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HASIL PENILAIAN SEJAWAT SEBANDING ATAU *PEER REVIEW*
KARYA ILMIAH : SEMINAR INTERNASIONAL

Judul karya ilmiah (paper) : STRENGTH ANALYSIS OF VESSEL SHIP TYPE PBL CONVERSION FROM BARGE
Jumlah Penulis : 2 Orang (**Budi Utomo**, Budhi Santoso)
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Sulaiman, A.T, M.T
NIP.195707261983031002
Sekolah vokasi Undip

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NIP.197008271999031002
Sekolah Vokasi Undip

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NIP 195707261983031002
Unit/Kerja : Sekolah Vokasi

Reviewer 2,

Dr.Moh. Ridwan, ST,MT
NIP 197008271999031002
Unit/Kerja : Sekolah Vokasi

Strength Analysis of Vessel Ship Type PBL Conversion From Barge

by Budi Utomo

Submission date: 24-Jan-2020 03:51PM (UTC+0700)
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Strength Analysis of Vessel Ship Type PBL Conversion From Barge

1st Budi Utomo
Naval Achitecture
Vocational Shcool of Diponegoro University
Semarang, Central Java
budiutomo_undip@yahoo.co.id

2nd Budi Santoso
Naval Achitecture
Enginnering Polytecnic of Bengkalis
Bengkalis, Riau
budhisantoso@polbeng.ac.id

Abstract*—One of the stages in evaluating ship design is the calculation of the strength of the ship's length. So we need a support tool that can speed up the calculation process. Therefore it is necessary to develop a program for calculation, as an alternative to evaluate the strength of the ship's length. Analysis of the strength of the length of the vessel to determine the strength of the length of the ship which is the result of conversion from the barge. Lengthening strength calculations using numerical methods with the help of the maxsurf study version program. Voltage price checks are carried out on three loading conditions, namely (1) empty load conditions, (2) FWT, FOT conditions , in conditions of 50% and (3) full load conditions (working conditions) . The results of this study are in the form of a calculation of the longitudinal strength of the vessel in operation. The final output of this program is in the form of a latitude and mom style curve in the longitudinal direction of the ship. The results of the calculation of the strength of the longitudinal PBL vessel results from the shear force and moment. Shear force on loadcase 2, and 3 conditions in the parallel position of the midle body of the frame frame 25 longposes 58 and 60 meters in a row. Whereas in the 1 shear force loadcase at fram 26 post length 58 meters.The maximum load case 1 moment is 7,605 × 10 ^{3} tonne meters. Loadcase 2 is 10.232 × 10 ^{3} tonne meters, while in loadcase 3 is 9,974 × 10 ^{3} tonne meters.

***Keywords*— longitudinal strength, software, shear force, momen, PBL ship**

I. Introduction

Increasing the need for transportation equipment to transport various kinds of cargo from natural resources to logistics. Sea transportation is that the ship has advantages in terms of its huge load capacity. Especially in an archipelago country like Indonesia, the way to distribute various kinds of mutants such as logistics to various islands is none other than using ships. However, as well as land and air vehicles, marine vehicles also have the possibility of experiencing damage during their use. Therefore the need for transportation equipment in the form of ships increases as the number of requests continues to grow. Increasing the need for ships can be overcome by modifying existing vessels. like the PBL vessel which is a modification of the barge. However, as a modified barge building has a disadvantage compared to a new vessel specific to PBL vessels, the shortage is the possibility of damage to the PBL ship itself due to various types of equipment above it. Therefore it is necessary to review the longitudinal strength , which in this case is affected by the distribution of the charge which is the internal pressure of the equipment PBL ship itself and the cargo on it. Especially when the ship PBL m emiliki exceeding 102.50 meters long it is necessary to check the power of longitudinal which are also present in the class rules. In this study will be discussed how to find out how much influence the internal load in the form of cargo and equipment and the load that occurs. In addition, a longitudinal strength analysis of PBL vessels which are converted from barges will also be carried out. PBL type ships are generally made using new pontoons in this case PBL ships are barges that are already unused. Looking at the case above, it is necessary to re-check the strength extending due to different loading conditions from the barges that become PBL ships. By analyzing the load that occurs due to the influence of the PBL ship load it can be known the minimum strength required. Moreover, the different burden of each ship that will do docking is also a consideration for the need to check the lengthening strength of the floating dock so that there will be no structural failure in the future. this study uses a numerical method with the help of a computer in the stress analysis experienced by the PBL vessel.

II. Method

2.1 PBL Ship

PBL ships are ships used to unload coal loads. Main dimension of PBL LPP ship 102.50 meters; breadth 19 meters; breadth max 25 meters; 6.70 meters depth. This PBL vessel is equipped with a conveyor system mounted on the left side of the ship along the ship.Next the PBL ship is also equipped with a mobile crane system located on the deck of the ship. Modeling is carried out with the help of a computerized system to obtain the PBL ship model.

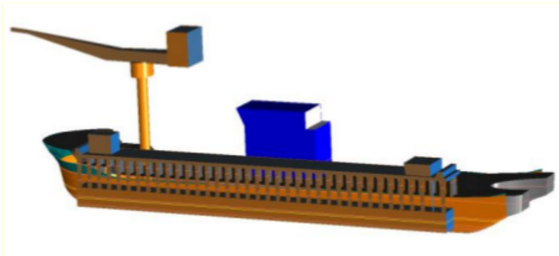

Fig. 1. View side Model PBL Ship

The models that have already been obtained are processed in the software to produce longitudinal force calculation data. After ensuring that the model meets the model, it is used to analyze various variations of loading conditions. After all loading and boundary conditions have been applied to the model, the next step is to run the modeling and analyze the results of the modeling. the voltage at working conditions is less than the permit voltage and the voltage in the condition of an empty charge is smaller than the permit voltage. Even though in the submerged condition the resulting voltage does not meet the rules of the class, but the results are acceptable because these conditions only occur for a moment in the real floating dock condition does not exceed the yield of the material used [3].

2.2 Weight Component

There are two major components of ship's weight; they are light weight and dead weight.

a. LightWeight
Light weight measures the actual weight of the ship with no fuel, passengers, vehicles, water, etc. on board. The light weight distribution can be seen on the calculation.

b. Dead Weight
Dead weight is the displacement at any loaded condition minus the light weight. It includes the crew, passengers, vehicles, fuel, water, and stores.

2.3 Weight Distribution, Loading, Shearing Force and Bending Moment

The Longitudinal distribution of weight is assessed by dividing the ship into large number of intervals. Several displacement intervals (groups) are used. The weight falling within each interval is assessed for each item or group in the schedule of weights and tabulated. Total for each interval divided by the length give mean weight per unit length. It is important that the center of gravity of the ship divided up in this way should be in the correct position. To ensure this, the centers of gravity of each individual item have been checked after it has been distributed.

2.4 Loading, Shearing Force and Bending Moment

Because the weight curve has been drawn parallel to the buoyancy curve, the difference between two, which represents the net loading p' for each interval. It comprises a series of rectangular blocks. The loading curve is integrated to obtain the distribution of shearing force along the length of the ship. The integration is a simple cumulative addition starting from one end and the shearing force at the finishing end should, of course, be zero; in practice, due to the small inaccuracies of the preceding steps, it will probably have small value. This is usually corrected by canting the base line, i.e. applying a correction at each section in proportion to its distance from the starting point. The most forcw transverse is at first integral from load f(x)[1].

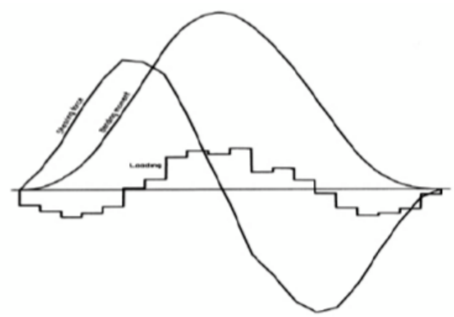

Fig.2. Typical loading, shearing force and bending moment curves

The curve of shering force obtained is a series of straight lines. This curve is now integrated in accordance with relationship to obtain the distribution of bending moment M. Intergration is again a cumulative addtion of the areas of each trapezium and the inevitable final error, which should be small, is distributed in same way as is the shearing force error. if the error is laege, the calculation must be repeated using smaller intervals for the weight distribution.

2.5 Longitudinal Strength Calculation

Longitudinal strength is a calculation of the strength of a ship seen in a long way to support the load and load of the ship. When the ship sails in calm or bumpy water conditions it will experience uneven loading. The calculation of Longitudinal strength is one classification requirement. The entry category for ships that have a length of more than 65 m ether. Dimension ship and scantling (plate size and profile) will affect the calculation results. Longitudinal strength will calculate the moment inertia of scantling. This is done to get the amount of stress and moment experienced by the ship due to load and wave loads. In this condition it is considered that the curvature of the ship's gravity distribution and the curvature of the compressive force distribution upwards as long as the ship can meet the second equilibrium requirement, namely the center of gravity and the center point of the upward force is located on a vertical line (one work line).

Three boundary conditions are divided into two pieces placed on the back of the ship and one piece is placed on the front of the ship. The first point placed behind and on starboard with the degree of freedom locked (fixed) is the direction of x, y, and z to eliminate the three translations. Then the second point is placed parallel to the first point on the portside with a different x coordinate but the y and z coordinates remain the same. At this second point the degrees of freedom that are locked (fixed) are the direction of y and z to eliminate the rotation of z and y but there is still a rotation of the x axis. The last is the third point that is placed on the front of the ship at the centerline and the degree of freedom that is locked (fixed) is the direction y to eliminate the last rotation which is the rotation of the x axis [2].

Calculation of latitude and moment forces aims to calculate the maximum force and curvature moment that occurs on the ship. Latitude or shear force is the force generated by loading. Loading is a force that weighs on the structure of the ship's construction in this case the difference between ship weight distribution with force distribution press upwards . Moments are forces acting on objects that make the object rotate because of two forces or more. In other words the moment is the amount of force that works on objects at a certain distance [4] .

Maximum Permissible Shear Force and Still Water Bending Moment. The values of maximum permissible Shear Force and Still Water Bending Moments for various frames are taken as follows:

TABLE 1. EQUILIBRIUM PBL SHIP EACH LOADCASE

Data	LOADCASE 1	LOADCASE 2	LOADCASE 3
Draft Amidships m	2.248	2.563	2.642
Displacement t	3903	4530	4692
Heel deg	0.9	-0.3	-0.3
Draft at FP m	2.719	2.701	2.654
Draft at AP m	1.777	2.424	2.631
Draft at LCF m	2.255	2.564	2.642
Trim (+ve by stern) m	-0.942	-0.276	-0.023
WL Length m	92.568	93.51	93.859
Beam max extents on WL m	26.643	26.64	26.64
Wetted Area m^2	2319.442	2392.233	2409.8
Waterpl. Area m^2	1994.572	2006.84	2007.712
Prismatic coeff. (Cp)	0.694	0.768	0.786
Block coeff. (Cb)	0.569	0.658	0.684
Max Sect. area coeff. (Cm)	0.837	0.869	0.871
Waterpl. area coeff. (Cwp)	0.809	0.806	0.803
LCB from zero pt. (+ve fwd) m	55.018	52.703	51.952
LCF from zero pt. (+ve fwd) m	51.896	51.605	51.577
KB m	1.262	1.406	1.446
KG fluid m	6.271	6.009	5.76
BMt m	29.959	25.923	25.04
BML m	310.609	273.662	264.644
GMt corrected m	24.948	21.319	20.726
GML m	305.599	269.058	260.33
KMt m	31.215	27.329	26.486
KML m	311.821	275.063	266.085
Immersion (TPc) tonne/cm	20.444	20.57	20.579
MTc tonne.m	126.923	129.706	129.989
RM at 1deg = GMt.Disp.sin(1) tonne.m	1699.365	1685.59	1697.301
Max deck inclination deg	1.0324	0.359	0.3358
Trim angle (+ve by stern) deg	-0.5742	-0.1686	-0.0141

III. RESULTS AND DISCUSSION

In this study there were three loading conditions which were analyzed using numerical methods to obtain the main response in the form of longitudinal deformation and stress. The following are three variations of loading conditions used:

1) Load Case 1: is the loading condition where PBL ships being in an empty condition that is floating without any charge on it. The workload is only in the form of the weight of the PBL ship itself and buoyancy that works on PBL's hull at 102.50 m. Is the safest loading or in other words not bad.

2) Load Case 2: is a loading condition where PBL ships are in immersing condition, ie all PBL hulls are submerged up to the deck and the only ones left are safety decks (working decks) of non-immersed wing tanks. The work load is the weight of the vessel PBL itself, the weight of tanks and buoyancy which works pa da hull on a full 6.7 0 m. Is the worst burden.

3) Load Case 3:

is a loading condition where the PBL vessel is in working condition that is floating in the presence of a load above it. The working load is the weight of the PBL vessel itself, the weight of the tanks, and the buoyancy that works on PBL's hull on 6.70 m laden .Is a load requested by the class society to be calculated with a certain maximum voltage limit.

2.5 Load Case 1

Based on a calculation analysis longitudinal strenght 1 loadcase result right moment 7. 605 ton.m on longitudinal posistion 60 meters.

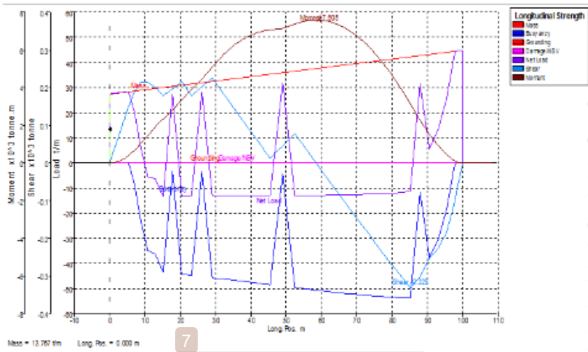

Fig. 3. Longitudinal Strength Load case 1

2.6 Load Case2

Based on the calculation analysis longitudinal strenght on 2 loadcase result right moment 10,323 ton.meters on longitudinal position 60 meter

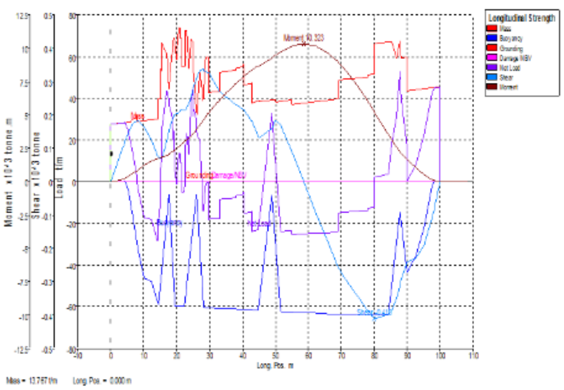

Fig. 4 Longitudinal Strength Load case 2

2.7 Load Case3

Based on the analysis of longitudinal calculation of the strenght on the 3 loadcase moment produced 9,97 tonmeters in the 60 meter longitudinal position.

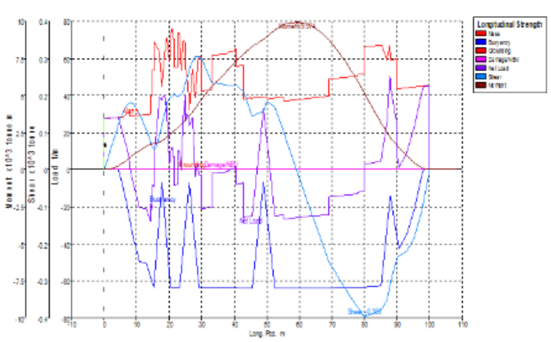

Fig. 5. Longitudinal Strength Load case 3

IV. CONCLUSION

Based on PBL ship loading modeling that has been carried out, it can be concluded as follows:

The maximum voltage experienced by PBL ships in all three loading conditions on loadcase 1 evenly distributed throughout the ship, loadcase 2 and 3 occur in the stern area of the ship. Strength extends from PBL ships can be seen in the results of shear forces and moments . Shear force on loadcase 2, and 3 conditions in the parallel position of the midle body of the frame frame 25 longposes 58 and 60 meters in a row. Whereas in the 1 shear force loadcase at fram 26 post length 58 meters. The maximum load case 1 moment is $7,605 \times 10^3$ tonne meters. Loadcase 2 is 10.232×10^3 tonne meter , while at loadcase 3 is 9.974×10^3 tonne meter .

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Authors

Name	budi utomo
URL	http://www.vokasi.undip.ac.id
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Principal contact for editorial correspondence.

Name	Budi Santoso
Affiliation	D3 Teknik Perkapalan Politeknik Negri Bengkalis Riau
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Title and Abstract

Title Strength Analysis of Vessel Ship Type PBL Conversion From Barge

Abstract One of the stages in evaluating ship design is the calculation of the strength of the ship's length. A necessary tool is needed to speed up the calculation process. Therefore, program development is needed for calculation, as an alternative to evaluating the strength of the ship's length. Analyze the strength of the ship's length to determine the strength of the ship's length which is the result of the conversion from the barge. The calculation of force extends using numerical methods with the help of maxsurf program of study version. Voltage price checking is done on three loading conditions ie (1) empty load condition, (2) FWT condition, FOT, in 50% and (3) condition of full charge work). The result of this research is a calculation of longitudinal force of ship in its operation. The final output of this program is the curve of latitude and the moment in the longitudinal direction of the ship.

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One of the stages in evaluating ship design is the calculation of the strength of the ship's length. So we need a support tool that can speed up the calculation process. Therefore it is necessary to develop a program for calculation, as an alternative to evaluate the strength of the ship's length. Analysis of the strength of the length of the vessel to determine the strength of the length of the ship which is the result of conversion from the barge. Lengthening strength calculations using numerical methods with the help of the maxsurf study version ...

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Strength Analysis of Vessel Ship Type PBL Conversion From Barge

Authors
Budi Utomo, Budi Santoso

Corresponding Author
Budi Utomo

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Legal Restoration Eradication of Illegal Fishing Towards Sovereignty at Sea

Derita Prapti Rahayu
Faculty of Law, University of Bangka Belitung, Indonesia
itha82017@gmail.com

Esmi Warassih
Faculty of Law, Diponegoro University, Semarang, Indoensia

Yokotani
Faculty of Law, University of Bangka Belitung, Indonesia

Sulaiman
Faculty of Law, Syiah Kuala University, Aceh, Indonesia

M. Adli Abdullah
Faculty of Law, University of Bangka Belitung, Indonesia

Abstract –**There is one courage from the Minister of Marine Affairs and Fisheries from the beginning of the inauguration, ie sinking a boat that catches fish illegally. Until now, the Indonesian Ministry of Marine Affairs and Fisheries has drowned more than 350 ships of various sizes committing illegal fishing crimes in Indonesian sovereign territory. Using the socio-legal approach, this paper wishes to offer legal refinement in order to give a firm legality of illegal fishing eradication through the ship's sinking.Illegal fishing crime in Indonesian waters, believed to have caused losses for this country is estimated at more 40 billion rupias a year. This condition is even believed to be an obstacle in accelerating Indonesia as a prosperous country. It is for this reason that the sinking of the ship is seen as the representative of the face of courage in defending sovereignty. Drowning of ships is considered strategic in order to combat illegal fishing, especially by raising the fear of outside fishermen who stole fish in Indonesian waters.For some, the sinking of vessels could incur substantial losses, especially the opportunities of countries that should be able to utilize ships through foreclosures for the country. Some people believe that the foreclosure could be used by black entrepreneurs who cooperate with unscrupulous law**

in global fisheries. Fishing access affects social and environmental impacts. [1]

In Indonesia, fisheries problems are very serious.In the last 40 years, many fish populations in Indonesian waters have been depleted.One of the causes is the theft of fish in Indonesian waters.Security issues in enforcing fisheries regulations are one of the things that are still constrained.One way to overcome the Indonesian government's limited ability to enforce fisheries regulations and control the movement of fishing vessels to other countries' waters is to establish a regional regulation regime that builds and expands fisheries development. [1]

In this regard, decentralization is considered as an alternative to make fisheries management better, because decentralization appears as a means to improve efficiency and fairness in development activities and service delivery.The evolution of decentralization of fisheries management policies in Indonesia shows that decentralization was gradually developed from deconcentration and delegation to the form of devolution.

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Action against and Punishment for Illegal Fishing Inflicting Financial Losses on The State

Ahmad Sofian
Business Law Program, Law Department, Faculty of Humanities, Bina Nusantara University, Indonesia
Email: asofian@binus.edu

Abstract---**Illegal fishing has been rampant in the Indonesian Exclusive Economic Zone (EEZ) since these last five years. This has resulted in the detriment to the finances of the State and breach of the sovereignty of the State. Per the Ministry of Marine Affairs and Fisheries Republic Indonesia suffers financial losses of USD 20 billion or IDR 240 trillion annually from illegal fishing. Therefore, the Indonesian Government has established a Task Force for Illegal Unreported and Unregulated (IUU) Fishing. One of its tasks is to sink foreign ships stealing fishes in the Indonesian waters without any judicial process. However, the action is considered to breach the international maritime law. especially Paragraph (4) of Article 73 of UNCLOS 1982. The research aims to explore whether the action is effective to fight illegal fishing and return the detriment to the finances of the State. A normative research method was applied in the research and interviews with economic law experts in marine and fishery sectors were conducted. The research recommends the need to harmonize laws and regulations related to illegal fishing to the United Nations Convention on the Law of the Sea. Illegal fishermen should be liable for criminal liability to pay compensation to immediately return the detriment to the finances of the State.**

Keywords---Illegal Fishing, Suppress and Punish, Marine

I. INTRODUCTION

The rampant illegal fishing in Indonesia since these last

Indonesia is rich in marine resources that can be used to increse its economy [1]. Illegal fishing is rampant in the Indonesian waters, especially in Natuna, South Arafura, North Bitung and West Papua Seas as well as seas of the Indian Ocean [3].

There are some illegal fishing cases which have been taken to court. One of them is the case of Zhu Nian Le, a Chinese ship captain, in 2015. He was the captain of M.V. Hai Fa Ship and was prosecuted under Article 100 *juncto*Paragraph (2) of Article 7 of Law Number 31 Year 2004 which was amended through Law Number 45 Year 2009 on Fishery [4]. In their decision, Ambon Fishery Court ordered the defendant to pay a fine of 200 million rupiahs. However, the punishment is considered too light because illegal fishing of 15 tons of sharks (*carcharhiniuslongimanus*and*sphymaspp*) not only has destroyed Indonesia's marine resources but also breachedthesouvereignty of the State [5].

The sinking and burning of dozens of foreign ships by the Ministry of Marine Affairs and Fisheries without anyjudicial process are the authority of the State. This is in line with Paragraph (4) of Article 69 of Law Number 45 Year 2009 on the Amendment of Law Number 31 Year 2004 on Fishery stipulating that in the performance of the