

ABSTRAK

PENGARUH POLUSI ABU BATUBARA TERHADAP ARUS BOCOR DAN *FLASHOVER* ISOLATOR PORSELIN *OUTDOOR*

(2026 : xv + 51 halaman + 12 Gambar + 4 Tabel + Lampiran)

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Penelitian ini mengkaji pengaruh polusi abu batubara (*fly ash*) terhadap arus bocor (*leakage current*) dan risiko *Flashover* pada isolator porselin luar ruangan. Metode eksperimen nyata (*true experimental research*) digunakan melalui observasi langsung dan pengukuran arus bocor menggunakan *clamp ampere* pada kabel *grounding* transformator distribusi 20 kV di PT. BEST Tanjung Enim. Kerana keterbatasan alat, analisis karakteristik *Flashover* disokong melalui studi literatur dan komparasi data sekunder. Hasil pengujian lapangan pada 11–13 Mei 2026 menunjukkan nilai arus bocor sebesar 0,0 A (0 μ A) tanpa tanda-tanda *Flashover*, mengindikasikan isolator masih dalam kondisi baik. Sebaliknya, data rujukan jurnal berasaskan ujian maksimal menunjukkan kenaikan arus bocor daripada 83,30 μ A (pada 20,30 kV) kepada 141,30 μ A (pada 30,05 kV) seiring penurunan resistansi permukaan daripada 262,106 M Ω kepada 212,668 M Ω . Perbedaan ini dipengaruhi oleh keadaan persekitaran dan kaedah pengujian. Kajian menyimpulkan bahawa walaupun keadaan lapangan semasa adalah selamat, akumulasi abu batubara pada keadaan lembap secara teoretikal meningkatkan risiko *dry band* dan kegagalan *Flashover*.

Kata Kunci: Abu Batubara, Arus Bocor, *Flashover*, Isolator Porselin *Outdoor*, Jaringan 20 kV.

ABSTRACT

The Effect of Coal Fly Ash Pollution on Leakage Current and Flashover Voltage of Outdoor Porcelain Insulators

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This study examines the effect of coal ash (fly ash) pollution on leakage current and Flashover risk in outdoor porcelain insulators. A true experimental research method was used through direct observation and leakage current measurement using a clamp meter on the grounding cable of a 20 kV distribution transformer at PT. BEST Tanjung Enim. Due to equipment limitations, the analysis of Flashover characteristics was supported by literature studies and secondary data comparison. Field testing results on May 11–13, 2026, showed a leakage current value of 0.0 A (0 μ A) with no signs of Flashover, indicating the insulator was still in good condition. Conversely, reference journal data based on laboratory tests showed an increase in leakage current from 83.30 μ A (at 20.30 kV) to 141.30 μ A (at 30.05 kV) along with a decrease in surface resistance from 262.106 M Ω to 212.668 M Ω . This discrepancy is influenced by environmental conditions and testing methods. The study concludes that while current field conditions are safe, the accumulation of coal ash under humid conditions theoretically increases the risk of dry band formation and Flashover failure.

Keywords: *Coal Ash, Leakage Current, Flashover, Outdoor Porcelain Insulator, 20 kV Grid.*