RINGKASAN

ANALISIS KOORDINASI DAN KINERJA *DIRECTIONAL OVER CURRENT RELAY* PADA PENGHANTAR 30 KV KALIBAKAL - KETENGER GI KALIBAKAL

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Sistem proteksi pada penghantar merupakan sistem pengamanan listrik yang membatasi jika terjadi gangguan di zona proteksi suatu penghantar agar mengurangi kerusakan di daerah yang terganggu. Bagian komponen yang paling sering terkena gangguan ada pada kawat transmisi (70% s.d. 80% dari seluruh gangguan). Dalam sistem proteksi penghantar, gangguan dapat diproteksi dengan beberapa relai, salah satunya *DOCR* (*Directional Overcurrent Relay*) untuk proteksi cadangan. Relai *DOCR* bekerja secara selektif mengamankan saluran transmisi dari gangguan eksternal dan internal. Relai *DOCR* digunakan untuk mengamankan gangguan arus hubung singkat yang terjadi di jalur penghantar dengan pemutusan yang selektif yang dapat membuat sistem menjadi lebih stabil. Relai *DOCR* bekerja saat mendeteksi arus lebih pada arah tertentu sehingga memproteksi peraltan listrik di zona proteksinya. Diperlukan pengumpulan data terkait spesifikasi generator, spesifikasi transformator, spesifikasi *CT*, spesifikasi *PT*, data *setting DOCR*, dan laporan gangguan pada penghantar. Selanjutnya dilakukan perhitungan matematis dan simulasi pada *software ETAP 12.6.0*. Hasil simulasi data aktual dilapangan dan hasil simulasi perhitungan matematis akan dibandingkan untuk mengetahui keandalan relai. Secara khusus penelitian ini membahas analisis gangguan hubung singkat pada penghantar yang diproteksi menggunakan relai *DOCR* berdasarkan standar IEEE.

Kata kunci : sistem proteksi, relai *DOCR*, ETAP

SUMMARY

COORDINATION AND PERFORMANCE ANALYSIS OF DIRECTIONAL OVER CURRENT RELAY ON 30 KV KALIBAKAL – KETENGER TRANSMISSION KALIBAKAL SUBSTATION

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The protection system on the conductor is an electrical security system that limits if there is a disturbance in the protection zone of a conductor in order to reduce damage in the disturbed area. The component parts that are most often affected by interference are in the transmission wire (70% to 80% of all disturbances). In the conductor protection system, disturbances can be protected by several relays, one of which is DOCR (Directional Overcurrent Relay) for backup protection. The DOCR relay works by selectively securing the transmission line from external and internal interference. The DOCR relay is used to protect the short-circuit current that occurs in the conductor line by selective termination which can make the system more stable. The DOCR relay works when it detects an overcurrent in a certain direction, thus protecting electrical equipment in its protection zone. It is necessary to collect data related to generator specifications, transformer specifications, CT specifications, PT specifications, DOCR setting data, and fault reports on conductors. Furthermore, mathematical calculations and simulations are carried out on the ETAP 12.6.0 software. The simulation results of the actual data in the field and the simulation results of mathematical calculations will be compared to determine the reliability of the relay. In particular, this study discusses the analysis of short circuit faults in conductors that are protected using a DOCR relay based on the IEEE standard.

Keywords : protection system, DOCR relay, ETAP.