ABSTRAK

ANALISA KINERJA DAN *PERFORMANCE RATIO* PEMBANGKIT LISTRIK TENAGA SURYA (PLTS) 2 MW JAKABARING DENGAN KONFIGURASI INVERTER 8 X 250 KW

(2026 : xvi + 60 halaman + Daftar Gambar + Daftar Tabel + Lampiran)

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Penelitian ini mengevaluasi kinerja Pembangkit Listrik Tenaga Surya (PLTS) Jakabaring berkapasitas 2 MW dengan konfigurasi 5.248 modul fotovoltaik 315 Wp dan 8 inverter 250 kW, menggunakan standar IEC 61724-1:2021 melalui perhitungan *Reference Yield* (Yr), *Final Yield* (Yf), *Performance Ratio* (PR), dan *Capacity Utilization Factor* (CUF). Hasil analisis menunjukkan nilai CUF tahunan sebesar 9,25% dan efisiensi inverter berkisar 93,6%–96%, keduanya berada pada rentang yang wajar. Namun ditemukan anomali signifikan pada nilai PR yang berkisar 116,34%–127,10%, jauh melampaui standar industri 75%–85%. Melalui evaluasi mendalam, anomali ini disimpulkan bukan berasal dari kinerja fisik sistem, melainkan dari kegagalan instrumentasi sensor iradiasi akibat tiga faktor: pembacaan rendah secara kronis (*under-read*), kesalahan sudut pemasangan sensor (*misalignment error*), dan pergeseran kalibrasi titik nol (*zero offset error*). Secara keseluruhan, PLTS 2 MW Jakabaring tetap beroperasi normal dan andal dalam menyalurkan energi ke jaringan PT PLN.

Kata Kunci: PLTS, *Performance Ratio*, Anomali Sensor, CUF, IEC 61724-1.

ABSTRACT

PERFORMANCE ANALYSIS AND PERFORMANCE RATIO OF THE 2 MW JAKABARING SOLAR POWER PLANT (PLTS) WITH AN 8 X 250 KW INVERTER CONFIGURATION

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This study evaluates the performance of the 2 MW Jakabaring Solar Power Plant (PLTS), configured with 5,248 photovoltaic modules of 315 Wp and 8 inverters of 250 kW, using the IEC 61724-1:2021 standard through calculation of Reference Yield (Yr), Final Yield (Yf), Performance Ratio (PR), and Capacity Utilization Factor (CUF). Results show an annual CUF of 9.25% and inverter efficiency ranging from 93.6%–96%, both within acceptable ranges. However, a significant anomaly was found in the PR values, ranging from 116.34%–127.10%, far exceeding the industry standard of 75%–85%. Through in-depth evaluation, this anomaly was concluded to originate not from the physical performance of the system, but from irradiance sensor instrumentation failure due to three factors: chronic under-reading, sensor installation misalignment, and zero offset calibration error. Overall, the 2 MW Jakabaring PLTS remains mechanically and electrically Operasional, continuously supplying energy to the PT PLN grid.

Keywords**:** *Solar Power Plant, Performance Ratio, Sensor Anomaly*, CUF, IEC 61724-1.