

INTISARI

Analisis Studi dan Evaluasi Koordinasi Sistem Peralatan Proteksi pada Switchgear 19 kV Pembangkit Listrik Tenaga Panas Bumi Unit 1 PT Geo Dipa Energi (Persero) Unit Dieng

Haidar Nabil Muflih

19/447060/SV/16779

Pada pembangkit listrik tenaga panas bumi (PLTP) PT. Geo Dipa Energi (Persero) Unit Dieng, sistem proteksi kelistrikan dibutuhkan dalam menjaga keandalan dan kontinuitas pembangkit untuk menyalurkan listrik dalam sistem interkoneksi Jawa, Madura, dan Bali. Setiap peralatan pada sistem proteksi memiliki *setting* dan waktu kerja masing-masing menyesuaikan daerah yang diproteksi dan gangguan yang terjadi. Penelitian ini membahas tentang analisis studi dan evaluasi koordinasi proteksi pada *switchgear* 19 KV PLTP Unit 1 PT. Geo Dipa Energi (Persero) Unit Dieng. Analisis studi dilakukan dengan melakukan perhitungan *setting* dan simulasi hubung singkat pada kondisi *existing* berdasarkan data hasil pengujian. Tujuan analisis studi adalah untuk memastikan kesesuaian *setting existing* dengan standar dan prinsip koordinasi. Kemudian akan dilakukan evaluasi terkait kinerja peralatan sistem proteksi berdasarkan hasil analisis studi dengan *resetting* menggunakan perhitungan teori. Berdasarkan hasil analisis studi, diketahui bahwa relai frekuensi, tegangan, dan daya balik masih beroperasi dengan layak karena memenuhi standar. Sementara itu, diketahui jika *setting existing* pada relai arus lebih masih belum memenuhi standar sehingga perlu dilakukan *resetting*. *Resetting* pada relai arus lebih meliputi penentuan *setting* arus *pickup*, *instananeous*, dan *time dial* supaya *grading time* antar peralatan sistem proteksi memenuhi standar IEEE 242, yaitu 0,2 - 0,4 detik.

Kata kunci : Sistem proteksi, koordinasi proteksi, arus hubung singkat, stabilitas *transient*, relai pengaman.

ABSTRACT

Analysis, Study, and Evaluation of the Coordination of Protection Equipment System on the 19 kV Switchgear of Unit 1 Geothermal Power Plant of PT Geo Dipa Energi (Persero) Dieng Unit.

Haidar Nabil Muflih

19/447060/SV/16779

At the Geothermal Power Plant (PLTP) of PT. Geo Dipa Energi (Persero) Unit Dieng, an electrical protection system is necessary to maintain the reliability and continuity of the generator in delivering electricity within the interconnected system of Java, Madura, and Bali. Each equipment in the protection system has its own settings and operating time, tailored to the protected area and the occurring disturbances. This study discusses the analysis, study, and evaluation of protection coordination in the 19 kV switchgear of Unit 1 at PT. Geo Dipa Energi (Persero) Unit Dieng. The study analysis is conducted by performing setting calculations and short-circuit simulation based on the existing conditions using the test data. The objective of the study analysis is to ensure the conformity of the existing settings with the standards and coordination principles. Subsequently, an evaluation of the performance of the protection system equipment will be conducted based on the results of the study analysis, with resetting using theoretical calculations. Based on the study analysis results, it is found that the frequency, voltage, and reverse power relays are still operating properly as they meet the standards. However, it is identified that the existing settings for the overcurrent relay do not yet comply with the standards and therefore require resetting. The resetting of the overcurrent relai includes determining the pickup current, instantaneous, and time dial settings to ensure the grading time between the protection system equipment meets the IEEE 242 standard, which is 0.2 - 0.4 seconds.

Keywords: *Protection system, protection coordination, short-circuit current, transient stability, protective relay.*