that there is a positive and significant influence of a plan maintenance system on the smooth running of operations, there is a positive and significant influence on the readiness of the crew for the smooth operation, there is a positive and significant influence of plan maintenance system and the readiness of the crew on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta.

In this study, there were three variables, two free variations, namely Plan maintenance system (X_1) and crew readiness (X_2), and operational smoothness (Y), with a choice of answers: Strongly Agree (SA), Agree (A), Simply Agree (SiA), Disagree (D) and Strongly Disagree (SD)

1. Plan maintenance system (X_1)

Plan maintenance system is a question related to the efforts made in the context of maintenance or maintenance both comprehensive and periodic maintenance with indicators: Planned maintenance and Unplanned maintenance.

2. Readiness of ship crews (X_2)

Readiness is a question related to the readiness of both humans and management in this case human beings and management: Readiness In terms of Operational Governance and Readiness indicators are appointed from Infrastructure.

3. Operational smoothness (Y)

Ship operations are management applied in a ship or port environment. But the operational management of the ship must also be applied to the work activities of the crew or to other programs whose work is engaged in and within the port, with indicators: decisions, functions or uses, and processes.

The validity test is used to determine whether a questionnaire is valid or not. A questionnaire is said to be valid if the questions on the questionnaire can reveal something that the questionnaire will measure, Ghozali in Pertiwi et al., (2021). A reliability Test is a tool for measuring a questionnaire that is an indicator of a variable or constructs. A questionnaire is said to be reliable if one's answer to a statement is consistent or stable over time. The method used to test the reliability of the questionnaire in this study was to measure reliability with the Cronbach Alpha statistical test (Astriawati, 2016). To find out if the questionnaire is reliable, a questionnaire reliability test will be carried out with the help of the SPSS computer program.

Hypothesis Testing

H₁: The effect of the plan maintenance system on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta

H₂: The effect of the readiness of the crew on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta

H₃: The effect of the plan maintenance system and the readiness of the crew together on the



smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta.

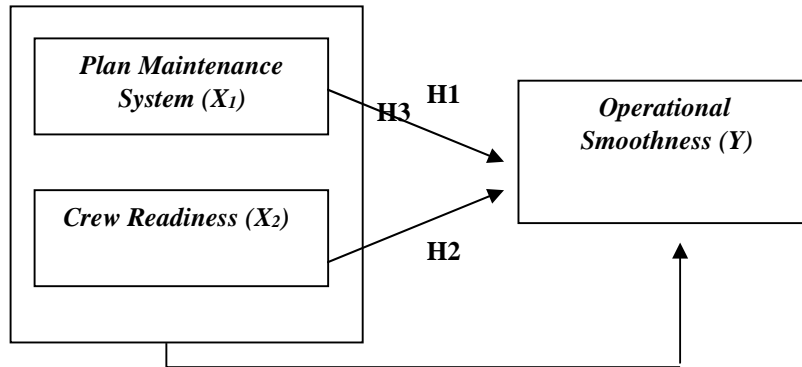


Figure 1. Frame of Mind

Result and Discussion

Result

The data on the distribution of respondents' answers according to the plan maintenance system variable (X_1) and the crew readiness variable (X_2) as well as the operational smoothness variable (Y) are as follows:

1. Plan Maintenance Variables (X_1)

Data on the variable score of the plan maintenance was collected by a questionnaire method consisting of 10 questions. Furthermore, the plan maintenance score presented in the histogram is as shown below:

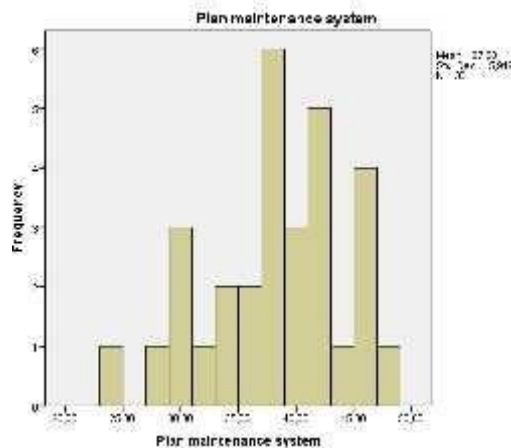


Figure 2. Histogram Variable Frequency Plan Maintenance System

The following is presented a table on the analysis of the Statement Weights of Respondents Plan Maintenance Variables (X_1)

Table 1. Weight Analysis of Respondent Statement Variable X_1

| Statement | SA | A | SiA | DA | SD | Total Weight | Average Weight Rating |
|------------|-----|-----|-----|-----|----|--------------|-----------------------|
| 1. | 40 | 60 | 0 | 6 | 4 | 110 | 3,67 |
| 2. | 70 | 40 | 0 | 12 | 0 | 122 | 4,07 |
| 3. | 65 | 68 | 0 | 0 | 0 | 133 | 4,43 |
| 4. | 60 | 60 | 0 | 6 | 0 | 126 | 4,20 |
| 5. | 5 | 48 | 0 | 20 | 7 | 80 | 2,67 |
| 6. | 65 | 64 | 0 | 2 | 0 | 131 | 4,37 |
| 7. | 40 | 60 | 0 | 10 | 2 | 112 | 3,73 |
| 8. | 35 | 56 | 0 | 14 | 2 | 107 | 3,57 |
| 9. | 15 | 84 | 0 | 10 | 1 | 110 | 3,67 |
| 10. | 20 | 64 | 0 | 20 | 0 | 104 | 3,47 |
| Sum | 415 | 604 | 0 | 100 | 16 | 1135 | 3,78 |

2. Crew Readiness Variables (X_2)

Data on crew readiness variable scores were collected by a questionnaire method consisting of 10 question items. To describe the frequency of the results of the research data on the readiness variables of the crew, it can be presented in the form of a Histogram Graph as follows:

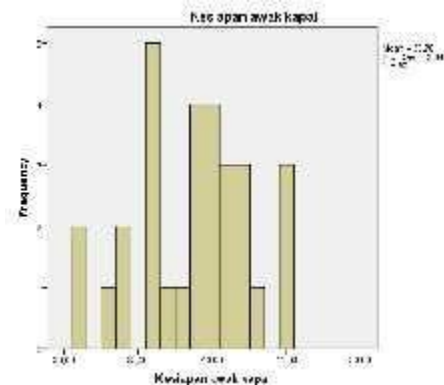


Figure 3. Crew readiness Variable Frequency Histogram

The following is presented a table on the analysis of the Statement Weights of Respondents Crew readiness Variables (X_2)



Table 2. Weight Analysis of Respondent Statement Variable X₂

| Statement | SA | A | SiA | DA | SD | Total Weight | Average Weight Rating |
|------------|-----|-----|-----|----|----|--------------|-----------------------|
| 1. | 35 | 92 | 0 | 0 | 0 | 127 | 4,23 |
| 2. | 25 | 80 | 0 | 4 | 3 | 112 | 3,73 |
| 3. | 90 | 36 | 0 | 6 | 0 | 132 | 4,40 |
| 4. | 65 | 68 | 0 | 0 | 0 | 133 | 4,43 |
| 5. | 40 | 60 | 0 | 10 | 2 | 112 | 3,73 |
| 6. | 35 | 56 | 0 | 14 | 2 | 107 | 3,57 |
| 7. | 5 | 48 | 0 | 20 | 7 | 80 | 2,67 |
| 8. | 35 | 56 | 0 | 18 | 0 | 109 | 3,63 |
| 9. | 85 | 52 | 0 | 0 | 0 | 137 | 4,57 |
| 10. | 5 | 100 | 0 | 6 | 1 | 112 | 3,73 |
| Sum | 420 | 648 | 0 | 78 | 15 | 1161 | 3,87 |

3. Operational Smoothness Variables

Data on the operational smoothness variable scores were collected by a questionnaire method consisting of 10 questions. To describe the frequency of research data results of operational smoothness variables, it can be presented in the form of a Histogram Graph, as follows:

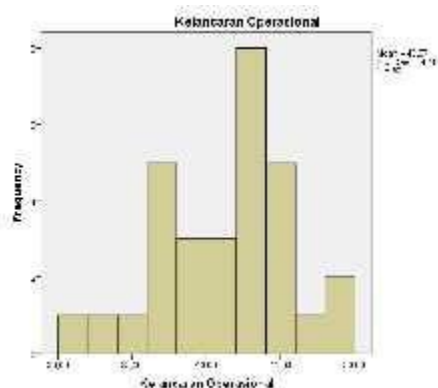


Figure 4. Operational Smooth Variable Frequency Histogram

The following is presented a table on the analysis of the Statement Weights of Respondents Operational Smooth Variables (X₃)

Table 3. Weight Analysis of Respondent Statement Variable X₃

| Statement | SA | A | SiA | DA | SD | Total Weight | Average Weight Rating |
|------------|-----|-----|-----|----|----|--------------|-----------------------|
| 1. | 25 | 80 | 0 | 4 | 3 | 112 | 3,73 |
| 2. | 90 | 36 | 0 | 6 | 0 | 132 | 4,40 |
| 3. | 70 | 40 | 0 | 12 | 0 | 122 | 4,07 |
| 4. | 65 | 68 | 0 | 0 | 0 | 133 | 4,43 |
| 5. | 40 | 60 | 0 | 10 | 2 | 112 | 3,73 |
| 6. | 35 | 56 | 0 | 14 | 2 | 107 | 3,57 |
| 7. | 15 | 84 | 0 | 10 | 1 | 110 | 3,67 |
| 8. | 85 | 48 | 0 | 2 | 0 | 135 | 4,50 |
| 9. | 60 | 72 | 0 | 0 | 0 | 132 | 4,40 |
| 10. | 85 | 40 | 0 | 6 | 0 | 131 | 4,37 |
| Sum | 570 | 584 | 0 | 64 | 8 | 1226 | 4,09 |

Discussion

1. The effect of the plan maintenance system on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta

- a. From the results of the research conducted, it is proven that there is a very strong and positive influence between the plan maintenance system on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta.
- b. From the calculation of SPSS 22.0, the calculation obtained was 5.894 with df 30-2 at $1/2 \alpha$ (0.05) obtained a ttable of 1.701. Thus the count is $5,894 > \text{ttable } 1,701.$, so it is clear H_0 was rejected and H_a was accepted. This shows that the variable plan maintenance system (X1) has a significant positive influence on the smooth operation (Y) of PT. Korindo Cruise Jakarta.

Based on the results of the average weight score of 3.78, it shows that the system maintenance plan is good, while the system maintenance plan has a positive and significant influence on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta. With a large influence of 55.4%, this shows that 55.4% of operational smoothness variables are determined by the variable plan maintenance system factor, while the remaining 44.6% is determined by other factors such as internal factors, weather, and others.

2. The effect of the readiness of the crew on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta

- a. From the results of the research conducted, it is proven that there is a very strong and positive influence on the readiness of the crew for the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta.
- b. With the help of the calculation of SPSS 22.0, the calculation obtained is 7,800. With df 30-2. On $1/2 \alpha$ (0.05) of 1.701. Thus the count is $7,800 > \text{ttable } 1,701$, so it is clear H_0 was rejected and H_a was accepted. This shows that the variable regression coefficient of crew readiness has a significant positive influence on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta.

Based on the results of the average weight score of 3.87, it shows that the readiness of the crew is good, while the readiness of the crew has a positive and significant influence on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta. With a magnitude of 68.5%, this shows that 68.5% of the marine inspector supervision variables (inspection officers)



operational smoothness are determined by variable factors of operational smoothness while the remaining 31.5% are determined by other factors such as internal factors, weather, and others.

3. The effect of the plan maintenance system and the readiness of the crew together on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta

- a. By conducting multiple linear regression analysis with the help of SPSS 22.0, it can be seen that the value of the correlation coefficient (r) = 0.844 which means that the relationship between the plan maintenance system variable (X_1) and the crew readiness variable (X_2) together with the operational smoothness variable (Y) is very strong and positive.
- b. Thus $F_{count} (33,557) > F_{table} (3,354)$, so it is clear H_0 was rejected and H_a was accepted. This shows that the regression model of the variable plan maintenance system and crew readiness is significant with the variable operational smoothness of the MV. Asike Global at PT. Korindo Cruise Jakarta.

Based on the results of the average weight score of 4.09, it shows that the operational smoothness is good, while the system maintenance plan and the readiness of the crew together have a positive and significant influence on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta. The coefficient of determination or R Square is 0.713. This shows that 71.3% of operational smoothness variables are determined by factors such as Variable plan maintenance system and variables of readiness of crew while the remaining 28.7% are determined by other factors such as internal factors, weather and others.

Conclusion and Suggestion

Based on the results of the average weight score of 3.78, it shows that the system maintenance plan is good, while the system maintenance plan has a positive and significant influence on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta. Based on the results of the average weight score of 3.87, it shows that the readiness of the crew is good, while the readiness of the crew has a positive and significant influence on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta. Based on the results of the average weight score of 4.09, it shows that the operational smoothness is good, while the system maintenance plan and the readiness of the crew together have a positive and significant influence on the smooth operation of the MV. Asike Global at PT. Korindo Cruise Jakarta.

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Reference

- Annarelli, A., & Nonino, F. (2016). Strategic And Operational Management Of Organizational Resilience: Current State Of Research And Future Directions. *Omega*, 62, 1–18.
- Astriawati, N. (2016). Penerapan Analisis Regresi Linier Berganda Untuk Menentukan Pengaruh Pelayanan Pendidikan Terhadap Efektifitas Belajar Taruna Di Akademi Maritim Yogyakarta. *Majalah Ilmiah Bahari Jogja*, XIV(Regresi Linier), 22–37. [Http://Jurnal.Amy.Ac.Id/Index.Php/MIBJ/Article/View/90/89](http://Jurnal.Amy.Ac.Id/Index.Php/MIBJ/Article/View/90/89)

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- Emmers, R. (2014). Indonesia's Role In ASEAN: A Case Of Incomplete And Sectorial Leadership. *The Pacific Review*, 27(4), 543–562.
- Fiyanzar, A. E., Nusraningrum, D., & Arofat, O. (2016). Penerapan Safety Management System Pada Lembaga Penyelenggara Pelayanan Navigasi Penerbangan Indonesia. *Jurnal Manajemen Transportasi & Logistik*, 3(2), 205–215.
- Handoyo, J. J. (2015). Manajemen Perawatan Kapal. *Jakarta: EGC*.
- Heizer, J., & Render, B. (2006). Operations Management Buku 2 Edisi Ke Tujuh. *Jakarta: Penerbit Salemba Empat*.
- Joseph, A., & Dalaklis, D. (2021). The International Convention For The Safety Of Life At Sea: Highlighting Interrelations Of Measures Towards Effective Risk Mitigation. *Journal Of International Maritime Safety, Environmental Affairs, And Shipping*, 5(1), 1–11.
- Marta, F. (2016). *Analisis Sistem Proteksi Penanggulangan Kebakaran Di Kapal Penumpang Kmp. Gambolo Pt. Asdp Indonesia Ferry Persero) Cabang Padang Tahun 2016*. Universitas Andalas.
- Martini, L. (2017). *Implementasi Keamanan Maritim Di Wilayah Alur Laut Kepulauan Indonesia Berdasarkan Unclos 1982 Menuju Indonesia Sebagai Negara Maritim*.
- Pertiwi, Y., Astriawati, N., Wibowo, W., & Kristianto, L. (2021). Moodle Virtual Class Effectivity Toward Cadets' Learning Motivation And Speaking Ability. *Ethical Lingua: Journal Of Language Teaching And Literature*, 8(2), 378–383.
- Pratama, A. A., Astriawati, N., Waluyo, P. S., & Wahyudiyana, R. (2022). Optimalisasi Perawatan Sistem Pendingin Mesin Utama Di Kapal MV. Nusantara Pelangi 101. *Majalah Ilmiah Bahari Jogja*, 20(1), 1–11.
- Purba, D., & Sugiharto, R. (2019). Penerapan Ship Maintenance System (Sms) Application Of The Ship Maintenance System (Sms). *Jurnal 7 Samudra*, 4(2).
- Slameto. (1988). *Belajar Dan Faktor-Faktor Yang Mempengaruhinya*. Bina Aksara.
- Stanivuk, T., Stazić, L., Vidović, F., & Bratić, K. (2021). Assessment Of The Concept Of The New Methodology For The Evaluation Of Ship Planned Maintenance System. *Transnav: International Journal On Marine Navigation And Safety Of Sea Transportation*, 15.
- Subkti, J., Wibowo, W., Astriawati, N., & Fadholy, M. H. (2022). Optimalisasi Perawatan Sistem Pendingin Mesin Utama Tipe Hansin GLU28AG Pada Kapal. *Dinamika Bahari*, 3(1), 60–68.
- Widowati, I. Y., Arsita, S. A., & Wiguna, G. P. (2015). *Elements Of Strategic National Defense In The State Maritime Indonesia*.
- Wiweko, A., Thamrin, M., & Edi, D. W. (2015). The Effect Of Vessel Seaworthiness And Crew's Competence On Marine Safety. *Jurnal Manajemen Transportasi & Logistik*, 2(3), 287–296.
- Zook, K. L., & Pearce, J. H. (2018). Quantitative Descriptive Analysis. In *Applied Sensory Analysis Of Foods* (Pp. 43–71). Routledge.