

ABSTRAK

ADE HENDRIAWAN

Kajian Fungsi Grounding Pada Generator

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Penelitian ini dilatarbelakangi oleh pentingnya sistem grounding sebagai bagian dari sistem proteksi pada instalasi tenaga listrik, khususnya pada generator di PLTD Selatpanjang. Hasil pengamatan awal menunjukkan bahwa nilai tahanan pentanahan beberapa unit generator berada di atas standar yang ditetapkan PUIL 2011 ($\leq 5 \Omega$), yaitu berkisar antara 6,8 Ω hingga 9,2 Ω . Metode penelitian yang digunakan adalah deskriptif kuantitatif dengan teknik pengumpulan data melalui observasi lapangan, pengukuran menggunakan *earth tester* metode tiga titik, dokumentasi, dan wawancara teknis. Data yang diperoleh berupa nilai tahanan pentanahan, tegangan, dan arus kemudian dianalisis dan dibandingkan dengan standar PUIL 2011 dan IEEE Std 142-2007. Sampel penelitian difokuskan pada satu unit generator sinkron tiga fasa berkapasitas 100–250 kVA dengan sistem grounding elektroda tunggal. Hasil pengukuran nilai tahanan pentanahan pada sistem grounding generator menunjukkan nilai rata-rata sebesar 2,75 Ω , 1,88 Ω , dan 0,89 Ω . Nilai tersebut berada di bawah batas maksimum yang ditetapkan oleh standar PUIL 2011 dan IEEE Std 142-2007, yaitu $\leq 5 \Omega$, sehingga dapat disimpulkan bahwa sistem grounding generator telah memenuhi standar keselamatan kelistrikan. Kesesuaian ini menunjukkan bahwa sistem *grounding* generator di PLTD Lasikin telah dirancang dan dipelihara dengan cukup baik dari sisi keselamatan instalasi. Nilai tahanan yang rendah memungkinkan sistem proteksi bekerja secara efektif, baik dalam mendeteksi maupun memutus gangguan, sehingga risiko kerusakan peralatan dan bahaya bagi operator dapat diminimalkan.

Kata kunci: grounding, generator, tahanan pentanahan, PLTD, kestabilan tegangan.

ABSTRACT

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Study of the Grounding Function in Generators

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This study was motivated by the major role of lightning and its influence to grounding system as part of protection in electrical power installations, particularly in generators at Lasikin Diesel Power Plant. From the preliminary result, it can be seen that the grounding resistances of several generator unit are relatively higher than PUIL 2011 ($\leq 5 \Omega$) requirements that in between of 6.8 to 9.2 ohm. The research method used is descriptive quantitative with data collection techniques through field observations, measurements using a three-point earth tester method, documentation, and technician interviews. The data obtained in the form of grounding resistance values, voltage, and current are then analyzed and compared with the PUIL 2011 standard and IEEE Std 142-2007. The research sample focused on one three-phase synchronous generator unit with a capacity of 100–250 kVA with a single electrode grounding system. The results of grounding resistance measurements on the generator grounding system showed average values of 2.75 Ω , 1.88 Ω , and 0.89 Ω . These values are below the maximum limit set by the 2011 PUIL standard and IEEE Std 142-2007, which is $\leq 5 \Omega$. Therefore, it can be concluded that the generator grounding system meets electrical safety standards. This compliance indicates that the generator grounding system at the Lasikin Diesel Power Plant has been adequately designed and maintained from a safety standpoint. The low resistance value allows the protection system to work effectively, both in detecting and interrupting faults, thus minimizing the risk of equipment damage and hazards to operators.

Keywords: *grounding, generator, grounding resistance, Diesel Power Plant, voltage stability.*