

**FINITE ELEMENT ANALYSIS OF AMIDSHIP COMPARTMENT
OF MONOHULL RESEARCH VESSEL**

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**FINITE ELEMENT ANALYSIS OF AMIDSHIPS COMPARTMENT OF MONOHULL
RESEARCH VESSEL**

By

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**Research report submitted in partial fulfillment
The requirements for award of the degree of
Bachelor of Applied Science (Maritime Technology)**

**MARITIME TECHNOLOGY DEPARTMENT
FACULTY OF MARITIME STUDIES AND MARINE SCIENCES
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**DEPARTMENT OF MARITIME TECHNOLOGY
FACULTY OF MARITIME STUDIES AND MARINE
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**DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT**

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

Finite Element Analysis Of Amidships Compartment Of Monohull Research Vessel by Lee Xiang Ming, Matric No. UK 16480 have been examined and all errors identified have been corrected. This report is submitted to the Department of Marine Science 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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FINITE ELEMENT ANALYSIS OF AMIDSHIPS COMPARTMENT OF MONOHULL RESEARCH VESSEL

Abstract

The finite element simulation results of the monohull amidships subjected to vertical bending moment are presented. The simulated structures are made of aluminum alloy 5083 H116, 6061 T6, 6082 T5, mild steel S235, high tensile steel S355 of nominal ultimate stress reinforced with extruded part of the same material. Besides that, two cases with hull using aluminum alloy 5083 H116 combine with extruded part using aluminum alloy 6061 T6 and 6082 T5 respectively were also generated. The bending moment curvature curves are presented covering the ultimate bending moment of sagging and hogging analysis of each case with the deflection of each model at the ultimate bending moment has been predicted. The study was also including the comparisons of all cases regarding to the ultimate bending moment, maximum stress distribution at the model local panel and the model global ultimate strength. In the final part of the study, the modes of collapse for each model's keels and center girder are discussed. The concept is very useful to identify the governing parameters affecting the ultimate strength of 3D structures under predominant bending moment.

ANALISIS ELEMEN TERHINGGA BAGI BAHAGIAN PEMINGGANG KAPAL PENYELIDIKAN BERBADAN TUNGGAL

ABSTRAK

Keputusan simulasi elemen terhingga bagi peminggang badan kapal tunggal yang tertakluk kepada momen lentur menegak telah dibentangkan. Lima kes simulasi dengan struktur model kapal yang dihasilkan daripada aloi aluminium 5083 H116, 6061 T6, 6082 T5, keluli lembut S235, serta keluli tegangan tinggi S355 dan diperkukuh dengan bahagian diekstrusi daripada bahan yang sama. Selain itu, dua kes dengan plat badan kapal menggunakan aloi aluminium 5083 H116 bergabung dengan bahagian diekstrusi bagi kes masing-masing menggunakan aloi aluminium 6061 T6 dan 6082 T5 juga dihasilkan. Graf momen lentur yang dibentangkan telah meliputi momen lentur mutlak semasa fenomena kapal mengendur dan fenomena kapal meleding bagi setiap kes kajian dengan pesongan model pada momen lentur mutlak diramalkan. Kajian ini juga merangkumi perbandingan antara semua kes kepada momen lentur mutlak, taburan tekanan maksimum terhadap bahagian lokal dan kekuatan mutlak global model. Di bahagian akhir kajian ini, mod runtuh untuk bahagian lunas dan galang tengah setiap model juga diperbincangkan. Konsep ini adalah sangat berguna untuk mengenalpasti parameter yang mempengaruhi kekuatan muktamad struktur 3D di bawah momen lentur dominan.