ABSTRAK

Dengan dibangunnya GIS Padalarang Baru II akan ada penambahan dan perubahan konfigurasi sistem transmisi baru yang dapat mengakibatkan terjadinya kesalahan kinerja sistem proteksi. *Distance relay* sebagai proteksi saluran transmisi memerlukan tahapan perencanaan untuk memperoleh nilai *setting* yang tepat. Penelitian ini diperlukan sebagai tahapan perencanaan nilai *setting distance relay* karakteristik mho dengan memperhatikan fenomena *infeed current* menggunakan aplikasi yang dirancang. Perancangan dimulai dengan merancang metode analisis perhitungan yang terdiri dari beberapa metode meliputi perhitungan impedansi saluran, perhitungan impedansi trafo, perhitungan *ratio* CT & PT, perhitungan *setting* zona proteksi,perhitungan Z *apparents* dan perhitungan grafik karakteristik. Kemudian membuat usulan *use case diagram, activity diagram,* GUI dan mengimplementasikannya menggunakan aplikasi MATLAB. Setelah itu dilakukan pengujian terhadap tampilan aplikasi, nilai pengolahan data dan simulasi gangguan hubung singkat menggunakan aplikasi DIgSILENT. Dari hasil pengujian tersebut didapat nilai *setting distance relay* yang tepat pada GIS Padalarang Baru II-GI Padalarang adalah: Z1Primer = 6,2498∠81,8404° Ω, Z1Sekunder = 1,6668∠81,8404° Ω, Z2Primer = 19,3763∠81,8404°Ω, Z2Sekunder = 5,1677∠81,8404° Ω, Z3Primer = 29,5030∠81,8404° Ω, Z3Sekunder = 7,8684∠81,8404° Ω. Nilai *setting distance relay* pada GI Padalarang-GIS Padalarang Baru II adalah: Z1Primer = 6,2498∠81,8404° Ω, Z1Sekunder = 1,6668∠81,8404° Ω, Z2Primer = 9,3747∠81,8402° Ω, Z2Sekunder = 2,5002∠81,8394° Ω. *Distance relay* karakteristik mho akan bekerja apabila impedansi yang terukur berada didalam lingkaran setelan jangkauan. Pembacaan impedansi yang sebenarnya dibaca oleh *relay* dipengaruhi oleh faktor *infeed current* sehingga perlu adanya *resetting* zona 2 *distance relay* GIS Padalarang Baru II-GI Padalarang. Sedangkan untuk koordinasi *setting distance relay* yang ada sudah mampu bekerja dalam melindungi setiap zona proteksi dan menjadi *backup* bagi *distance relay* lainnya apabila terjadi kegagalan kinerja.

Kata kunci: *Distance Relay*, GUI, Gangguan Hubung Singkat, *Infeed Current*, Saluran Transmisi

ABSTRACT

With the construction of the Padalarang Baru II GIS, there will be additions and changes to the configuration of the new transmission system which can result in errors in the performance of the protection system. Distance relay as transmission line protection requires a planning stage to obtain the correct setting value. This research is needed as a planning stage of the setting value of the distance relay characteristic of mho by paying attention to the infeed current phenomenon using the designed application. The design begins with designing an analytical calculation method which consists of several methods including line impedance calculations, transformer impedance calculations, CT & PT ratio calculations, protection zone setting calculations, Z apparents calculations and characteristic graph calculations. Then make a proposed use case diagram, activity diagram, GUI and implement it using the MATLAB application. After that, tests were carried out on the application display, data processing values and short circuit fault simulation using the DIgSILENT application. From the test results, the correct distance relay setting values for GIS Padalarang Baru II-GI Padalarang are: Z1Primer = 6.2498∠81.8404° Ω, Z1Secondary = 1.6668∠81.8404° Ω, Z2Primer = 19.3763 ∠81.8404°Ω, Z2Secondary = 5.1677∠81.8404° Ω, Z3Primer = 29.5030∠81.8404° Ω, Z3Secondary = 7.8684∠81.8404° Ω. The value of the distance relay setting at GI Padalarang-GIS Padalarang Baru II is: Z1Primer = 6.2498∠81.8404° Ω, Z1Secondary = 1.6668∠81.8404° Ω, Z2Primer = 9.3747∠81.8402° Ω, Z2Secondary = 2.5002∠81.8394° Ω. The mho characteristic distance relay will work if the measured impedance is within the range setting circle. The impedance reading that is actually read by the relay is influenced by the infeed current factor so it is necessary to reset zone 2 of the GIS Padalarang Baru II-GI Padalarang distance relay. As for the coordination of the existing distance relay settings, they are able to work in protecting each protection zone and become a backup for other distance relays in the event of a performance failure.

Keywords: Distance Relay, ,GUI, Short Circuit Fault, Infeed Current, Transmission Line