

DESIGN AND MODELLING OF WAVE AND SOLAR
ENERGY ABSORBER (SUNWAVE)

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UNIVERSITI MALAYSIA TERENGGANU
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**DESIGN AND MODELLING OF WAVE AND SOLAR ENERGY ABSORBER
(SUNWAVE)**

**BY
MUHAMMAD AIZAT BIN MOHD KHALID**

A thesis submitted in partial fulfillment of
the requirement 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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**DECLARATION AND VERIFICATION REPORT
 FINAL YEAR RESEARCH PROJECT**

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

Design and Modelling of Wave and Solar Energy Absorber by Muhammad Aizat bin Mohd Khalid, Matric No. **UK 16685** 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.

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DECLARATION

I hereby declare that this thesis entitled “Design and modeling of wave and solar energy absorber” is the result of my own research except as cited in the references.

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DESIGN AND MODELLING OF WAVE AND SOLAR ENERGY ABSORBER (SUNWAVE)

ABSTRACT

Energy is like a breathing aid to modern civilizations. The rising of electricity tariff and fossil fuel price in Malaysia has triggered the awareness to find alternative energy as sustainable energy sources. Development and economic growth continue to affect the energy consumption in Malaysia, thus fossil fuel demand were increase and this situation can lead to global warming effect. This study discusses about the development of two wave and solar energy absorber prototypes which were called 'SUNWAVE'. The development consists of design and modeling, prototypes construction and development, prototypes testing and data analysis. Two SUNWAVE prototypes that already been developed were SUNWAVE GEAR and SUNWAVE ROTATING ARM. SUNWAVE GEAR was concluded to be the best prototype compare to SUNWAVE ROTATING ARM based on the average power generated per one hour. SUNWAVE GEAR have collected average power of 19.1373 W/h while SUNWAVE ROTATING ARM have collected average power of 19.11289 W/h. By combining two source of renewable energy, which is from wave and solar, new source of alternative electricity were develop.

REKABENTUK DAN PERMODELAN PENYERAP TENAGA OMBAK DAN SOLAR (SUNWAVE)

ABSTRAK

Tenaga adalah seperti bantuan pernafasan kepada tamadun moden. Kenaikan tarif elektrik dan harga bahan api fosil di Malaysia telah mencetuskan kesedaran untuk mencari tenaga alternatif sebagai sumber tenaga yang mampan. Pembangunan dan pertumbuhan ekonomi terus mempengaruhi penggunaan tenaga di Malaysia, oleh itu permintaan bahan api fosil semakin meningkat dan keadaan ini boleh membawa kepada kesan pemanasan global. Kajian ini membincangkan tentang rekacipta dua prototaip penyerap tenaga dari ombak dan solar yang dipanggil 'SUNWAVE'. Rekacipta ini terdiri daripada reka bentuk dan pemodelan, pembinaan dan pembangunan prototaip, pengujian prototaip dan analisis data. Dua prototaip SUNWAVE yang telah dibangunkan adalah SUNWAVE GEAR dan SUNWAVE ROTATING ARM. SUNWAVE GEAR disimpulkan sebagai prototaip yang terbaik berbanding dengan SUNWAVE ROTATING ARM berdasarkan kuasa purata yang dijana dalam masa satu jam. SUNWAVE GEAR mengumpul kuasa purata 19.1373 W / j manakala SUNWAVE ROTATING ARM mengumpul kuasa purata 19.11289 W / j. Dengan menggabungkan dua sumber tenaga boleh diperbaharui, iaitu dari ombak dan solar, sumber baru elektrik alternatif dapat dibangunkan.