



## Influence Vessel Survey of Shipworthiness (Case Study of PT Makara Jaya Marine Client)

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**Abstract:** *In the offshore oil and gas industry in Indonesia is experiencing development , see the potential for very high demand for offshore installations, such as oil platforms, drilling rigs, etc. As a result, many shipping companies operate offshore vessels, in the activities of mining companies, and operating offshore oil drilling installations, a safety and security system is needed because this is an important factor that must be considered and becomes the basis for decision making in making decisions. determine seaworthiness in shipping, both in terms of facilities in the form of ships and infrastructure such as navigation systems and human resources involved in it, to reduce and minimize an accident on a ship. The purpose of this study is to find out how much influence the ship survey has on the ship's feasibility in the case of a client at PT Makara Jaya Marine. The approach method used is quantitative data , while data collection uses observation techniques, literature studies and questionnaires (questionnaires) so that the causes of problems can be found using quantitative data analysis techniques . The results showed that the effect of the ship survey on shipworthiness in the client case study at PT Makara Jaya Marine based on hypothesis testing with the t test, it was found that  $t \text{ count} = 11.169$  and after consulting with  $t$  table at a significant level of 5% and  $n = 28$  shows  $t \text{ table} = 2,048$ . Because  $t \text{ count}$  is in the rejection area of  $H_0$  ( $11,169 > 2,048$ ) then  $H_0$  is rejected and  $H_a$  is accepted. The results show that there is a low loading factor weight on the ship survey variable and the shipworthiness variable to overcome it by trying to improve the implementation of the shipworthiness survey in client company periodically to ensure the condition of the ship for safety.*

**Keyword:** Ship Survey, Shipworthiness, Offshore, shipworthiness.

## INTRODUCTION

Shipping services or sea transportation services are one part of transportation services that cannot be separated from other parts of transportation facilities and with their ability to be ready to face future changes that are organizing mass transportation. Can connect and reach regions with one another through waters, so that it has a strong potential to be developed and its role both nationally and internationally so as to be able to encourage and support national development in order to improve people's welfare in accordance with the mandate of Pancasila and the 1945 Constitution. However, in this case we need quality sea transportation in order to provide export and import services from domestic. According to the Central Statistics Agency (2020:26) "Visiting ships at Indonesian ports in 2020 reached 715.67 thousand or units consisting of several types of shipping companies, with a total volume of 1,608.07 million Gross Tonnage (GT), the average GT ships visiting ports in Indonesia reached 2.25 thousand".

The shipping service industry in Indonesia is growing, this is supported by its strategic geographical location which is very profitable in international trade so that it can be used as a business opportunity in the shipping service industry. Therefore, many domestic and foreign shipping companies are shipping goods by sea, in addition to relatively cheaper costs, more cargo is transported. But apart from this, we cannot serve or transport export goods because the country still relies on foreign ships. According to the Central Statistics Agency (2020:30-31) "the average annual increase in the volume of loading and unloading of domestic goods is 6.68% and 7.99%, while for overseas shipping it is 5.35% and 8.83%. Domestic loading and unloading volumes range from 151.42 million tons – 410.84 million tons, while the loading and unloading volumes range from 123.14 million tons – 382.84 million tons."

The offshore oil and gas industry in Indonesia is also developing, the offshore oil and gas industry is identical to its platform, namely an offshore platform is a structure or building built offshore to support exploration or exploitation of mining materials. By looking at the very high potential demand for offshore installations, such as oil platforms, drilling rigs, etc. This has resulted in many shipping companies operating ships such as Crew boats, Supply, Tug Boats, Barges and others as a means of shipping or transporting equipment/goods/supporting personnel offshore, there are several problems with loading/unloading patterns in the flow of sea and river flows. (Johnson W. Sutjipto: 2010) asserted that "the Implementing Agency for Upstream Oil and Gas Activities (BP Migas), the number of offshore vessels in Indonesia has reached 531 units. By the end of 2018, there were 468 Indonesian-flagged vessels, while 63 foreign-flagged vessels." And domestic cargo commodities have volumes in the form of: coal (80.68%), nickel (4.14%), sand (3.55%), cement (3.39%).

Based on the data above, due to the high demand for Crew Boats, Supply, Tug Boats, Barges and other vessels, in the activities of mining companies, and operating offshore oil drilling installations, a safety and security system is needed because this is an important factor that must be considered. be considered and become the basis for decision making in determining seaworthiness in shipping, both in terms of facilities in the form of ships and infrastructure such as navigation systems and human resources involved in it, to reduce and minimize an accident on a ship.

The occurrence of ship accidents such as sinking, burning, etc. are problems related to the safety and security of sea transportation. For the implementation of this improvement in shipping safety, the Directorate General of Sea Transportation has issued policies in preventing ship accidents such as making shipping notices about increasing shipping safety supervision for passenger ships, making announcements about weather conditions in Indonesia's waters, such as regarding the readiness for bad weather at sea. (Kadarisman Muh, 2017:179). It was recorded that in 2019-2021 there were accidents that occurred on average were drowning (37%), ran aground (13%), collisions (15%), fires (18%) and other types of

accidents (17%). (37%) human factors, (23%) technical errors, (38%) natural conditions and (2%) for other causes (Munawir, 2016:152).

Therefore, the shipowner company is obliged to survey its ship to an Independent Survey service company that provides the survey services needed to declare the ship's seaworthiness and become the basis for obtaining a ship's seaworthiness certificate. Shipworthiness requires that the ship's building and engine conditions are in good condition, the captain and crew are experienced and certified, equipment, stores and bunkers, as well as adequate and qualified security equipment, and the ship does not pollute the environment. According to the Shipping Law no. 17 of 2008, a ship is declared seaworthy if it is equipped with a Ship Safety certificate, a pollution certificate from a ship, a Load Line and loading certificate, a Gross Deed, a Marine Letter/Large Pass/Small Pass/River and Lake Pass, a certificate of Safety Management and Pollution Prevention from the Ship and Ship Security Management Certificate in accordance with the shipping area. If these conditions are not fulfilled, then the ship is not seaworthy.

PT Makara Jaya Marine, is one of the domestic national companies engaged in Ship Inspection and Engineering Consultant services for commercial vessels and offshore vessels which was established in 2011. PT Makara Jaya Marine is located at Rukan Avenue No. 8-153, Jakarta Garden City, East Jakarta. Services performed as Independent Marine Surveyor and Marine Engineering Consultant. This service is very much needed in the world of shipping so that shipping safety is increasing, which we both know lately that there have been many cases of sinking, burning, collisions, shipwrecks and others. Many factors are the cause of ship accidents, namely, due to negligence of ship companies that do not check ships. Makara Jaya Marine as a surveyor company has handled various clients such as Exxon Mobil, Sudjaca Palembang, Pertamina, Chevron Indonesia, Kanaya, Logindo, and many other companies.

## **METHOD**

### **Data Description**

In this chapter the author will discuss the problems or facts that occur and describe the description of the research variable data. PT MAKARA JAYA MARINE is a company engaged in the provision of ship survey services. PT Makara Jaya Marine was established based on the deed of establishment No.7 dated September 08, 2011 drawn up before a notary Rr. Y. Tutiek Setia Murni, SH., MH. In Jakarta. The deed of establishment has been approved by the Minister of Justice No. C-883.HT.03.02-TH.2002 dated July 1, 2002 according to the Decree of the Minister of Justice and Human Rights of the Republic of Indonesia, the company has obtained an operating license as a service company. To carry out its business activities, the company has obtained the following permits:

1. Limited Liability Company (PT) Registration Certificate No. 09.04.1.46.43043, which was obtained from the Satyu Pintu Integrated Service Implementation Unit, East Cakung Village.
2. Taxpayer Identification Number (NPWP) No. 31,377,294.9-043,000 Certificate of Company Domicile No. 119/27.1.0/031.75.06.1004/071.562/2016, which was obtained from Cakung Sub-district, East Cakung Sub-District, East Jakarta Administrative City.
3. Company Business License No. 490/24.1PM.7/31.75/-1, which was obtained from the East Jakarta City Administration One Stop Service Office.

PT MAKARA JAYA MARINE conducts ship survey activities which usually operate in ship and offshore survey work (Offshore marine / ship surveyor). Surveyors carry out inspection, research, and supervision of a ship or those related to maritime affairs both at home and abroad.

In relation to the length of time this company was established, this company is already growing. The parties that have used the services of PT Makara Jaya Marine are generally

companies that carry out offshore exploration activities, on-off hire, bunkers, or companies that own or insurance companies whose ships have an accident.

### **Research time**

The author conducted research while doing the Real Work Practice onshore Practice (PRADA) for 12 months starting from August 2020 to August 2021 starting on August 5, 2020 until August 3, 2021 at PT Makara Jaya Marine.

### **Research Place**

This research was conducted by the author at PT Makara Jaya Marine , Jakarta Garden City, Rukan Avenue Blok F No. 8-153, Jalan Raya Cakung Cilincing KM. 0.5 East Cakung, East Jakarta, DKI Jakarta 13910

### **Approach Method**

Based on the previous explanation, according to the author, the approach method used in writing this thesis is to use quantitative data methods. This quantitative method serves to understand the social context more broadly and deeply by using descriptive development, meaning that the author tries to describe a portrait of the problems that exist in the field and the influence of ship surveys on shipworthiness (case study client PT Makara Jaya Marine ) .

### **Data collection technique**

According to Sugiyono (2015: 193) in his book entitled "Educational Research Methods" states that data collection techniques are the most strategic step in research, because the main purpose of research is to obtain data. In discussing and researching a problem, it takes data related to the problem to be discussed, then compiled and analyzed, so that a clearer picture can be obtained and makes it easier for the author to solve the problem. To obtain data in compiling this thesis, the author uses data collection techniques using the following methods:

1. Observation; Observation as a data collection technique has specific characteristics when compared to other techniques, namely interviews and questionnaires. Data collection techniques with observation are used when research is related to human behavior, work processes, natural phenomena and if the respondents observed are not too large in the book entitled "Educational Research Methods" (Sugiyono, 2015:203). According to Sutrisno Hadi (1986) in Sugiyono (2015:203) with a book entitled "Educational Research Methods" states that observation is a complex process, a process composed of various biological and psychological processes. Two of the most important are the processes of observation and memory.
2. Literature review; Literature study is data collection by reading, viewing, researching, quoting, from books or references presented, input or consideration and comparisons about what can be seen from existing theories. This literature study aims to obtain the basics of theory with the problems to be discussed.
3. Questionnaire (Questionnaire); Questionnaire is a data collection technique that is done by giving a set of written questions to respondents to answer in the book "Educational Research Methods" (Sugiyono, 2015:199). Questionnaires are an efficient data collection technique if the researcher knows with certainty the variables to be measured and knows what to expect from the respondents.

### **Research subject**

The population in a study is a collection of objects that can be used as research sources in the form of objects, humans or events that occur as objects or research targets. The population is a generalization area consisting of objects/subjects that have certain quantities and characteristics determined by researchers to be studied and then conclusions are drawn (Sugiyono, 2015:117) with a book entitled "Educational research methods". The population in this study is a client at PT Makara Jaya Marine as many as 30 people, in this case what is meant is 1 person representing the 1 client company.

Saturated sampling is a sampling technique when all members of the population are used as samples. The sampling technique is when all members of the population are sampled, this is done when the population is relatively small, less than 30, or the research wants to make generalizations with very small errors. (Sugiyono, 2017:85) in a book entitled "Educational research methods". In this case, the sample in this study is a corporate client at PT Makara Jaya Marine.

## RESULTS AND DISCUSSION

### Instrument Test

#### Validity Test (Test of Validity)

According to Ghozali (2017) The test to determine whether it is significant or not is to compare the value of rcount with rtable. If rcount for each question item is positive and greater than rtable (rcount > rtable), then the items or questions or indicators are declared valid.

The significant test was carried out by comparing the calculated r value with the table r value for n, in this case the number of saturated samples, with a significance level of 5%. A statement is declared valid if the value of rcount which is the corrected item-total correlation value (in SPSS 23) is greater than rtable. In this case, the rtable is 0.361. If the result of rcount is greater than rtable, namely 0.361, then the data can be said to be valid.

**Table 1**  
**Item Validity**

No	Variable	Number of Items	Valid Items	Information
1	Ship Survey (X)	15	15	Valid
2	Shipworthiness (Y)	15	15	Valid

### Reliability Test

The instrument is said to be reliable if someone's answer to the question is consistent or stable from time to time, and a variable is said to be reliable if it gives Cronbach's Alpha value > 0.60 (Ghozali, 2017). Based on the level of reliability, the results of the reliability coefficient test ( $r_{\alpha}$ ) on the two instrument variables tested can be summarized in the table below:

**Table 2**  
**Reliability Test Results**

No	Variable	N	N of Items	Cronbach's Alpha	to t.
1	Ship Survey (X)	15	15	0.913	Reliable/High
2	Shipworthiness (Y)	15	15	0.919	Reliable/High

**Source: Primary data processed**

Based on the table above, it can be concluded that the Cronbach Alpha value for the Ship Survey variable (X) is  $0.913 > 0.60$ , so the questionnaire is declared reliable . And for

the Cronbach alpha value for the Shipworthiness variable of 0.919 > 0.60, the questionnaire is declared reliable.

**Data analysis**

**Simple Linear Regression Test**

		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.079	3.899		2.330	.027
	Survei Kapal	.814	.073	.904	11.189	.000

a. Dependent Variable: Kelayakan Kapal

Based on the SPSS output above, it can be seen that constant and X values are obtained for Unstandardized Coefficients. The constant value of the unstandardized coefficients (α) is 9.079, this number is a constant number which means that if there is a ship survey, the value of the ship's feasibility is 9.079. Meanwhile, the X value of the Unstandardized Coefficients (b) is 0.814, this figure means that for every additional 1 unit of the ship survey, there will be an increase in shipworthiness of 0.814. So that the simple regression equation obtained is as follows:

$$Y = 9.079 + 0.814 X$$

**Classic assumption test**

**Linearity Test**

The linearity test aims to determine whether two variables have a linear relationship or not significantly. The linearity test is shown by comparing the established significance with the significance obtained from the analysis (Sig). The results of the significance of 0.05 with = 0.05 indicates linearity.

			Sum of Squares	df	Mean Square	F	Sig.
Kelayakan kapal * Survei kapal	Between Groups	(Combined)	1504.500	19	79.184	10.392	.000
		Linearity	1290.950	1	1290.950	169.418	.000
		Deviation from Linearity	213.550	18	11.864	1.557	.240
	Within Groups		76.200	10	7.620		
	Total		1580.700	29			

Based on the table above, the results of the linearity test are known that the Sig. deviation from linearity value is 0.240 > 0.05. So it can be concluded that there is a linear relationship between ship surveys and shipworthiness.

**Normality test**

One Sample Kolmogorov Smirnov test, with the provision that if the significance value is above 5% or 0.05, the data has a normal distribution. Meanwhile, if the results of the Kolmogorov Smirnov One Sample test produce a significant value below 5% or 0.05, then the data does not have a normal distribution.

		Unstandardized Residual
N		30
Normal Parameters <sup>a,b</sup>	Mean	.0000000
	Std. Deviation	3.16091181
Most Extreme Differences	Absolute	.103
	Positive	.103
	Negative	-.102
Test Statistic		.103
Asymp. Sig. (2-tailed)		.200 <sup>c,d</sup>

- a. Test distribution is Normal.
- b. Calculated from data.
- c. Lilliefors Significance Correction.
- d. This is a lower bound of the true significance.

Based on the table above, the results of the One Sample Kolmogrov Test resulted in asymptotic significance of 0.200 greater than 0.05, it can be concluded that the data is normally distributed .

**Hypothesis testing**

**T Uji test**

The following results were found: From the results of the t-test analysis, it is known that there is a significant influence on the ship survey variable (X) and the shipworthiness variable (Y). This is evidenced by the results of the t-test calculation of 11.169, while the t-table is 2.048 at a significance level of 5% which means that Ha is accepted. In addition, the regression equation  $Y = 9.079 + 0.814X$  is also obtained. The equation is in accordance with the simple linear regression formula, namely  $Y = a + bX$ , where Y is the symbol of the dependent variable, a is a constant, b is the regression coefficient for the independent variable (X). So that it can be concluded from the results of the t test, there is an influence between the X variable on the Y variable, in other words accepting Ha, namely: There is an Effect of Ship Survey on Shipworthiness of the Company's Client at PT Makara Jaya Marine, and rejecting Ho, namely There is No Effect of Ship Survey on Shipworthiness The company's client at PT Makara Jaya Marine. Thus, a conclusion is drawn that the ship survey has a significant impact on the feasibility of the ship on the client .

**Coefficient of Determination**

The coefficient of determination is the portion of the total variation in the dependent variable that is explained by the variation in the independent variable.

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.904 <sup>a</sup>	.817	.810	3.21686

a. Predictors: (Constant), Survei Kapal

Based on the results of SPSS output between the value of R Square = 0.817, it can be concluded that 81.7% of the ship survey can explain the feasibility of the ship and the remaining 18.3% (100% - 81.7% = 18.3%) is caused by other factors outside of research, namely condition surveys, damage surveys, or with Marine surveys, and other surveys.

**Correlation Coefficient Analysis**

If the significance value of  $p > 0.05$  then Ho is accepted, it means that there is no significant positive relationship between ship survey and shipworthiness. On the other hand, if the significance value is  $p < 0.05$ , then Ho is rejected, meaning that there is a significant positive relationship between the ship survey and the ship's feasibility. From the collection of data taken successfully collected and passed the stages of testing the validity - reliability, then the next stage that must be passed is to test the research hypothesis. This test also uses the SPSS program. The results of the SPSS test of the hypothesis are as follows:

		Survei Kapal	Kelayakan Kapal
Survei Kapal	Pearson Correlation	1	.904 <sup>**</sup>
	Sig. (2-tailed)		.000
	N	30	30
Kelayakan Kapal	Pearson Correlation	.904 <sup>**</sup>	1
	Sig. (2-tailed)	.000	
	N	30	30

\*\* . Correlation is significant at the 0.01 level (2-tailed).

From the data in the table above, the correlation coefficient value is 0.904 with a significance value of p value of 0.000, because the significance value of  $p < 0.05$ , then Ha is accepted, meaning that there is a significant positive relationship between ship surveys and

shipworthiness. If we judge based on interpretation according to (Sugiono, 2015:257) in his book entitled "Educational research methods".

### Loading Factor Analysis

The loading factor is a number that shows the correlation between the score of a question item and the indicator score of the indicator construct that measures the construct. A loading factor value greater than 0.7 is said to be valid. However, according to Hair et al. (1998) for an initial examination of the loading factor matrix, approximately 0.3 is considered to have met the minimum level, and for a loading factor of approximately 0.4 is considered better, and for a loading factor greater than 0.5 is generally considered significant. In this study the limit of loading factor used is 0.7. After processing the data using SPSS Ver.23.00 the loading factor results can be shown as in the table below.

Variabel	Dimensi	Indikator	Pernyataan	Outer Loading	
Survei Kapal	SDM	Manajemen Operasional mutiara	SK1.1	0.692	
		Pengalaman	SK2.1	0.674	
			SK2.2	0.782	
		Keterampilan	SK3.1	0.786	
		Sesuai yang terencana	SK4.1	0.669	
			SK4.2	0.644	
		Evaluasi (Controlling)	SK5.1	0.641	
			SK5.2	0.613	
			SK5.3	0.737	
		Pengalaman	SK6.1	0.783	
			SK6.2	0.518	
		Jangka Waktu Survei		Annual Survey	SK7.1
	SK7.2			0.615	
Intermediate survey	SK8.1			0.625	
Doc Ring	SK9.1			0.692	
Kelayakan Kapal	Keamanan	Konstruksi bangunan kapal	KK1.1	0.802	
		Stabilitas kapal	KK2.1	0.713	
	Keselamatan	Peralatan keselamatan		KK3.1	0.600
				KK3.2	0.734
				KK3.3	0.615
				KK3.4	0.725
	Pencegahan pencemaran perairan	Pemeriksaan dan kelengkapan		KK4.1	0.589
				KK5.1	0.678
			Garis umbar	KK6.1	0.682
			Pengamanan kapal	KK7.1	0.747
			Pengawasan kapal	KK8.1	0.802
				KK8.2	0.713
				KK8.3	0.600
			Manajemen operasional	KK9.1	0.734
	KK9.2	0.615			

**The results of the analysis of the Vessel Survey variable data (X) with the dimensions of HR are as follows:**

1. The Human Resources (HR) dimension which has the highest score is found in the Experience indicator of (0.783).
2. The Human Resources (HR) dimension which has the lowest score is found in the Planned Schedule indicator of (0.644).

Meanwhile, the dimensions of the Survey Period are as follows:

1. The dimension of the Survey Period that has the highest score is found in the 1-Year Survey indicator (Annual Survey) as big as (0.706).
2. The Dimension of the Survey Period which has the lowest score is found in the 2.5 Year Survey ( Intermediate Survey ) indicator of (0.625).

**The results of the data analysis of the Shipworthiness variable (Y) with the dimensions of Security are as follows:**

1. The Security Dimension that has the highest score is found in the Construction / Ship Building indicator of (0.802).
2. The Security Dimension which has the lowest score is found in the Ship Stability indicator of (0.713).

Meanwhile, the dimensions of Safety are as follows:

1. The Safety Dimension which has the highest score is found in the Ship Manning indicator of (0.802).
2. The safety dimension that has the lowest score is found in the Water Pollution Prevention indicator of (0.589).



## Effect of Ship Survey on Shipworthiness (Case Study of PT Makara Jaya Marine Client)

The results of research that have been carried out by researchers can it was concluded that the ship survey variable was partially tested on the ship's feasibility resulting in a t-test of  $11.169 > t$  table 2.048 and a sig value of  $0.00 < 0.05$ . Based on the data above, the ship survey variable in this study has a positive and significant effect on the ship's feasibility. Based on simple linear regression analysis, the value  $(b) = 0.814$ . This means that the ship survey variable affects the ship's feasibility by 0.814 or has a positive effect, which means that if the ship's survey variable increases by 1, it affects the ship's feasibility by 0.814. After the data analysis that has been carried out in the loading factor for indicators that are high / dominate have efforts / strategies to maintain, and for low indicators have efforts / strategies to improve, namely as follows: The largest dimension in contributing to the Ship Survey variable is the Human Resources (HR) dimension, with the largest loading factor being the work experience indicator (0.783) and the lowest being the planned schedule indicator (0.644); The largest dimension in contributing to the Shipworthiness variable is the Security dimension, with the largest loading factor being the ship construction/building indicator (0.802) and the lowest being the vessel stability indicator (0.713).

To increase the Shipworthiness variable (Y), the Vessel Survey variable (X) must also be increased by maintaining the Human Resources (HR) dimension on the work experience indicator by seeking experienced human resources (HR) to be rewarded (certificates) awards, promotions, salary increases) so that they can contribute even better, as well as conduct coaching to younger auditees/surveys. Then on the indicators of the planned schedule by seeking to increase the commitment to work on the survey according to schedule. The survey schedule is made causing all related units and elements to be approved and validated. For this reason, it is necessary to improve the quality assurance system through ISO 9001:2015.

Meanwhile, the improved Shipworthiness variable (Y) is the security dimension on the construction / ship building indicators by seeking to provide good maintenance in the construction of ship frames so that they are always in a proper condition and well used when sailing. Then in terms of ship stability indicators, efforts are made in a more improved way to always calculate the ship's cargo in accordance with the gross tonnage of the ship so that the stability of the ship is not more than the gross tonnage of the ship, and the ship is in a safe condition when operated.

## CONCLUSION

Based on the results of the analysis of research testing that the author has done at PT Makara Jaya Marine on the Effect of Ship Surveys on Shipworthiness (a case study of PT Makara Jaya Marine's client), in full the author can draw a conclusion and describe it as follows: The effect of ship surveys on shipworthiness in a client case study at PT Makara Jaya Marine based on hypothesis testing that has been carried out using the t test, it is found that  $t$  count = 11.169 and after consulting with t table at a significant level of 5% and  $n = 28$  shows t table = 2,048. Because t count is in the rejection area of  $H_0$  ( $11,169 > 2,048$ ) then  $H_0$  is rejected and  $H_a$  is accepted. The existence of a low loading factor weight on the ship survey variable is found in the Human Resources (HR) dimension which has the lowest score found in the Planned Schedule indicator of (0.644), the Survey Period dimension which has the lowest score is in the 2.5 Year Survey indicator. (Intermediate Survey) of (0.625). Then the shipworthiness variable is found in the Security dimension which has the lowest score found in the Ship Stability indicator of (0.713) and the safety dimension which has the lowest score is found in the Water Pollution Prevention indicator of (0.589) these indicators must be increased more maximally. With a coefficient of determination of 81.7% (rounded up to 81%) it has a positive effect, meaning that the higher the ship survey, the higher the feasibility of a ship. While 18% is a factor that affects the Y variable from other factors not

examined by researchers. Thus, it is proven that there is a strong and positive effect between ship surveys on shipworthiness in the client case study at PT Makara Jaya Marine, which is 81%. Therefore a ship survey is an important variable to be considered carefully in paying attention to the feasibility of a ship.

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