

ABSTRAK

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Program Studi : Teknik Elektro
Judul : Analisis Pengaruh Pelapisan Minyak Silikon terhadap Tegangan *Flashover* pada Isolator Porselen Kondisi Terkontaminasi Garam

Isolator adalah komponen penting dalam sistem distribusi energi listrik yang berfungsi sebagai pemisah antara konduktor dengan tiang penyangga. Namun, kinerjanya dapat menurun akibat terkontaminasi polutan, salah satunya polutan garam. Penelitian ini bertujuan untuk mengetahui pengaruh pelapisan minyak silikon terhadap nilai tegangan flashover pada isolator porselen dalam kondisi bersih dan terkontaminasi garam, baik dalam keadaan kering maupun basah. Pengujian dilakukan menggunakan metode *slow rate of rise test* pada isolator porselen dengan variasi kondisi (bersih dan terkontaminasi garam 5%, 15%, 20%), keadaan (kering dan basah), serta pelapisan minyak silikon dengan variasi viskositas (100cps, 350cps, 1000cps, 2500cps). Hasil menunjukkan bahwa pada kondisi tanpa pelapis, tegangan flashover menurun signifikan seiring meningkatnya konsentrasi garam, khususnya pada kondisi basah. Pelapisan minyak silikon terbukti efektif meningkatkan tegangan flashover, terutama pada isolator yang terkontaminasi. Semakin tinggi viskositas minyak silikon, semakin besar peningkatan yang diperoleh, itu karena sifat hidrofobik minyak silikon mampu mencegah penyebaran air berpolutan dan pembentukan jalur konduktif di permukaan isolator. Dengan demikian, pelapisan minyak silikon, khususnya dengan viskositas tinggi, dapat menjadi solusi protektif untuk menjaga keandalan isolator di lingkungan lembap dan tercemar.

Kata Kunci: isolator porselen, minyak silikon, tegangan *flashover*, kontaminasi garam, hidrofobik

ABSTRACT

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Title : *Analysis of Silicone Oil Coating Effects on the Flashover Voltage of Porcelain Insulators under Salt Contamination*

Insulators are essential components in electrical power distribution systems that function as separators between conductors and supporting structures. However, their performance can deteriorate due to contamination by pollutants, one of which is salt. This study aims to determine the effect of silicone oil coating on the flashover voltage of porcelain insulators under clean and salt contaminated conditions, both in dry and wet states. The testing was carried out using the slow rate of rise test method on porcelain insulators with variations in conditions (clean and salt contaminated at 5%, 15%, and 20%), surface states (dry and wet), and silicone oil coatings with different viscosities (100 cps, 350 cps, 1000 cps, and 2500 cps). The results show that under uncoated conditions, the flashover voltage decreases significantly as the salt concentration increases, particularly under wet conditions. The silicone oil coating proved effective in increasing flashover voltage, especially on contaminated insulators. Higher silicone oil viscosity resulted in greater improvement, as the hydrophobic nature of silicone oil helps prevent the spread of polluted water and the formation of conductive paths on the insulator surface. Therefore, silicone oil coating, particularly with high viscosity, can serve as a protective solution to maintain the reliability of insulators in humid and polluted environments.

Keywords: porcelain insulator, silicone oil, flashover voltage, salt contamination, hydrophobicity.