

ABSTRAK

Perbaikan Resistansi Pentanahan Tower Transmisi Saluran Udara Tegangan Tinggi 150 Kv Jalur Poso-Sidera Dengan Metode Direct Grounding Dan Metode Multi Rod Grounding (Mrg)

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Resistansi pentanahan *tower* pada Saluran Udara Tegangan Tinggi (SUTT) 150 kV merupakan faktor krusial dalam menjamin keamanan peralatan dan keandalan sistem proteksi terhadap gangguan petir. Standar yang ditetapkan oleh PLN (Persero) mengharuskan nilai resistansi pentanahan *tower* tidak melebihi 10Ω . Penelitian ini bertujuan untuk menganalisis kondisi resistansi pentanahan eksisting pada *tower* SUTT 150 kV jalur Poso-Sidera yang memiliki nilai tinggi, serta membandingkan efektivitas dua metode perbaikan: Metode *Direct Grounding* dan Metode *Multi Rod Grounding* (MRG). Metode penelitian yang digunakan adalah studi kasus kuantitatif dan komparatif. Data awal resistansi tanah dan resistivitas tanah diukur menggunakan metode *Wenner Four-Point*. Perbaikan kemudian diimplementasikan menggunakan: 1) Penambahan batang elektroda (*Direct Grounding*) dan 2) Penggunaan beberapa batang elektroda yang dihubungkan paralel (*Multi Rod Grounding*). Hasil analisis akan membandingkan penurunan resistansi yang dicapai oleh kedua metode tersebut, efisiensi biaya, dan kepatuhan terhadap standar $\leq 10\Omega$. Penelitian ini diharapkan memberikan rekomendasi teknis yang paling efektif dan efisien untuk perbaikan pentanahan *tower* SUTT di lokasi dengan resistivitas tanah yang tinggi, khususnya di jalur Poso-Sidera.

Kata Kunci: SUTT 150 kV, Resistansi Pentanahan, *Tower* Transmisi, *Direct Grounding*, *Multi Rod Grounding*, Resistivitas Tanah.

ABSTRACT

Improvement Of Tower Transmission Earthing Resistance On The 150 Kv Overhead High Voltage Transmission Line Poso-Sidera Using Direct Grounding Method And Multi Rod Grounding (Mrg) Method

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The earthing resistance of transmission towers on the 150 kV Overhead High Voltage Transmission Line (SUTT) is a crucial factor in ensuring equipment safety and the reliability of the protection system against lightning strikes. The standard set by PLN (Persero) mandates that the tower earthing resistance value must not exceed 10Ω . This study aims to analyze the condition of the existing earthing resistance on the SUTT 150 kV Poso-Sidera line towers that show high values, and to compare the effectiveness of two improvement methods: The *Direct Grounding Method* and the *Multi Rod Grounding (MRG) Method*. The research method employed is a quantitative and comparative case study. Initial soil resistance and soil resistivity data are measured using the Wenner Four-Point method. Improvements are then implemented using: 1) The addition of a single ground rod (*Direct Grounding*) and 2) The use of multiple ground rods connected in parallel (*Multi Rod Grounding*). The results of the analysis will compare the reduction in resistance achieved by both methods, cost efficiency, and compliance with the $\leq 10\Omega$ standard. This research is expected to provide the most technically effective and cost-efficient recommendations for improving SUTT tower earthing in locations with high soil resistivity, specifically along the Poso-Sidera line.

Keywords: 150 kV SUTT, Earthing Resistance, Transmission Tower, Direct Grounding, Multi Rod Grounding, Soil Resistivity.