

ABSTRAK

ANALISIS KONDISI ISOLATOR *CURRENT LIMITING REACTOR* BERDASARKAN CITRA *THERMAL INFRARED*

(2026 : xvii + 40 Halaman + Daftar Tabel + Daftar Gambar + Daftar Lampiran)

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Penelitian ini bertujuan menganalisis kondisi isolator *Current Limiting Reactor* di Perusahaan X menggunakan metode *Infrared Thermography* berdasarkan citra *thermal infrared*. Inspeksi dilakukan secara *online* tanpa menghentikan operasi peralatan sehingga proses pengamatan dapat berlangsung secara aman dan efisien. Sebanyak 32 citra *thermal infrared* digunakan sebagai data penelitian untuk mengevaluasi distribusi temperatur pada permukaan isolator. Analisis dilakukan berdasarkan titik pengukuran M1, M2, dan M3 yang merepresentasikan kondisi temperatur pada area pengamatan. Hasil penelitian menunjukkan bahwa distribusi temperatur pada permukaan isolator relatif merata dan tidak ditemukan peningkatan temperatur yang signifikan pada citra yang dianalisis. Kondisi tersebut mengindikasikan bahwa isolator *Current Limiting Reactor* masih berada dalam kondisi baik berdasarkan hasil inspeksi *thermal infrared*. Selain itu, metode *Infrared Thermography* terbukti mampu mendukung proses inspeksi yang cepat, aman, tanpa kontak langsung, serta dapat dijadikan sebagai dasar pelaksanaan pemeliharaan berbasis kondisi (*condition-based maintenance*) dan pemeliharaan prediktif (*predictive maintenance*) pada sistem tenaga listrik.

Kata Kunci: Isolator, CLR, *Infrared Thermography*, Temperatur, Pemeliharaan Prediktif

ABSTRACT
CONDITION ANALYSIS OF CURRENT LIMITING REACTOR INSULATORS
USING THERMAL INFRARED IMAGES

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This study aims to analyze the condition of the Current Limiting Reactor insulator at Company X using the Infrared Thermography method based on thermal infrared images. The inspection was conducted online without interrupting equipment operation, allowing the observation process to be carried out safely and efficiently. A total of 32 thermal infrared images were collected and analyzed to evaluate the temperature distribution on the insulator surface. The analysis was performed using measurement points M1, M2, and M3, which represent the observed temperature conditions. The results indicate that the temperature distribution across the insulator surface was relatively uniform, with no significant temperature rise detected in the analyzed images. These findings suggest that the Current Limiting Reactor insulator remains in good operating condition based on the thermal infrared inspection. Furthermore, the Infrared Thermography method proved to be an effective approach for conducting rapid, safe, and non-contact inspections, while also providing reliable information to support condition-based maintenance (CBM) and predictive maintenance (PdM) strategies in electrical power systems.

Keywords: Insulator, CLR, Infrared Thermography, Temperature, Predictive Maintenance