

ABSTRAK

**PENGUKURAN TAHANAN ISOLASI KABEL BAWAH TANAH
NA2XSEFGBY 6,6 KV UNTUK MENGETAHUI GANGGUAN FASA KE
TANAH**

(2026 : xv + 54 halaman + Daftar Pustaka + Lampiran)

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Sistem distribusi tegangan menengah 6,6 kV menggunakan kabel bawah tanah tipe NA2XSEFGBY berisolasi XLPE banyak digunakan pada instalasi industri karena keandalannya, namun tetap rentan terhadap gangguan fasa ke tanah akibat degradasi isolasi pada area sambungan kabel. Laporan ini bertujuan mengukur nilai tahanan isolasi, menganalisis karakteristik grafik, serta menentukan jarak titik gangguan pada kabel dari ST 21 ke sambungan *overhead*, berlandaskan standar IEEE Std 400 dan metode *Arc Reflection Method*. Pengujian tahanan isolasi menggunakan Fluke 1550C pada tegangan uji DC 10.000 V menunjukkan fasa R hanya mencatat 0,04 M Ω (0,61% dari nilai minimum 6,6 M Ω), sementara fasa S dan T masing-masing 111 M Ω dan 215 M Ω , keduanya memenuhi syarat. Megger STX40 berbasis ARM mengidentifikasi lonjakan amplitudo negatif signifikan pada ± 830 m, dikonfirmasi perhitungan manual sebesar 829,84 m dengan deviasi hanya 0,019%. Fasa R mengalami kegagalan isolasi total pada sambungan kabel di jarak ± 830 meter dari ST 21, disebabkan oleh usia sambungan ± 19 tahun yang diperparah peningkatan beban sistem. Fasa S dan T dinyatakan laik beroperasi. Penggantian sambungan pada area tersebut sangat direkomendasikan disertai inspeksi menyeluruh terhadap sambungan lain yang terpasang pada periode yang sama.

Kata Kunci: Kabel Bawah Tanah, NA2XSEFGBY, Tahanan Isolasi, Gangguan Fasa ke Tanah, *Fault Locator*.

ABSTRACT

MEASURING THE INSULATION RESISTANCE OF NA2XSEFGBY 6.6 KV UNDERGROUND CABLE TO DETERMINE PHASE-TO-GROUND FAULTS

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The 6.6 kV medium voltage underground cable system using NA2XSEFGBY XLPE-insulated cable is widely used in industrial distribution due to its reliability, yet remains susceptible to phase-to-ground faults from insulation degradation at cable joints. This report aims to measure insulation resistance, analyze fault locator graph characteristics, and determine the fault location on the cable from ST 21 to the overhead connection, based on IEEE Std 400 standards and the Arc Reflection Method (ARM). Insulation resistance testing using the Fluke 1550C at 10,000 V DC revealed that phase R recorded only 0.04 M Ω (0.61% of the 6.6 M Ω minimum), while phases S and T measured 111 M Ω and 215 M Ω respectively. The Megger STX40 ARM fault locator identified a significant negative amplitude spike at ± 830 m, confirmed by manual calculation at 829.84 m with only 0.019% deviation. Phase R experienced total insulation failure at the cable joint ± 830 meters from ST 21, caused by approximately 19 years of joint aging compounded by gradual load increase. Joint replacement at that location is strongly recommended along with inspection of other joints from the same installation period.

Keywords: *Underground Cable, NA2XSEFGBY, Insulation Resistance, Phase-to-Ground Fault, Fault Locator.*