ABSTRAK

Sebagaimana diketahui, kehidupan modern seperti saat ini memiliki ketergantungan yang sangat tinggi terhadap ketersediaan energi listrik. Oleh karena itulah, permintaan terhadap energi listrik semakin hari akan semakin meningkat. Namun demikian, perlu disadari bahwa selain bermanfaat bagi kehidupan, tenaga listrik juga memiliki potensi bahaya terhadap keselamatan apabila salah dalam penanganan dan pemanfaatannya. Masih sering terjadi kebakaran yang diduga diakibatkan oleh arus bocor atau arus hubung pendek listrik atau kecelakaan akibat terkena/tersentuh arus listrik yang menyebabkan luka bahkan korban jiwa. Dalam upaya mewujudkan kondisi andal dan aman bagi instalasi, aman dari bahaya terhadap manusia dan makhluk hidup lain, serta ramah bagi lingkungan, diperlukan sistem kelistrikan dengan sistem pengaman *(protection system)* yang sangat baik dan benar yang memenuhi kaidah-kaidah instalasi tenaga listrik sesuai dengan ketentuan. Salah satu sistem pengaman yang dapat digunakan untuk mencegah hal-hal yang tidak diinginkan adalah dengan pemasangan sistem proteksi pentanahan pada seluruh peralatan yang bertegangan. Setelah dilakukan pemasangan sistem proteksi pentanahan dilakukan pengukuran tahanan pentanahan untuk mengetahui apakah nilai pengukuran tahanan pentanahan sudah sesuai standar atau belum.

Pada Tugas Akhir ini, telah dilakukan pengukuran tahanan tanah, tahanan jenis tanah, dan tahanan pentanahan pada body trafo, netral trafo, dan body kubikel instalasi pemanfaatan tegangan menengah di perusahaan area bekasi. Pengukuran ini dilakukan dengan menggunakan alat ukur *Digital Earth Tester* dan *Soil Resistivity Tester*.

Setelah dilakukan pengukuran tahanan tanah pada 3 titik (body trafo, netral trafo, dan body kubikel) didapatkan hasil 37 Ω, 37 Ω, 36 Ω di PT. Focus Color Indonesia, 39 Ω, 39 Ω, 35 Ω di PT. Misumi Indonesia, 36 Ω, 35 Ω, 37 Ω di PT. Indonesia Steel Tube Works, 37 Ω, 37 Ω, 36 Ω di PT. RBFood Manufaktur Indonesia, dan 35 Ω, 35 Ω, 38 Ω di PT. Trimitra Indoplast Mandiri. Dengan menggunakan persamaan $\rho = 2\ \pi\ a\ Rt$ akan didapatkan nilai tahanan jenis tanah 232.36 Ω, 232.36 Ω, 226.08 Ω di PT. Focus Color Indonesia, 244.92 Ω, 244.92 Ω, 219.8 Ω di PT. Misumi Indonesia, 226.08 Ω, 219.8 Ω, 232.36 Ω di PT. Indonesia Steel Tube Works, 232.36 Ω, 232.36 Ω, 226.08 Ω di PT. RBFood Manufaktur Indonesia, dan 219.8 Ω, 219.8 Ω, 238.64 Ω di PT. Trimitra Indoplast Mandiri. pengukuran tahanan pentanahan pada 3 titik (bodi trafo, netral trafo, dan bodi kubikel) didapatkan hasil 0.29 Ω, 0.28 Ω, 0.22 Ω di PT. Focus Color Indonesia, 0.85 Ω, 0.82 Ω, 0.15 Ω di PT. Misumi Indonesia, 0.21 Ω, 0.19 Ω, 0.28 Ω di PT. Indonesia Steel Tube Works, 0.37 Ω, 0.33 Ω, 0.25 Ω di PT. RBFood Manufaktur Indonesia, dan 0.15 Ω, 0.14 Ω, 0.49 Ω di PT. Trimitra Indoplast Mandiri.

Kata Kunci : Tahanan pentanahan, Tahanan tanah, Tahanan jenis tanah, *Digital Earth Tester, Soil Resistivity Tester*.

ABSTRACT

As is known, modern life like today has a very high dependence on the availability of electrical energy. Therefore, the demand for electrical energy will increasingly increase. However, it is important to realize that in addition to being beneficial to life, electric power also has the potential for safety hazards if mistakenly handled and utilized. There are still frequent fires that are suspected to be caused by leakage currents or short-circuit currents or accidents due to being exposed / touched by electric current which causes injuries and even fatalities. In an effort to create reliable and safe conditions for the installation, safe from danger to humans and other living creatures, as well as friendly to the environment, an electrical system with a safety system is very good and true that meets the rules of electricity installation in accordance with provisions. One of the safety systems that can be used to prevent things that are not desirable is to install a ground protection system on all voltage equipment. After the installation of the earth protection system is measured, the earth resistance is measured to determine whether or not the earth resistance measurement value is up to standard.

In this Final Project, measurements have been carried out on soil resistance, soil type resistance, and earth resistance on transformer body, transformer neutral, and cubicle body of medium voltage utilization installations in company area of bekasi. This measurement is carried out using a Digital Earth Tester and Soil Resistivity Tester.

After measuring soil resistance at 3 points (transformer body, transformer neutral, and cubicle body) 37 37, 37 Ω, 36 hasil results at PT. Focus Color Indonesia, 39 ", 39", 35 "at PT. Misumi Indonesia, 36 Ω, 35 Ω, 37 Ω at PT. Indonesia Steel Tube Works, 37 ", 37", 36 "at PT. RBFood Manufaktur Indonesia, and 35 Ω, 35 Ω, 38 Ω at PT. Trimitra Indoplast Mandiri. By using the equation $\rho = 2 \pi a Rt$ the soil resistance value of 232.36 Ω, 232.36 Ω, 226.08 Ω will be obtained at PT. Focus Color Indonesia, 244.92 Ω, 244.92 Ω, 219.8 Ω at PT. Misumi Indonesia, 226.08 Ω, 219.8 Ω, 232.36 Ω at PT. Indonesia Steel Tube Works, 232.36 Ω, 232.36 Ω, 226.08 Ω at PT. RBFood Manufaktur Indonesia, and 219.8 Ω, 219.8 Ω, 238.64 Ω at PT. Trimitra Indoplast Mandiri. measurement of ground resistance at 3 points (transformer body, transformer neutral, and cubicle body) results are 0.29 Ω, 0.28 Ω, 0.22 Ω in PT. Focus Color Indonesia, 0.85 Ω, 0.82 Ω, 0.15 Ω at PT. Misumi Indonesia, 0.21 Ω, 0.19 Ω, 0.28 Ω at PT. Indonesia Steel Tube Works, 0.37 Ω, 0.33 Ω, 0.25 Ω at PT. RBFood Manufaktur Indonesia, and 0.15 Ω, 0.14 Ω, 0.49 Ω at PT. Trimitra Indoplast Mandiri.

Keywords: Earth resistance, Soil resistance, Soil type resistance, Digital Earth Tester, Soil Resistivity Tester.