

ABSTRAK ANALISIS PENGARUH TINGGI GELOMBANG TERHADAP KARAKTERISTIK KELUARAN PADA RANCANG BANGUN PLTGL TIPE OWSC MENGGUNAKAN KOLAM GELOMBANG BUATAN

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Penelitian ini bertujuan menganalisis pengaruh variasi tinggi gelombang terhadap karakteristik keluaran listrik (arus, tegangan, daya, dan frekuensi) pada rancang bangun PLTGL tipe OWSC berskala laboratorium dengan menggunakan kolam gelombang buatan (*wave tank*). Pengujian dilakukan dengan jenis beban listrik lampu pijar 40 Watt tunggal, terhubung seri, dan paralel. Hasil pengujian menunjukkan arus keluaran generator bervariasi antara 0,03–0,08 A keluaran berkisar antara 8,4–11,1 Volt dan cenderung menurun seiring bertambahnya beban listrik. Daya listrik keluaran tertinggi sebesar 0,672Watt diperoleh pada pengujian beban lampu seri, dan meningkat sejalan dengan bertambahnya tinggi gelombang. Frekuensi listrik juga meningkat dari 2,41 Hz hingga 5,25 Hz seiring meningkatnya kecepatan putaran generator akibat periode gelombang yang semakin singkat. Secara keseluruhan, hasil penelitian membuktikan bahwa tinggi gelombang berpengaruh signifikan terhadap arus, tegangan, daya, dan frekuensi listrik yang dihasilkan oleh sistem PLTGL tipe OWSC menggunakan kolam gelombang buatan.

Kata kunci: Pembangkit Listrik, OWSC, tinggi gelombang, kolam gelombang buatan, energi terbarukan.

**ANALYSIS OF THE EFFECT OF WAVE HEIGHT ON OUTPUT
CHARACTERISTICS IN THE DESIGN OF AN OWSC-TYPE OCEAN
WAVE POWER PLANT (PLTGL) USING AN ARTIFICIAL WAVE POOL
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This study aims to analyze the effect of wave height variation on the electrical output characteristics (current, voltage, power, and frequency) of a laboratory-scale Oscillating Wave Surge Converter (OWSC) type Wave Energy Power Plant (PLTGL) using an artificial wave tank. Testing was carried out using a 40-Watt incandescent lamp load, connected singly, in series, and in parallel. The test results showed that the generator's output current varied between 0.03–0.08 A, while the output voltage ranged from 8.4–11.1 Volts and tended to decrease as the electrical load increased. The highest electrical output power of 0.672 Watt was obtained during testing with the series lamp load, and increased in line with the increase in wave height. The electrical frequency also increased from 2.41 Hz to 5.25 Hz as the generator's rotational speed increased due to the shortening wave period. Overall, the results of this study prove that wave height has a significant effect on the current, voltage, power, and frequency of electricity generated by the OWSC-type PLTGL system using an artificial wave tank.

Keywords: Power Plant, OWSC, wave height, artificial wave pool, renewable energy.