

MOORING ANALYSIS OF OFFSHORE AQUACULTURE MARINE  
TECHNOLOGY SYSTEM FOR OCEAN FARMING

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**MOORING ANALYSIS OF OFFSHORE AQUACULTURE MARINE TECHNOLOGY  
SYSTEM FOR OCEAN FARMING**

**By**

**ASWAD ASLAMY BIN ISHAK**

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

**DEPARTMENT OF MARITIME TECHNOLOGY  
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UNIVERSITI MALAYSIA TERENGGANU**

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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 entitled: **Mooring Analysis Of Offshore Aquaculture Marine Technology System For Ocean Farming** by **Aswad Aslamy Bin Ishak**, Matric No. **UK 17429** has 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 **MOORING ANALYSIS OF OFFSHORE AQUACULTURE MARINE TECHNOLOGY SYSTEM FOR OCEAN FARMING** is the result of my own research except as cited in the references.

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## **MOORING ANALYSIS OF OFFSHORE AQUACULTURE MARINE TECHNOLOGY SYSTEM FOR OCEAN FARMING**

### **ABSTRACT**

The expansion of near-shore aquaculture is becoming more difficult because of multi-use issues and environmental impact concerns, the feasibility of moving aquaculture into the open ocean is being studied. However, natural disasters such as hurricanes and storms can cause severe damage to the integrity of structural floating system. To avoid mooring system failure, selecting an appropriate breaking strength for mooring lines is becoming an important issue in marine aquaculture industry. The study evaluates the secure of a mooring system based on environmental loadings. To enable the optimum design and performance a mooring system in the energetic open ocean, numerical modeling techniques and model testing are being utilized. The numerical model employs the analysis approach in which wave and current loadings on anchor, buoy and lines elements that drive the system dynamics. The validity of numerical evaluation was then compared with model experiments carried out in the Towing Tank at Marine Technology Laboratory, UTM. Understanding these differences will help to establish appropriate safety factors when designing large marine offshore farms using the model.

## **ANALISIS TAMBATAN SISTEM TEKNOLOGI MARIN AKUAKULTUR LUAR PESISIR UNTUK PENTERNAKAN LAUT**

### **ABSTRAK**

Sejak perkembangan akuakultur di pesisir pantai menjadi semakin sukar kerana pelbagai isu dan kebimbangan kesan kepada persekitaran, kemungkinan peralihan akuakultur ke laut terbuka sedang dikaji. Walaubagaimanapun, bencana alam seperti taufan dan rebut boleh menyababkan kerosakan teruk kepada keampuhan struktur system terapung. Untuk mengelakkan kegagalan system tambatan, pemilihan kekuatan bagi talian tambatan menjadi isu penting dalam industri marin akuakultur. Kajian ini menilai kadar selamat bagi system tambatan berdasarkan beban yang dialami sesuatu struktur itu disebabkan oleh alam sekitar. Bagi membolehkan reka bentuk optimum dan penilaian prestasi tambatan di lautan terbuka, teknik pemodelan berangka digunakan. Model berangka menggunakan pendekatan analisis di mana gelombang dan arus beban pada sauh, boya dan unsur-unsur garisan yang memacu system dinamik. Memahami perbezaan ini akan membantu untuk mewujudkan factor keselamatan yang sesuai semasa mereka bentuk pusat akuakultur yang besar di luar pesisir pantai.