

ABSTRAK
PEMODELAN DAN ANALISIS KARAKTERISTIK TEGANGAN
KELUARAN PADA RANCANG BANGUN PLTGL
TIPE OWSC MENGGUNAKAN SIMULINK

(2026 : xvii + 85 halaman + Daftar Pustaka + Lampiran)

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Penelitian ini bertujuan memodelkan sistem Pembangkit Listrik Tenaga Gelombang Laut (PLTGL) tipe *Oscillating Wave Surge Converter* (OWSC) menggunakan MATLAB Simulink serta menganalisis karakteristik tegangan keluaran berdasarkan variasi tinggi dan periode gelombang laut. Pemodelan dilakukan menggunakan blok gelombang, *gearbox*, generator *Permanent Magnet Synchronous Machine* (PMSM), penyearah, kapasitor filter, baterai, inverter, dan beban resistif. Data simulasi menggunakan data gelombang laut BMKG tanggal 11 Juli 2026 menunjukkan bahwa kondisi rendah ($H = 1,30$ m; $T = 5,7$ s) menghasilkan Tegangan 202 V, Arus 4,04 A, dan Daya 816,08 W; kondisi menengah ($H = 1,40$ m; $T = 5,9$ s) menghasilkan Tegangan 204 V, Arus 4,08 A, dan Daya 832,32 W; sedangkan kondisi tinggi ($H = 1,50$ m; $T = 6,1$ s) menghasilkan Tegangan 205 V, Arus 4,10 A, dan Daya 840,50 W. Pada 12 Juli 2026, kondisi rendah ($H = 1,10$ m; $T = 5,2$ s) menghasilkan Tegangan 201 V, Arus 4,02 A, dan Daya 808,02 W, sedangkan kondisi menengah ($H = 1,20$ m; $T = 5,5$ s) menghasilkan Tegangan 203 V, Arus 4,06 A, dan Daya 824,18 W.

Kata Kunci: Pembangkit Listrik, Gelombang, Simulink, Tegangan, Arus.

ABSTRACT
MODELLING AND ANALYSIS OF OUTPUT VOLTAGE
CHARACTERISTIC FOR AN OWSC TYPE
WAVE POWER PLANT DESIGN
USING SIMULINK

(2026 : xvii + 85 Pages + Bibliography + Appendices)

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This study aims to model an Oscillating Wave Surge Converter (OWSC)-based Wave Power Plant (PLTGL) system using MATLAB Simulink and analyze its output voltage characteristics based on variations in wave height and wave period. The model consists of a wave source, gearbox, Permanent Magnet Synchronous Machine (PMSM) generator, rectifier, filter capacitor, battery, inverter, and resistive load. The simulation used ocean wave data from the Indonesian Agency for Meteorology, Climatology, and Geophysics (BMKG). The simulation results based on BMKG data on July 11, 2026, showed that the low condition ($H = 1.30$ m; $T = 5.7$ s) produced an output voltage of 202 V, current of 4.04 A, and power of 816.08 W; the medium condition ($H = 1.40$ m; $T = 5.9$ s) produced 204 V, 4.08 A, and 832.32 W; while the high condition ($H = 1.50$ m; $T = 6.1$ s) produced 205 V, 4.10 A, and 840.50 W. On July 12, 2026, the low condition ($H = 1.10$ m; $T = 5.2$ s) produced 201 V, 4.02 A, and 808.02 W, whereas the medium condition ($H = 1.20$ m; $T = 5.5$ s) produced 203 V, 4.06 A, and 824.18 W.

Keywords: *Power Plant, Wave, Simulink, Voltage, Current*