

DESIGN AND ANALYSIS OF QUAD-CATAMARAN ON
REDUCING HULL RESISTANCE

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DESIGN AND ANALYSIS OF QUAD-CATAMARAN ON REDUCING HULL
RESISTANCE

By
CHAN SOON HONG

A thesis submitted in partial fulfillment of
the requirements for the award of the degree of
Bachelor of Applied Science (Maritime Technology)

DEPARTMENT OF MARITIME TECHNOLOGY
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
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DEPARTMENT OF MARITIME TECHNOLOGY

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**DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled: Design and Analysis of Quad-Catamaran on Reducing Hull Resistance by Chan Soon Hong, Matric No. UK 16755, 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 degree of Bachelor 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 “Design and Analysis of Quad-Catamaran on Reducing Hull Resistance” is my own research except as cited in the references.

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Date : 26th June 2012

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DESIGN AND ANALYSIS OF QUAD-CATAMARAN ON REDUCING HULL RESISTANCE

ABSTRACT

This study is to carry out the design and analysis of quad-catamaran on reducing hull resistance. Quad-catamaran is designed to be a passenger ship in 20 meters length. Due to its speed operating nature and structure, quad-catamaran is designed in limitations of size and load. From commercial view, ship owners thirst for new ship designs able to cut fuel cost and operate in a more efficient way. From technical view, high-speed catamaran hulls have significantly large resistance/weight ratio compared to conventional displacement hulls. This novel design is claimed to be able to reduce ship's hull surface frictional loss and its total resistance. These claims of quad-catamaran design come to one objective that is to increase the efficiency of conventional high-speed catamaran. Some tests have been run and specific methodology has been designed. The methodology employs Maxsurf software testing. Other measures to accomplish this study include software like Microsoft Excel and AutoCAD. Lastly, tests show positive results where total resistance generated by quad-catamaran is lesser than conventional catamaran in around 33%.

REKABENTUK AND ANALYSIS QUAD-CATAMARAN ATAS PENGURANGAN RINTANGAN HULL

ABSTRAK

Kajian ini dijalankan untuk mereka bentuk dan menganalisis kesan “quad-catamaran” untuk mengurangkan rintangan pada bahagian bawah kapal. “Quad-catamaran” ini direka sepanjang 20 meter sebagai kapal penumpang. Oleh sebab sifat kelajuannya yang tinggi dan strukturnya, “quad-catamaran” direka dengan had untuk saiz dan muatannya. Dari pandangan komersial, tuan kapal memerlukan rekaan kapal baru yang boleh mengurangkan kos minyak dan berfungsi dengan lebih cekap. Dari pandangan teknikal, “catamaran” yang berkelajuan tinggi mempunyai rintangan/berat yang besar berbanding dengan *conventional displacement hull*. Reka bentuk yang baru ini dikatakan mampu untuk mengurangkan rintangan pada bahagian bawah kapal dan rintangan keseluruhan. Tuntutan ini boleh dikatakan untuk mencapai satu objektif, iaitu untuk meningkatkan kecekapan “catamaran” berkelajuan tinggi yang tradisional. Untuk menjalankan eksperimen terhadap rekaan tersebut, kaedah spesifik telah dirancang. Kaedah tersebut menggunakan perisian percubaan Maxsurf. Selain itu, untuk menjayakan eksperimen ini, kajian ini turut menggunakan perisian seperti “Microsoft Excel” dan “AutoCAD”. Akhir sekali, eksperimen menunjukkan keputusan positif, iaitu rintangan keseluruhan “quad-catamaran” adalah lebih kecil daripada rintangan keseluruhan “catamaran” tradisional sebanyak 33%.