

RESISTANCE PREDICTION OF TRIMARAN SHIP IN WAVES

SYED MOHD FAIZAL BIN SYED MOHD JAFRI

FACULTY OF MARITIME STUDIES AND SCIENCE MARINE
UNIVERSITY MALAYSIA TERENGGANU

2013

A RESISTANCES PREDICTION OF TRIMARAN SHIP IN WAVES

By

SYED MOHD FAIZAL BIN SYED MOHD JAFRI

UK 19240

**Research Thesis Submitted in Partial Fulfillment of the Requirements for the
Bachelor's Degree of Applied Science (Maritime Technology)**

**DEPARTMENT OF MARITIME TECHNOLOGY
FACULTY OF MARITIME AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU**

2013



DEPARTMENT OF MARITIME TECHNOLOGY
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU

DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled:

Resistance Prediction of Trimaran Ship in Waves by Syed Mohd Faizal Bin Syed Mohd Jafri, Matric No. UK 19240 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.

Verified by:



.....
DR. ENG. AHMAD FITRIADHY
LECTURER
DEPARTMENT OF MARINE TECHNOLOGY
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU (UMT)
21030 KUALA TERENGGANU

Main Supervisor

Name: **Dr. Eng. Ahmad Fitriadhy**

Official stamp:

Date : 16/01/2013


.....

Head Department of Maritime Technology

Name: **Dr. Mohamad Fadhli bin Ahmad**


Official stamp:

Date: 16/1/13

ASSOC. PROF. DR. MOHAMMAD FADHLI AHMAD
HEAD
DEPARTMENT OF MARITIME TECHNOLOGY
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU (UMT)
21030 KUALA TERENGGANU

DECLARATION

I hereby declare that this thesis entitled “A Resistances Prediction of Trimaran Ship in Waves” is my own research except as cited in the references.

Signature : 
Name : Syed Mohd Faizal B Syed Mohd Jafri
Matrix No. : UK 19240
Date : 16/01/2013

ACKNOWLEDGEMENTS

Firstly, praised to Allah SWT, the Most Gracious and Most Merciful, Who created all the knowledge in the world, as guidance to mankind to always faith in Him, wisdom and power blessing me and give me a capability to complete this final year project. I like to express my deepest gratitude for a spiritual support and emotional understanding that i received from my beloved father and mother that is Syed Mohd Jafri Bin Syed Arrifin and Raba'ai Binti Said. I am thankful to all the love that is given to me, inspires me to always do not give up and can solve the difficulties that encounter during to complete the thesis successfully.

In particular, the person I most wish to express my deepest appreciation and extend gratitude is supervisor, Dr Ahmad Fitriadhy for his encourage and guidance for my final year project. Also appreciation goes to En Shamsul Affendi Azmi as my second supervisor. Their generosity, patient, tolerance and helping character nourished me and more than what I gained through successful completion of thesis.

I am also appreciating a helping hand from lectures Department of Maritime Technology for giving knowledge directly or indirectly during my search for knowledge here.

My thank also extended to all my friend here Khairun Naim Tahir, Faiq Fawwaz Jamalluddin, Syauti Abd Rahim, Halim Md Ali, Farhan Kassim, Aslam, Syukri Salehuddin, Zakir Mat Lazi, WM Mursyid and others. Thanks to all my friends who assisted and encourage me during this project.

ABSTRACT

Nowadays, multihull high speed vessels have widely used for both military and transportation services. Many researchers are trying to exploring the potential of new hull forms as part of efforts to achieve ship transformation in military and transportation sector. To fulfill the above demands, many researchers propose unconventional hull forms in order to balance speed with payload requirements. One such hull form is the trimaran ship. The purpose of this thesis is to predict trimaran ship's resistance in waves by using CFD (Computational Fluid Dynamics) simulation. This simulation will use two software applications of Maxsurf and ANSYS FLUENT. Trimaran ships with variation of outrigger will be testing in various of wave condition and ship speed. With the help of current technology, this project has tremendous potential to contributing the knowledge in ship design field especially to identify ship resistance in waves.

ABSTRAK

Pada masa kini, kapal 'multihull' berkelajuan tinggi telah digunakan secara meluas di dalam bidang ketenteraan dan khidmat pengangkutan penumpang. Ramai penyelidik cuba meneroka potensi rekabentuk kapal baru ini sebagai sebahagian daripada usaha untuk mencapai transformasi di dalam sektor ketenteraan dan pengangkutan penumpang. Untuk memenuhi permintaan diatas, ramai penyelidik mencadangkan rekabentuk kapal bukan konvensional bagi mengimbangi kelajuan dan keperluan muatan. Salah satu rekabentuk kapal ini adalah kapal trimaran. Tujuan kajian didalam thesis ini adalah untuk meramalkan rintangan kapal trimaran dalam variasi keadaan ombak dan kelajuan kapal menggunakan simulasi CFD (Komputasi Dinamik Bendalir). Simulasi ini akan menggunakan dua aplikasi perisian Maxsurf dan ANSYS FLUENT. Kapal trimaran dengan perubahan sisi badan kapal (outrigger) akan diuji dalam perubahan gelombang ombak dan kelajuan kapal. Dengan adanya bantuan teknologi pada masa kini, projek ini mempunyai potensi yang amat besar untuk menyumbang pengetahuan dalam bidang perkapalan terutamanya dari segi rintangan kapal pada masa kini.