

## ABSTRAK

### **Analisis Kondisi Isolator pada *Current Limiting Reactor* Menggunakan Pengukuran UHF *Partial Discharge* dan *Thermal Infrared***

**(2026 : xv + 44 Halaman + Daftar Tabel + Daftar Gambar + Daftar Lampiran)**

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Penelitian ini dilatarbelakangi oleh pentingnya menjaga keandalan isolator tumpu *Current Limiting Reactor* (CLR) di PT X Kota Palembang dari risiko kegagalan isolasi. Tujuan penelitian adalah menganalisis kondisi kelayakan isolator melalui integrasi pengujian elektrik *Ultra High Frequency Partial Discharge* (UHF PD) dan pengujian termal *Thermal Infrared* berbasis metode perbandingan antar-fasa berbeban sama ( $T_{ref}$ ), serta menyusun matriks keputusan pemeliharaannya. Berdasarkan 220 data UHF PD, kondisi isolator didominasi kategori *Good* (77,73%), namun mendeteksi 14,54% kondisi *Bad* akibat kebocoran listrik internal. Sebaliknya, dari 164 data *Thermal Infrared*, populasi terpusat pada kategori *Moderate* (72,56%) akibat ketidakseimbangan panas permukaan luar. Perbedaan (*gap*) hasil ini membuktikan kedua alat memiliki fokus sensitivitas yang saling melengkapi. Integrasi kedua data ke dalam Matriks Keputusan Pemeliharaan Berbasis Kondisi (*Condition-Based Maintenance*) berhasil mengeliminasi titik buta (*blind spot*) penilaian risiko aset, serta menghasilkan empat skala prioritas rekomendasi tindakan praktis yang akurat untuk diimplementasikan di lapangan.

**Kata Kunci:** Isolator, UHF PD, *Thermal Infrared*, CLR, Sensitivitas.

## ***ABSTRACT***

### **Analisis Kondisi Isolator pada *Current Limiting Reactor* Menggunakan Pengukuran UHF *Partial Discharge* dan *Thermal Infrared***

**(2026 : xv + 44 Pages + List of Tables + List of Figures + List of Appendices)**

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*This research was initiated by the vital importance of maintaining the reliability of post insulators on Current Limiting Reactors (CLR) at PT X Palembang City against the risk of catastrophic insulation failure. The objective of this study was to analyze the operational condition of the insulators through the data integration of electrical Ultra High Frequency Partial Discharge (UHF PD) testing and thermal Thermal Infrared testing based on the phase-to-phase comparison method under identical load conditions ( $T_{ref}$ ), as well as to formulate its condition-based maintenance decision matrix. Based on 220 UHF PD data points, the insulator conditions were dominated by the "Good" category (77.73%), yet it successfully detected 14.54% of "Bad" conditions due to internal electrical leakage. Conversely, from 164 Thermal Infrared data points, the population was heavily concentrated in the "Moderate" category (72.56%) due to external surface thermal imbalances. This detection gap proves that both instruments possess distinct, complementary sensitivity focuses. Integrating both datasets into a Condition-Based Maintenance (CBM) Decision Matrix successfully eliminated the assessment blind spots of asset risks and provided four accurate, priority-scaled recommendations for practical field implementation.*

***Keywords: Insulator, UHF PD, Thermal Infrared, CLR, Sensitivity.***