

THE EFFECT OF VARYING PRISMATIC
COEFFICIENT (CP) AND DISPLACEMENT
VOLUME ON HULL RESISTANCE OF
FISHING VESSEL

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THE EFFECT OF VARYING PRISMATIC COEFFICIENT (C_p) AND DISPLACEMENT
VOLUME ON HULL RESISTANCE OF FISHING VESSEL

By

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DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled: **The Effect of Varying Prismatic Coefficient (Cp) and Displacement Volume on Hull Resistance of Fishing Vessel by Nurul Asmarehan Binti Alias**, Matric No. **UK 17974** have been examined and all errors identified have been corrected. This report is submitted to the Department of Maritime Technology as partial fulfillment towards obtaining the **Bachelor Degree of Applied Science (Maritime Technology)**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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DECLARATION

I hereby declare that this thesis entitled **THE EFFECT OF VARYING PRISMATIC COEFFICIENT (C_p) AND DISPLACEMENT VOLUME ON HULL RESISTANCE OF FISHING VESSEL** is the result of my own research except as cited in the references.

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THE EFFECT OF VARYING PRISMATIC COEFFICIENT (C_p) AND DISPLACEMENT VOLUME ON HULL RESISTANCE OF FISHING VESSEL

ABSTRACT

There is a need to reduce the resistance of the fishing vessels. This is to reduce the economic costs incurred by the fisherman. The research is about the designation of hull boat by modifying the hull form for fishing vessel to get the minimum resistance or reduce its drag in water. In design world, one of the challenges faced by naval architecture is to select the best hull form to minimize the resistance. The main objective for this research is to design the best shape of hull boat to achieve the minimum resistance. By using the Maxsurf Professional 13 Software, it can be obtain or predict the resistance and power requirement and for the new design of optimal hull form will be produced. There are several methods in Maxsurf Professional 13 software which is Holtrop method, Compton method, Fung method, van Oortmerssen method, and Series 60. The suitable method that has been chosen for this research is Holtrop method. Holtrop method is one of the techniques widely used in prediction of resistance of displacement and semi-displacement vessels. Like all methods, however, this technique also has the own limitation. Holtrop and Mennen method is limited to a suitable range of hull form parameters. In their approach to establishing their formulas, Holtrop and Mennen assumed that the non-dimensional coefficient represents the components of resistance for a hull form. It might be represented by appropriate geometrical parameters, thus enabling each component to be expressed as a non - dimensional function of the sealing and the hull form. The findings are presented and analyzed with hydrostatic calculation after the design of hull form defined. The best hull form that chosen in minimum resistance is by decreasing value of C_p compare with the parent hull while increasing value of displacement volume. By using this method, the hull can be modified without changing the principal dimensions of the vessel. That slightly modification of the hull will minimize the resistance and enables reduced fuel consumption.

KESAN KEPELBAGAIAN NILAI C_p DAN JUMLAH SESARAN KE ATAS BADAN KAPAL BAGI KAPAL IKAN

ABSTRAK

Terdapat keperluan untuk mengurangkan rintangan kapal bagi jenis kapal ikan. Ini adalah untuk meurangkan kos ekonomi yang ditanggung oleh nelayan. Kajian ini adalah mengenai pembentukan badan kapal untuk mendapat rintangan yang minimum atau mengurangkan daya seretan di dalam air. Dalam dunia reka bentuk kapal, salah satu daripada cabaran yang dihadapi oleh para arkitek perkapalan adalah untuk memilih bentuk badan kapal yang terbaik untuk mengurangkan rintangan. Objektif utama bagi kajian ini adalah untuk mereka bentuk kapal untuk mencapai rintangan minimum. Dengan menggunakan Perisian Maxsurf Professional 13, ia boleh meramal nilai rintangan dan nilai kuasa dan reka bentuk yang baru akan dapat dihasilkan. Terdapat beberapa kaedah yang terkandung dalam perisian Maxsurf Professional 13 iaitu kaedah Holtrop, Compton, Fung, Van Oortmerssen, dan Series 60. Kaedah yang paling sesuai yang dipilih dalam kajian ini adalah kaedah Holtrop. Kaedah Holtrop adalah salah satu teknik yang digunakan secara meluas untuk meramalkan nilai rintangan. Walaubagaimana pun, seperti kaedah-kaedah yang lain, teknik ini juga mempunyai batasannya yang tersendiri. Kaedah Holtrop dan Mennen adalah terhad kepada julat yang sesuai. Dalam pendekatan untuk mewujudkan formula mereka, Holtrop dan Mennen menganggap bahawa pekali tanpa dimensi mewakili komponen rintangan untuk bentuk badan kapal. Hasilnya akan terbentuk dan akan dianalisis dengan pengiraan hidrostatik selepas reka bentuk badan kapal dibuat. Bentuk badan kapal yang terbaik yang dipilih untuk mengurangkan rintangan ialah dengan pengurangan nilai C_p dan penaikan nilai isipadu sesaran. Dengan menggunakan kaedah ini, badan kapal akan diubah suai tanpa mengubah dimensi utama kapal. Dengan pengubahsuaian yang sedikit keatas badan kapal, hasil rintangan akan berkurang dan penggunaan bahan bakar juga dapat dikurangkan.