

ABSTRAK

Rebecca Friskila Lumban Gaol : Analisis Setting Rele Jarak pada Gangguan Hubung Singkat 1 Fasa ke Tanah di Penghantar 150 kV Gardu Induk Paya Pasir. Skripsi. Fakultas Teknik. Universitas Negeri Medan. 2022

Penelitian dilaksanakan untuk menganalisis setting rele jarak pada gangguan hubung singkat 1 fasa ke tanah di Penghantar 150 kV Gardu Induk Paya Pasir. Sistem proteksi digunakan untuk melindungi dan mengamankan peralatan listrik dari gangguan supaya tidak mengalami kerusakan. Rele jarak merupakan salah satu sistem proteksi di transmisi sehingga diharapkan rele jarak dapat bekerja dengan selektif dan handal dengan tujuan meminimalisir terjadinya gangguan listrik. Rele jarak bekerja dengan membandingkan impedansi gangguan dengan impedansi settingan dimana impedansi gangguan harus lebih kecil dari impedansi settingan sehingga rele jarak dapat bekerja. Salah satu gangguan yang ada di transmisi adalah gangguan hubung singkat 1 fasa ke tanah.

Metode yang digunakan penelitian ini adalah kuantitatif dimana penulis melakukan pengumpulan data di lapangan setelah itu dilakukan analisis perbandingan dengan standar rele jarak PLN.

Oleh karena itu, perlunya dilakukan analisis maka di dapat hasilnya $I_{1 \text{ fasa ke tanah}} = 6.307,966\text{-}j1.646,064 \text{ A}$ Gardu Induk Paya Pasir- Gardu Induk Paya Geli dan $I_{1 \text{ fasa ke tanah}} = 6.388,093\text{-}j1.532,837 \text{ A}$ Gardu Induk Paya Geli- Gardu Induk Binjai. Impedansi setting rele jarak zona 1 = $5,222 \angle 78.175$, zona 2 = $7,833 \angle 78.176$ dan zona 3 = $9,746 \angle 78.177$.

Kata kunci : Saluran transmisi, system proteksi, rele jarak, gangguan hubung singkat 1 fasa ke tanag, zona proteksi

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ABSTRACT

Rebecca Friskila Lumban Gaol: Analysis of Distance Relay Settings on 1 Phase to Ground Short Circuit Fault at 150 kV Conductor Paya Pasir Substation. Thesis. Faculty of Engineering. Medan State University. 2022

The research was carried out to analyze the distance relay settings on a single phase short circuit to ground fault at the 150 kV conductor at the Paya Pasir Substation. The protection system is used to protect and secure electrical equipment from interference so as not to be damaged. The distance relay is one of the protection systems in the transmission so that it is expected that the distance relay can work selectively and reliably with the aim of minimizing the occurrence of electrical disturbances. The distance relay works by comparing the fault impedance with the setting impedance where the fault impedance must be smaller than the setting impedance so that the distance relay can work. One of the disturbances in the transmission is a single phase short circuit to ground.

The method used in this research is quantitative where the author collects data in the field after which a comparative analysis is carried out with the PLN distance relay standard.

Therefore, it is necessary to carry out an analysis so that the results are I 1 phase to ground = 6,307,966-j1,646,064 A Paya Pasir Substation - Paya Geli Substation and I 1 phase to ground = 6,388,093-j1,532,837 A Substation Parent Paya Geli- Binjai Substation. Impedance setting distance relay zone 1 = 5.222 78.175, zone 2 = 7.833 78.176 and zone 3 = 9.746 78.177.

Keywords : Transmission line, protection system, distance relay, fault line short 1 phase to ground, protection zone

