

ABSTRAK

Energi gelombang laut yang merupakan energi terbarukan dan khususnya di Indonesia sangat berpotensi untuk dikembangkan dan dimanfaatkan menjadi energi pembangkit listrik yang tidak ternilai harganya. Tujuan pada penelitian ini yaitu memverifikasi kinerja prototipe mesin Konverter Energi Gelombang (KEG) menggunakan genetaror dengan *planetary* dan tanpa *planetary*. Osilasi *pitching* ponton berprinsip *azas* getaran paksa tak teredam menggunakan nilai konstanta pegas untuk mendapatkan nilai energi pegas yang optimal. Penelitian dilakukan dengan uji eksperimen darat di perumahan Joglo dan Pengujian eksperimen di laut di Tanjung Pasir Tangerang. Dimana hasil Tegangan Eksperimen di darat tanpa *planetary* terendah sebesar 4,8 Volt dan tertinggi adalah 6,73 Volt. Sedangkan tegangan menggunakan *planetary* terendah sebesar 15,4 Volt dan tertinggi sebesar 25,8 Volt. Hasil Arus listrik di darat tanpa *planetary* terendah sebesar 0,18 Ampere dan tertinggi sebesar 0,80 Ampere. Sedangkan hasil dari menggunakan *planetary* terendah adalah 1,86 Ampere dan hasil tertinggi sebesar 5,76 Ampere. Hasil eksperimen laut di peroleh tegangan terendah pada waktu pengujian pertama di jam 10.30 WIB – 11.00 WIB sebesar 9,4 volt dan tertinggi pada waktu pengujian ke-enam di jam 16.00 WIB – 16.30 WIB sebesar 37,07 Volt. Hasil arus listrik terendah pada ujian Pertama di jam 10.30 WIB – 11.00 WIB sebesar 3,11 Ampere dan tertinggi pada ujian ke-enam sebesar 11,82 Ampere Dan hasil daya terendah pada eksperimen darat tanpa *planetary* sebesar 0,86 Watt dan tertinggi adalah 5,38 Watt. Sedangkan hasil daya pada eksperimen laut terendah pada waktu pengujian ke-1 di jam 10.30 WIB – 11.00 WIB sebesar 37,31 Watt dan tertinggi di hasilkan pada pengujian ke-6 di jam 16.00 WIB – 16.30 sebesar 467 Watt

Kata kunci: Perangkat KEG; *Pitching*; *Power Take Off (PTO)*; azas getaran paksa ; efisiensi perangkat KEG.

ANALYSIS OF WAVE ENERGY CONVERTER (KEG) DUE TO MASS LOAD PITCHING MOTION 50 KG

ABSTRACT

Ocean wave energy is a renewable energy and especially in Indonesia has great potential to be developed and utilized to become invaluable electricity generation energy. The aim of this research is to verify the performance of a prototype Wave Energy Converter (KEG) machine using generators with planetaries and without planetaries. Pontoon pitching oscillation is based on the principle of undamped forced vibration using the spring constant value to obtain the optimal spring energy value. The research was carried out with land experimental tests at the Joglo housing complex and experimental tests at sea in Tanjung Pasir Tangerang. Where the experimental voltage results on land without a planetary were the lowest at 4.8 Volts and the highest was 6.73 Volts. Meanwhile, the lowest voltage using planetary is 15.4 Volts and the highest is 25.8 Volts. Results: The lowest electric current on land without a planetary is 0.18 Amperes and the highest is 0.80 Amperes. Meanwhile, the lowest result from using a planetary is 1.86 Amperes and the highest result is 5.76 Amperes. The results of marine experiments showed that the lowest voltage was obtained during the first test at 10.30 WIB - 11.00 WIB, amounting to 9.4 volts and the highest during the sixth test at 16.00 WIB - 16.30 WIB, amounting to 37.07 Volts. The lowest electric current result in the first test at 10.30 WIB - 11.00 WIB was 3.11 Amperes and the highest in the sixth test was 11.82 Amperes. And the lowest power result in the land experiment without a planetary was 0.86 Watts and the highest was 5.38 Watt. Meanwhile, the lowest power results in the marine experiment were during the 1st test at 10.30 WIB - 11.00 WIB, amounting to 37.31 Watts and the highest were produced during the 6th test at 16.00 WIB - 16.30 WIB, amounting to 467 Watts

Keywords: *KEG device; Pitching; Power Take Off (PTO); the principle of forced vibration; KEG device efficiency.*