

ABSTRAK

Implementasi Adjustable Strain Carrier Yoke Untuk Pekerjaan Penggantian Isolator Tension Pada Jaringan SUTT 150 kV PLN
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Kegiatan penggantian isolator kerap menghadapi hambatan karena alat bantu *strain carrier* konvensional yang digunakan memiliki sifat kaku dan tidak fleksibel dalam mengikuti variasi kemiringan menara maupun rentang jarak antarisolator. Situasi ini mengakibatkan distribusi beban yang tidak merata, meningkatkan risiko kerusakan pada isolator, dan berdampak negatif terhadap aspek keselamatan dan produktivitas pekerjaan. Penelitian ini bertujuan untuk mengimplementasikan dan mengevaluasi kinerja *Adjustable Strain Carrier Yoke* (ASCY) sebagai alat bantu penggantian *isolator tension* pada jaringan SUTT 150 kV PLN. Metode penelitian yang digunakan adalah penelitian terapan dengan pendekatan eksperimental. Parameter pengujian meliputi kapasitas beban kerja, fleksibilitas penyesuaian sudut dan Panjang dan efisiensi waktu pekerjaan. Hasil implementasi menunjukkan bahwa *Adjustable Strain Carrier Yoke* mampu menahan beban kerja aman hingga 6 ton sesuai standar SPLN dan IEC, serta menghasilkan distribusi beban yang lebih seimbang pada konfigurasi *double conductor–double string isolator*. Penggunaan ASCY juga terbukti meningkatkan efisiensi waktu penggantian isolator dan menurunkan potensi kegagalan mekanis dibandingkan metode konvensional. Implikasi dari penelitian ini menunjukkan bahwa *Adjustable Strain Carrier Yoke* layak diterapkan sebagai peralatan bantu pemeliharaan pada jaringan SUTT 150 kV PLN karena mampu meningkatkan efisiensi operasional dan keandalan proses penggantian *isolator tension*. Hasil penelitian ini diharapkan dapat menjadi acuan teknis dalam penerapan alat serupa pada kegiatan pemeliharaan transmisi tegangan tinggi.

Kata kunci: *Adjustable Strain Carrier Yoke, Isolator Tension, SUTT 150 kV, Transmisi, Pemeliharaan*

ABSTRACT

*Implementation Adjustable Strain Carrier Yoke for Replacing Tension Insulators
on PLN's 150 kV SUTT Network
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Insulator replacement activities often encounter obstacles because the conventional strain carrier tools used are rigid and inflexible in following variations in tower inclination and inter-insulator distances. This situation results in uneven load distribution, increasing the risk of damage to insulators and negatively impacting the safety and productivity of the work. This study aims to implement and evaluate the performance of the Adjustable Strain Carrier Yoke (ASCY) as a tension insulator replacement tool on PLN's 150 kV SUTT network. The research method used is UPTIed research with an experimental UPTroach. The test parameters included working load capacity, angle and length adjustment flexibility, and work time efficiency. The implementation results showed that the Adjustable Strain Carrier Yoke was able to withstand a safe working load of up to 6 tons in accordance with SPLN and IEC standards, as well as produce a more balanced load distribution in a double conductor–double string insulator configuration. The use of ASCY has also been proven to increase the efficiency of insulator replacement time and reduce the potential for mechanical failure compared to conventional methods. The implications of this study indicate that the Adjustable Strain Carrier Yoke is suitable for use as maintenance equipment on PLN's 150 kV SUTT network because it can increase operational efficiency and the reliability of the tension insulator replacement process. The results of this study are expected to serve as a technical reference for the UPTlication of similar tools in high-voltage transmission maintenance activities.

Keywords: Adjustable Strain Carrier Yoke, Insulator Tension, SUTT 150 kV, Transmission, Maintenance.