

ABSTRAK

OPTIMALISASI RELAY OCR DAN GFR PADA SISTEM INTERKONEKSI ANTARA TRAF0 II GI LIWA 20 KV PLN DAN PLTMH BATU BRAK UNTUK MEMINIMALISIR TERJADINYA SYMPATHETIC TRIP

Oleh

RIDHO WIDODO

Peningkatan kebutuhan energi listrik nasional mendorong pemanfaatan sumber energi terbarukan, salah satunya melalui Pembangkit Listrik Tenaga Mikrohidro (PLTMH). Jaringan sistem interkoneksi antara PLTMH Batu Brak dan Gardu Induk (GI) Liwa 20 kV PLN sering terjadi gangguan berupa sympathetic trip. Gangguan ini menyebabkan pemutus tenaga (PMT) pada penyulang yang tidak terganggu ikut terputus. Hasil analisis menunjukkan bahwa perlunya pengaturan ulang (re-setting) OCR, GFR, dan penambahan relay arus arah. Untuk setting OCR pada penyulang trafo II GI liwa Iset = 294A tms = 0,275, penyulang trafo PLTMH Batu Braak Iset = 192A tms = 0,2, pada penyulang americano Iset = 162A tms = 0,125, penyulang capucino Iset = 84A tms = 0,15, dan penyulang latte Iset = 48A tms = 0,125. Sedangkan pengaturan ulang setting GFR pada penyulang trafo II GI liwa Iset = 757,90A tms = 0,12, penyulang trafo PLTMH Batu Brak Iset = 293,60A tms = 1,075, penyulang Americano Iset = 47,60A tms = 0,75, penyulang capucino Iset = 199,73A tms = 0,1, dan penyulang latte Iset = 85,54A tms = 0,875. Pengaturan ulang OCR dan GFR digunakan untuk pembaruan sistem koordinasi proteksi dengan adanya penambahan pembangkit PLTMH Batu brak dan perkembangan beban sekarang. Sedangkan perlunya relay arus arah dengan setting *forward bias*, dimana relay hanya akan bekerja ketika ada arus gangguan yang mengalir dari sumber menuju beban sehingga sympathetic trip dapat dihindari dan sistem interkoneksi dapat bekerja lebih selektif dan andal.

Kata kunci: Sympathetic Trip, Sistem Interkoneksi, OCR, GFR, Relay Arus Arah.

ABSTRACT**OPTIMIZATION OF OCR AND GFR RELAYS IN THE
INTERCONNECTION SYSTEM BETWEEN TRANSFORMER II GI
LIWA 20 KV PLN AND PLTMH BATU BRAK TO MINIMIZE
SYMPATHETIC TRIP OCCURRENCE****By****RIDHO WIDODO**

The increase in national electricity demand has encouraged the use of renewable energy sources, one of which is micro-hydro power plants (PLTMH). The interconnection system network between the PLTMH Batu Brak and the Liwa 20 kV PLN substation frequently experiences sympathetic trip disturbances. These disturbances result in the tripping of the circuit breaker (CB) on the unaffected feeder. The analysis results indicate the necessity of resetting the OCR and GFR, as well as the incorporation of directional current relays. The OCR settings for the GI Liwa transformer II feeder are as follows: $I_{set} = 294A$ tms = 0.275. For the PLTMH Batu Brak transformer feeder, $I_{set} = 192A$ tms = 0.2. TheAmericano feeder has an I_{set} of 162A tms = 0.125, the Capucino feeder has an I_{set} of 84A tms = 0.15, and the latte feeder has an I_{set} of 48A tms = 0.125. Meanwhile, the GFR setting was reset on the GI Liwa transformer II feeder at a setting of 757.90A tms = 0.12, the PLTMH Batu Brak transformer feeder at a setting of 293.60A tms = 1.075, theAmericano feeder at a setting of 47.60A tms = 0.75, the Capucino feeder at a setting of 199.73A and tms = 0.1, and the Latte feeder at a setting of 85.54A and tms = 0.875. The OCR and GFR resets are utilized to facilitate the update of the protection coordination system, a process necessitated by the incorporation of the Batu Brak micro-hydro power plant and the current load developments. Concurrently, directional current relays with forward bias settings are required. These relays are designed to operate exclusively in the event of a fault current flowing from the source to the load. This configuration facilitates the prevention of sympathetic tripping, thereby ensuring the selective and reliable operation of the interconnection system.

keywords: Sympathetic Trip, Interconnection System, OCR, GFR, Directional Current Relay.