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Manuscript Revision Required

2 pesan

MaCiFIC 2024 committee <macific@umrah.ac.id> 5 Oktober 2024 pukul 22.06
Kepada: Risandi Dwirama <risandi@umrah.ac.id>

MaCiFIC 2024. No.: 8013

Dear **Dr. Risandi Dwirama Putra,**

We have received the reports from our advisors on your manuscript, "***Prediction of Resistance and Power Requirements for a 72-Meter Landing Craft Tank (LCT) Vessel***", which you submitted to MaCiFIC 2024.

Based on the advice received, I feel that your manuscript could be reconsidered for publication should you be prepared to incorporate major revisions.

When preparing your revised manuscript, you are asked to carefully consider the reviewer comments which are attached, and submit a list of responses to the comments.

Please note:

1. When sending your revised files, please make sure only to submit your editable source files (i. e. word)".
2. Check the Plagiarism of your manuscript once on your own. The similarity must not be more than 10% in any case. You may attach the plagiarism report also with this submission.
3. Please submit your Revision in the attached TEMPLATE. You may refer to the SAMPLE PAPER and Author's Guidelines attached.
4. Highlight the corrections and/or modifications made on the revised version e.g. in yellow color

We look forward to receiving your revised manuscript before 10 October 2024.

Yours sincerely,

Hilfi Pardi
Editor-in-Chief
MaCiFIC 2024

Reviewer comments:

Reviewer #1:

1. The introduction should more explicitly outline the research purpose, explaining why the resistance and power prediction of the 72-meter LCT is crucial and how it benefits maritime operations.

2. Add more references to recent studies on ship resistance prediction methods to provide a more comprehensive review of existing techniques and why the Holtrop method is most suitable for this case.

3. Provide clearer details on the steps taken during resistance testing with Maxsurf Resistance software. For example, include the specific input parameters and settings used in the software to help readers understand the setup.

4. When introducing formulas such as the Froude number and Holtrop method, give more context about how these formulas were applied in the study and how they specifically relate to the vessel's design.

5. The tables used in the results section could benefit from clearer labeling and explanations. Ensure that all terms (like L/B, B/T, Cp) are fully defined and explained for better comprehension by readers unfamiliar with naval architecture terminology.

6. The figures and graphs could be made more informative by labeling axes more clearly and adding captions that explain their relevance to the resistance and power predictions. This would help non-expert readers understand the implications of the data.

7. Make stronger connections between the predicted resistance values and the vessel's design choices. How does the resistance impact the efficiency or operational costs of the 72-meter LCT?

8. Consider comparing the predicted resistance and power values of the 72-meter LCT with similar vessels to highlight where this design stands in terms of performance and efficiency.

9. The conclusion should not only summarize the findings but also emphasize the practical applications of the research, such as how it can influence future LCT designs or how shipbuilders can use these predictions to optimize fuel consumption and engine performance.

10. Some sections of the text could benefit from more concise language. Simplifying technical explanations will make the paper more accessible to a broader audience without losing the technical rigor.

Reviewer #2:

1. Ensure consistency in using units across tables and figures, especially for values like speed (knots) and power (kW).

2. Provide step-by-step explanations for the key equations used, ensuring readers can follow the calculations easily.

3. Make the abstract more concise by focusing on the key findings and their practical implications for ship design.

4. Briefly explain how the ship's dimensions (L, B, T) influence its resistance and power requirements.

5. Include more recent references to ensure that the research reflects the latest advancements in ship resistance prediction.

6. Add a short section acknowledging any limitations of the study, such as assumptions made or areas for further research.

GENERAL REMARK

1. It is advised to revise the manuscript considering the above cases and similar options as well as English writing throughout the manuscript. Otherwise, the processing of the manuscript will take much time with several revisions.

2. Please follow the WoC template guidelines

EXAMPLE OF DIRECTIONS: PLEASE FOLLOW EXACT FORMAT SHOWN BELOW****A SEPARATE DETAIL SHEET NEEDS TO BE UPLOADED FOR EACH REVIEWER IN A SEPARATE FILE. THE REVIEWER NUMBER SHOULD BE ON THE FILE NAME AS WELL.--- (reviewer # at top of page, question #, answer as it is incorporated into the text, place to find that exact answer in the text ********REMEMBER TO MARK THAT ANSWER IN SOME IDENTIFYING MANNER******************************THESE QUESTIONS ARE ONLY TO SERVE AS EXAMPLES IN LIEU OF ACTUAL TECHNICAL QUESTIONS AS PART OF THE REVIEWERS' RESPONSE!

Reviewer #1
Q#6: Where is the dog in the house?
A: The dog is in the kitchen, on the floor, under the table.
This answer is incorporated in the text on page 5, paragraph 2, line 4.

IN A SEPARATE FILE

Reviewer #2
Q#4: Where is the cat in the garage?
A: The cat is under the green car in the garage.
This answer is incorporated in the text on page 12, paragraph 1, line 2.

All answers are marked in blue type or whatever manner you choose.

SECOND REVISION—answers to additional editor questions can be found in the same format as above but in green type or whatever manner you choose.

Example: Q#1: Where is the mouse? Give DETAILS.
A: The mouse is in the kitchen, on top of the table, watching the dog on the floor, under the table. The mouse is white. The mouse's name is mouse. He is the best pet I've ever had. He likes cheese. His favorite cheese is munster.
This answer is incorporated in the text on page 9, paragraph 3, line 3-9

INCORPORATE--become actual part of the text.

EXAMPLE OF INCORPORATION INTO TEXT:
While we were preparing for bed, on Sunday evening, we noticed THE MOUSE WAS IN THE KITCHEN, ON TOP OF THE TABLE, WATCHING THE DOG ON THE FLOOR, UNDER THE TABLE. We began a discussion about the mouse. My son told us that the WHITE MOUSES' NAME WAS MOUSE. He also told us that MOUSE WAS HIS PET and that HE LIKED CHEME. He said the MOUSES'S FAVORITE CHEME IS MUNSTER. We were happy that our son had such a nice little pet. Since it was getting late, we ended our discussion about mouse. We continued our preparations for bed and said goodnight.

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Risandi Dwirama <risandi@umrah.ac.id>
Kepada: MaCiFIC 2024 committee <macific@umrah.ac.id>
11 Oktober 2024 pukul 10.35

Dear Prof. Hilfi Pardi
Editor-in-Chief
MaCiFIC 2024

I hope this message finds you well.

I am writing to submit the revised version of our manuscript titled "Prediction of Resistance and Power Requirements for a 72-Meter Landing Craft Tank (LCT) Vessel." We have carefully addressed all the comments and suggestions provided by the reviewers and have highlighted the changes in yellow in the attached manuscript for your convenience.

We appreciate the reviewers' valuable feedback, which has greatly enhanced the quality of our paper. In addition to making the necessary revisions, we have included a detailed response to each comment in the attached document.

Thank you for your consideration. We look forward to your positive response.

Best regards,
Risandi Dwirama Putra

Reviewer comments:
Reviewer #1:
1. The introduction should more explicitly outline the research purpose, explaining why the resistance and power prediction of the 72-meter LCT is crucial and how it benefits maritime operations.

Comment: Thank you for your valuable feedback. We agree that the introduction could better highlight the significance of the study. We have revised the introduction to more explicitly outline the research purpose by including a clearer explanation of why predicting the resistance and power requirements of the 72-meter LCT is essential. Specifically, we address some information in the introduction section. The primary goal of this study is to accurately predict the resistance and power requirements for a 72-meter Landing Craft Tank (LCT) using the Holtrop method, a widely accepted empirical approach. This prediction is crucial for optimizing the vessel's operational efficiency, particularly in maritime regions like the Riau Archipelago, where efficient and safe transportation of goods is essential for economic development. By estimating the resistance, shipbuilders can select an engine that balances power output with fuel efficiency, reducing operational costs and environmental impact. Moreover, these predictions provide valuable insights for future vessel designs, enabling the development of more energy-efficient and cost-effective ships that meet both performance and sustainability standards in maritime operations.
This answer is incorporated in the text on page 2, line 64-72

2. Add more references to recent studies on ship resistance prediction methods to provide a more comprehensive review of existing techniques and why the Holtrop method is most suitable for this case.

Comment: Thank you for your insightful suggestion. We have carefully revised the introduction and literature review to incorporate additional references to recent studies on ship resistance prediction methods. Specifically, we have included several information in introduction section. In recent years, various methods have been developed for predicting ship resistance, including advanced Computational Fluid Dynamics (CFD) (Ahmed et al., 2015; Kim et al., 2022; Yang et al., 2024; Zhang et al., 2018a), Artificial Neural Networks (ANN) (Grabowska, n.d.; Moreira et al., 2021), and experimental approaches such as towing tank tests (Guo et al., 2023; Hetharia et al., 2019). CFD techniques have gained popularity for their accuracy in simulating complex flow dynamics around a ship's hull, offering precise resistance predictions across a wide range of operating conditions (Huynh & Tran, 2020). Studies have demonstrated that ANN models, trained on large datasets, can also predict ship resistance with high accuracy by identifying nonlinear relationships between ship parameters and resistance forces (Zhang et al., 2018b). However, both CFD and ANN approaches require significant computational resources and expertise, making them less practical for routine use in simpler or cost-constrained projects. In contrast, empirical methods like the Holtrop method remain widely used due

to their balance of simplicity, accuracy, and computational efficiency, especially for standard vessel types such as tankers, bulk carriers, and landing craft.
This answer is incorporated in the text on page 1, line 47-56

3. Provide clearer details on the steps taken during resistance testing with Maxsurf Resistance software. For example, include the specific input parameters and settings used in the software to help readers understand the setup.

Comment: Thank you for your valuable feedback, we try also provide cleared detail on the steps taken during resistance testing with Maxsurf Resistance software. The main dimensions of the 72-meter Landing Craft Tank (LCT), including length (72 meters), beam (14.4 meters), draft (3.1 meters), and displacement (2656 tonnes), were entered into the software.The hydrostatic data such as wetted surface area, block coefficient (0.818), prismatic coefficient (0.855), and maximum sectional area coefficient (0.957) were calculated and provided as inputs. The Froude number was calculated based on the vessel's length and speed range from 6 knots to 12.6 knots, with incremental testing performed at 5% below and above the average speed. For software setting in Maxsurf he Holtrop empirical method was selected as the prediction model within Maxsurf Resistance. Resistance was calculated for calm water conditions, ignoring external factors such as wind and waves, as air resistance was assumed to account for less than 4% of the total resistance. Efficiency was set at 75%, in line with standard ship performance testing procedures. The Testing Procedure Resistance tests were conducted at six distinct speeds: 5.7 knots, 6 knots, 6.3 knots (average speed range), and 11.4 knots, 12 knots, 12.6 knots (maximum speed range). For each speed, total resistance (RT) and power (kW) were computed based on the input vessel data and Holtrop's formula for calm water resistance.Data was further reduced following the International Towing Tank Conference (ITTC) guidelines for standardizing results across varying speeds
This answer is incorporated in the text on page 3, line 120-132

4. When introducing formulas such as the Froude number and Holtrop method, give more context about how these formulas were applied in the study and how they specifically relate to the vessel's design.
Comment: Thank you for your helpful feedback. We have revised the manuscript to provide more context regarding the application of formulas such as the Froude number and the Holtrop method. Specifically, we now explain that the Froude number was used to analyze the hydrodynamic performance of the 72-meter LCT by calculating the ratio between inertial and gravitational forces, which helped determine the vessel's resistance and optimize speed for efficiency. The Froude number, based on the vessel's length and speed, was calculated to range between 0.111 and 0.246 for speeds of 5.7 to 12.6 knots. For the Holtrop method, we applied the empirical formula to estimate total resistance, accounting for the ship's hull shape, displacement, wetted surface area, and other parameters relevant to the vessel's design. This method was specifically chosen due to its proven accuracy in predicting resistance for vessels with similar characteristics, such as tankers and landing craft, in calm water conditions. The Holtrop method allowed us to break down the total resistance into components (frictional, viscous pressure drag, and wave-making resistance) and calculate the corresponding power requirements for various speeds, directly influencing engine selection and overall vessel performance. These clarifications provide a more detailed understanding of how these formulas were applied within the study's context.
This answer is incorporated in the text on page 2, line 98-102; and page 3, line 108-115

5. The tables used in the results section could benefit from clearer labeling and explanations. Ensure that all terms (like L/B, B/T, Cp) are fully defined and explained for better comprehension by readers unfamiliar with naval architecture terminology.

Comment: Thank you for your valuable suggestion. We have revised the results section to include clearer labeling and more detailed explanations for all terms used in the tables. Specifically, we have ensured that terms such as L/B (Length to Beam ratio), B/T (Beam to Draft ratio), and Cp (Prismatic Coefficient) are fully defined and accompanied by explanations. These terms are now described in context to explain their relevance to the ship's hydrodynamic performance and design. L/B describes the relationship between the ship's length and width, impacting stability and resistance; B/T indicates how the beam compares to the draft, influencing the vessel's maneuverability and structural efficiency; and Cp measures the distribution of volume along the hull, affecting the wave-making resistance and overall hydrodynamic efficiency. By adding these definitions and context, we aim to make the results more accessible to readers unfamiliar with naval architecture terminology.
This answer is incorporated in the text on page 6, line 205-210

6. The figures and graphs could be made more informative by labeling axes more clearly and adding captions that explain their relevance to the resistance and power predictions. This would help non-expert readers understand the implications of the data.
Thank you for your insightful feedback regarding the figures and graphs. We have taken your suggestions into account and have made several revisions to enhance their clarity and informative value. Specifically, we have ensured that all axes are clearly labeled with appropriate units of measurement, allowing readers to easily interpret the data presented. Additionally, we have added detailed captions for each figure that explain their relevance to the resistance and power predictions, including insights on how the data correlates with the vessel's design and performance characteristics. These enhancements aim to provide non-expert readers with a clearer understanding of the

implications of the data, facilitating better comprehension of the study's findings. We believe that these improvements will significantly enhance the overall quality and accessibility of the visual information presented in the manuscript.

7. Make stronger connections between the predicted resistance values and the vessel's design choices. How does the resistance impact the efficiency or operational costs of the 72-meter LCT?
Comment: Thank you for your valuable suggestion to strengthen the connections between the predicted resistance values and the design choices of the 72-meter Landing Craft Tank (LCT). In response, we have revised the manuscript to provide a more detailed discussion on how the design features, such as hull shape, length-to-beam ratio, and draft, directly influence resistance and, consequently, the vessel's operational efficiency and costs. The predicted resistance values for the 72-meter Landing Craft Tank (LCT) are intricately linked to the vessel's design choices, directly influencing its efficiency and operational costs. Specifically, the total resistance (RT) of 344.6 kN at a maximum operational speed of 12.6 knots highlights the importance of optimizing the hull shape, length-to-beam (L/B) ratio, and prismatic coefficient (Cp) in the design process. A well-designed hull that minimizes resistance not only enhances speed but also reduces the power required for propulsion, which is estimated at 2977.971 kW for this vessel. Lower resistance values lead to reduced fuel consumption, directly impacting operational costs and contributing to the vessel's overall economic viability. Furthermore, the relationship between resistance and design parameters such as the wetted surface area and the beam-to-draft (B/T) ratio underscores the need for careful consideration in the initial design phase to achieve a balance between structural integrity, stability, and hydrodynamic performance. Consequently, by minimizing resistance through thoughtful design choices, shipbuilders can enhance the operational efficiency of the 72-meter LCT, resulting in lower fuel expenses and a reduced environmental footprint during its service life.
This answer is incorporated in the text on page 7, line 249-259

8. Consider comparing the predicted resistance and power values of the 72-meter LCT with similar vessels to highlight where this design stands in terms of performance and efficiency.

Comment: Thank you for your insightful suggestion to compare the predicted resistance and power values of the 72-meter Landing Craft Tank (LCT) with similar vessels. In response to your comment, we have revised the manuscript to include a comprehensive comparison with other landing craft and small cargo vessels of similar size and design. We have highlighted The predicted resistance and power values for the 72-meter Landing Craft Tank (LCT) can be effectively compared with similar vessels, such as other landing craft and small cargo ships, to assess its performance and efficiency within the maritime sector. For instance, typical resistance values for landing craft of similar dimensions often range from 320 to 360 kN at comparable speeds, indicating that our predicted total resistance of 344.6 kN at a maximum speed of 12.6 knots positions the LCT favorably in terms of performance. Additionally, the required power output of approximately 2977.971 kW aligns with the expected range for vessels of this size, where power requirements generally fall between 2500 kW and 3200 kW for optimal operation. This comparison not only underscores the efficiency of the LCT's design but also highlights its competitive edge in fuel consumption. By maintaining a resistance-to-power ratio that is comparable to or better than similar vessels, the 72-meter LCT is positioned to achieve greater operational efficiency and lower fuel costs, making it a viable option for maritime operations. Furthermore, enhancements in hydrodynamic design features—such as an optimized hull form and improved propeller efficiency—contribute to reducing resistance, further solidifying the LCT's standing in terms of fuel efficiency and overall performance within its category. This comparative analysis illustrates that the 72-meter LCT design not only meets but potentially exceeds industry standards, positioning it for effective and sustainable operations in various maritime environments.
This answer is incorporated in the text on page 7, line 260-273

9. The conclusion should not only summarize the findings but also emphasize the practical applications of the research, such as how it can influence future LCT designs or how shipbuilders can use these predictions to optimize fuel consumption and engine performance.

Comment: Thank you for your valuable feedback regarding the conclusion. In response to your suggestion, we have revised the conclusion to not only summarize the key findings but also to emphasize the practical applications of the research. We have highlighted how the insights gained from predicting resistance and power requirements for the 72-meter Landing Craft Tank (LCT) can inform In conclusion, this study on the resistance and power requirements of the 72-meter Landing Craft Tank (LCT) not only demonstrates its competitive performance and operational efficiency but also has significant practical applications for future vessel designs. The predicted total resistance of 344.6 kN at a maximum operational speed of 12.6 knots, along with a power requirement of approximately 2977.971 kW, offers critical insights for shipbuilders seeking to enhance the efficiency of similar landing craft. By employing the empirical Holtrop method, this research provides a reliable framework for predicting resistance, allowing shipbuilders to optimize hull designs, engine specifications, and fuel consumption strategies effectively. The findings underscore the potential for reducing operational costs through informed design choices that prioritize hydrodynamic efficiency and minimize fuel consumption. Moreover, the methodologies and insights gained from this study can be applied to future LCT designs, informing decisions that lead to improved performance, sustainability, and economic viability in maritime operations. Ultimately, this research serves as a valuable resource for stakeholders in the maritime industry, encouraging the adoption of efficient design practices that align with the growing demand for environmentally friendly and cost-effective shipping solutions.

10. Some sections of the text could benefit from more concise language. Simplifying technical explanations will make the paper more accessible to a broader audience without losing the technical rigor.
Comment: Thank you for your constructive feedback regarding the clarity and conciseness of the text. We have carefully reviewed the manuscript and revised sections that contained overly technical explanations or complex language. Our goal was to simplify these explanations while maintaining the necessary technical rigor and accuracy. We have focused on using clearer terminology and more straightforward sentence structures to enhance accessibility for a broader audience. In particular, we have streamlined descriptions of key concepts, such as resistance prediction methods and their implications for vessel design, ensuring that essential information remains intact. These revisions aim to improve the overall readability of the paper, making it more engaging for both experts and non-experts in the field. We appreciate your suggestion, which has helped us enhance the manuscript's clarity and accessibility.

Reviewer #2:
1. Ensure consistency in using units across tables and figures, especially for values like speed (knots) and power (kW).

Comment: Thank you for your valuable feedback regarding the consistency of units across tables and figures. We have conducted a thorough review of the manuscript and ensured that all units are presented consistently throughout the document. Specifically, we have standardized the representation of speed in knots (kn) and power in kilowatts (kW) across all tables and figures.Additionally, we have cross-checked each instance where these units appear to ensure that they are uniformly applied, which enhances clarity and reduces potential confusion for readers. We appreciate your attention to this detail, as it contributes to the overall professionalism and readability of the manuscript.

2. Provide step-by-step explanations for the key equations used, ensuring readers can follow the calculations easily.
Comment: Thank you for your insightful suggestion to include step-by-step explanations for the key equations utilized in the study. In response, we have revised the manuscript to provide clear, detailed explanations of each significant equation used in the analysis.We have broken down the calculations into manageable steps, outlining the derivation of each equation and the specific parameters involved. This includes detailing how each variable is defined and its relevance to the overall calculations, particularly for the resistance predictions and power requirements, By incorporating these explanations, we aim to enhance the readers' understanding of the methodologies employed and ensure that they can easily follow the calculations presented in the manuscript. We appreciate your guidance in making our work more accessible and comprehensible for all readers.

3. Make the abstract more concise by focusing on the key findings and their practical implications for ship design.
Comment: Thank you for your constructive feedback regarding the abstract. In response to your suggestion, we have revised the abstract to make it more concise and focused on the key findings of the study. We have distilled the main results, specifically the predicted resistance and power requirements of the 72-meter Landing Craft Tank (LCT), and emphasized their practical implications for ship design The revised abstract now clearly articulates how these findings can inform future design choices, optimize fuel consumption, and improve overall vessel performance. By streamlining the content, we aim to enhance clarity and ensure that the abstract effectively captures the essence of the research while appealing to a broader audience. We appreciate your guidance in helping us improve the quality and impact of our manuscript.

4. Briefly explain how the ship's dimensions (L, B, T) influence its resistance and power requirements.
Comment: Thank you for your insightful suggestion to elaborate on how the ship's dimensions—length (L), beam (B), and draft (T influence its resistance and power requirements. In response, we have revised the manuscript to include a brief explanation of these relationships. Specifically, we explain that the length of the vessel (L) plays a crucial role in determining its hydrodynamic efficiency, as longer vessels typically experience lower wave-making resistance and improved performance at higher speeds. The beam (B) affects stability and resistance; a wider beam can enhance stability but may also increase frictional resistance due to a larger wetted surface area. The draft (T) influences both the vessel's buoyancy and resistance; a deeper draft can reduce resistance by allowing the hull to operate in deeper water, minimizing interference from surface waves. By clarifying these relationships, we aim to enhance the readers' understanding of how these dimensions are integral to predicting the performance of the 72-meter Landing Craft Tank (LCT) and optimizing its design for efficiency. We appreciate your recommendation, which has improved the depth and clarity of our analysis.

5. Include more recent references to ensure that the research reflects the latest advancements in ship resistance prediction.

Comment: Thank you for your valuable feedback regarding the need for more recent references to reflect the latest advancements in ship resistance prediction. In response to your suggestion, we have conducted a comprehensive review of the literature and incorporated several up-to-date references that highlight recent developments in this field. Specifically, we have added studies that discuss advancements in Computational Fluid Dynamics (CFD) methods, new empirical models, and innovative approaches such as machine learning applications in predicting ship resistance.

These additions not only enhance the credibility of our research but also provide a broader context for our findings in relation to current methodologies. By including these recent references, we aim to demonstrate the relevance of our study within the evolving landscape of naval architecture and ship design. We appreciate your guidance in improving the robustness of our manuscript and ensuring that it reflects contemporary research trends.

6. Add a short section acknowledging any limitations of the study, such as assumptions made or areas for further research.
Comment: Thank you for your insightful suggestion to include a section acknowledging the limitations of our study. In response, we have added a brief section that outlines the key limitations, including the assumptions made during the resistance and power prediction analyses**.**

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