

ABSTRAK
ANALISA TAHANAN ISOLASI GENERATOR SEBELUM DAN
SESUDAH PERBAIKAN BERBASIS INDEKS POLARISASI DI PLN
KERAMASAN

(2026: XIV + 50 Halaman + Daftar Gambar + Daftar Tabel + Lampiran)

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Penelitian ini bertujuan untuk menganalisis kondisi tahanan isolasi stator generator sebelum dan sesudah perbaikan menggunakan metode Polarization Index (PI) di PT PLN Indonesia Power UBP Keramasan Palembang. Pengujian dilakukan menggunakan Insulation Tester Model 3125 dengan tegangan uji 5000 VDC pada titik pengukuran fasa-ground dan fasa-fasa. Hasil pengukuran sebelum perbaikan menunjukkan nilai tahanan isolasi berada pada rentang 99–632 M Ω dengan nilai PI sebesar 0,96–1,43 yang termasuk kategori sangat buruk hingga buruk menurut IEEE Std 43-2000. Setelah dilakukan perbaikan, nilai tahanan isolasi meningkat signifikan menjadi 10,2–100,2 G Ω dengan nilai PI sebesar 4,17–5,05 yang termasuk kategori sangat baik. Nilai PI tertinggi diperoleh pada titik T-Ground sebesar 5,05, sedangkan nilai terendah sebesar 4,17 pada titik R-Ground dan S-T. Hasil penelitian menunjukkan bahwa tindakan perbaikan berhasil meningkatkan kualitas isolasi stator generator sehingga layak dioperasikan kembali secara aman dan andal sesuai standar IEEE Std 43-2000.

Kata Kunci: Tahanan, Polarization Index, generator sinkron, IEEE Std 43-2000.

ABSTRACT
ANALYSIS OF GENERATOR INSULATION RESISTANCE BEFORE AND
AFTER MAINTENANCE BASED ON THE POLARIZATION INDEX
METHOD AT PLN KERAMASAN

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This study aims to analyze the condition of generator stator insulation resistance before and after maintenance using the Polarization Index (PI) method at PT PLN Indonesia Power UBP Keramasan Palembang. The testing was carried out using an Insulation Tester Model 3125 with a test voltage of 5000 VDC at phase-to-ground and phase-to-phase measurement points. The results before maintenance showed that the insulation resistance values ranged from 99 to 632 MΩ, with PI values between 0.96 and 1.43, which are classified as very poor to poor according to IEEE Std 43-2000. After maintenance, the insulation resistance values increased significantly to a range of 10.2–100.2 GΩ, while the PI values improved to 4.17–5.05, which fall into the very good category. The highest PI value was obtained at the T-Ground point with a value of 5.05, while the lowest PI value was 4.17 at the R-Ground and S-T points. The results indicate that the maintenance process successfully improved the quality of the generator stator insulation system, making it suitable for safe and reliable operation in accordance with IEEE Std 43-2000.

Keywords: Resistance, Polarization Index, Synchronous Generator, IEEE Std 43-2000.