

SIMULATION OF BUFFER BOW ON AXIAL CRUSHING

MUHAMMAD SYAFIQ IZWAN KAMARUDIN

bpd
LP
37
FMSM
1
2013

SCHOOL OF MARITIME STUDIES AND SCIENCE MARINE
UNIVERSITY MALAYSIA TERENGGANU
2013

no. 8466

1100087877

Perpustakaan Sultanah Nur Zahirah
Universiti Malaysia Terengganu (UMT)



bpd

LP 37 FMSM 1 2013



1100087877

Simulation of buffer bow on axial crushing / Muhammad Syafiq
Izwan Kamarudin.

PERPUSTAKAAN SULTANAH NUR ZAHIRAH
UNIVERSITI MALAYSIA TERENGGANU (UMT)
21030 KUALA TERENGGANU

1100087877

Line 10/10

HAK MILIK
PERPUSTAKAAN SULTANAH NUR ZAHIRAH UMT

SIMULATION OF BUFFER BOW ON AXIAL CRUSHING

Muhammad Syafiq Izwan Kamarudin

**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 STUDY AND MARINE SCIENCE
UNIVERSITY MALAYSIA TERENGGANU**

2013



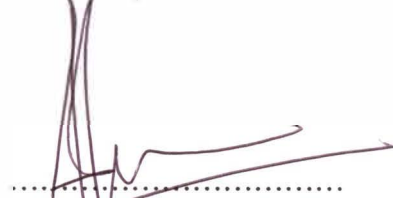
DEPARTMENT OF MARITIME TECHNOLOGY
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU

DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT

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


Simulation of Buffer Bow on Axial Crushing by Muhammad Syafiq Izwan No UK 19913 have been examined and all error identified have been corrected. This report is submitted to Department of Maritime Technology as partial fulfillment toward obtaining the Degree of Bachelor of Applied Science (Maritime Technology), Universiti Malaysia Terengganu.

Verified by:



Principal Supervisor
 Name: Mr. Anuar Abu Bakar
 Official stamp:

Date: 13/1/2013



Co-Supervisor
 Name: Mr. Che Wan Mohd Noor
 Official stamp:

CHE WAN MOHD NOOR
 PENSYARAH
 JABATAN TEKNOLOGI MARITIM
 FAKULTI PENGAJIAN MARITIM DAN SAINS MARIN
 UNIVERSITI MALAYSIA TERENGGANU (UMT)
 21030 KUALA TERENGGANU

Date: 14/1/2013



Head of Department of Maritime Technology
 Name: Assoc. Prof. Dr. Mohamad Fadhli Ahmad
 Official stamp:

Date: 15/1/13

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 entitle Simulation of Buffer Bow on Axial Crushing is the result of my own research except as cited in the references.

Signature: 

Name: Muhammad Syafiq Izwan Kamarudin

Matrix No: UK 19913

Date: 13 January 2013

ACKNOWLEDGEMENTS

First and foremost, I would like to acknowledge to my supervisor, Mr Anuar Abu Bakar and Mr. Che Wan Mohd Noor for guidance and supervision along the research been carried out. Nevertheless to express thanks and gratitude to my supervisor who had shared and give knowledge of using ABAQUS and suggested the very useful proposition in my research. Beside that an appreciation thanks to JTM staff that had lent some help for me to run simulation in the JTM cabin. Furthermore, thanks to all my peers from Maritime Technology studies for lending their precious time to helping me completing the project Last and most important, thanks to my family especially my parent that gives support in terms of spiritual and financial. I will not forget and appreciate the gift from them for me to running the project.

Simulation of Buffer Bow on Axial Crushing

Abstract

The purpose of this study is to investigate the effect of mesh sizes, plate thickness and crushing force of a bulbous bow. The simulations only consider the lateral collision of crushing plate between bulbous bows and the results is compared with available experimental data. (Endo, Yamada et al. 2002) simplified experiments models are used in this study and couple with FLD damage criteria to predict collapse mechanism and rupture of bulbous bow. The simulation analyses also take into consideration of speed of crushing plate that crush the bulbous bow. Throughout the analysis mild steel S235JR material properties is adopted and coefficient of friction is set as 0.3 for general contact friction of mild steel. The mesh sizes, plate thickness and speed of crushing plate are set from (20mm-50mm), (10mm – 25mm) and (0.6m/s – 5m/s) respectively. The FLD damage criteria is discussed and the results gave a good correlation between (Endo, Yamada et al. 2002) experimental data and finite element analysis.

Simulasi Buffer Bow pada penghancuran tegak

Abstrak

Tujuan kajian ini adalah untuk mengenalpasti kesan bulbous bow daripada perubahan saiz mesh, ketebalan plat dan daya hentaman. Simulasi ini hanya mengambil kira pelanggaran secara menegak antara plat dan bow. Hasilnya dibandingkan dengan data eksperimen yang sedia ada. (Endo, Yamada et al. 2002) eksperimen model ringkas digunakan di dalam kajian ini dan digandingkan dengan FLD kriteria kerosakan untuk menentukan mekanism runtuh dan hancur bow. Kelajuan hentaman juga diambilkira semasa penghancuran bow. Di dalam analisa kajian ini, material S235JR keluli lembut digunakan dan pekali geseran ditetapkan pada nilai 0.3 untuk geseran pertemuan. Saiz mesh, ketebalan plat, dan kelajuan hentaman ditetapkan dari (20mm-50mm), (10mm – 25mm) dan (0.6m/s – 5m/s). FLD kriteria kehancuran dibincangkan dan memberi hasil yang memberangsangkan dengan (Endo, Yamada et al. 2002) data eksperimen dan analisa finite element.