

ABSTRAK

ANALISIS DAN KOORDINASI *SETTING RELAY OVERCURRENT* PADA SISTEM PROTEKSI BLDG SS2001K PL

(2026: xv + 81 Halaman + Daftar Gambar + Lampiran)

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Sistem proteksi arus lebih pada jaringan tenaga listrik di PT Pertamina Patra Niaga memerlukan penyetelan relay yang tepat untuk menjaga keandalan dan keamanan operasi peralatan listrik. Penelitian ini membahas penyetelan *Over Current Relay* (OCR) dengan karakteristik *Very Inverse* berdasarkan data sistem berupa daya 150.000 kVA, tegangan 31 kV, CT ratio 200:5, nilai *Time Dial* (T) 0,0150, dan *Time Multiplier Setting* (TMS) 0,05. Berdasarkan data tersebut diperoleh arus nominal sistem sebesar 2.794,7 A, yang kemudian digunakan sebagai dasar dalam menentukan nilai arus pick-up dan karakteristik waktu operasi relay. Hasil perhitungan dan analisis menunjukkan bahwa relay bekerja sesuai karakteristik *very inverse*, yaitu semakin besar arus gangguan yang mengalir maka semakin cepat waktu operasi relay dalam memutus gangguan. Karakteristik ini menghasilkan koordinasi proteksi yang baik, mampu memberikan respon yang cepat terhadap gangguan arus lebih sekaligus tetap menjaga selektivitas sistem, sehingga peralatan listrik pada jaringan tenaga listrik di Refinery Unit III Plaju dapat terlindungi secara optimal dari potensi kerusakan akibat gangguan hubung singkat maupun beban lebih.

Kata Kunci : Over Current Relay (OCR), Proteksi Arus Lebih, *Very Inverse*, *Time Multiplier Setting* (TMS), Current Transformer (CT), Sistem Tenaga Listrik, Koordinasi Proteksi.

ABSTRACT

ANALYSIS AND COORDINATION OF OVERCURRENT RELAY SETTINGS IN THE PROTECTION SYSTEM OF BLDG SS2001K PL

(2026 : xv + 81 Page + List of Figures + List of Tables + List of appendix)

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The overcurrent protection system in the electrical power network of PT Pertamina Patra Niaga requires proper relay settings to ensure the reliability and safety of electrical equipment operation. This study discusses the setting of an Over Current Relay (OCR) with a Very Inverse characteristic based on system data consisting of a power rating of 150,000 kVA, a voltage level of 31 kV, a current transformer (CT) ratio of 200:5, a Time Dial (T) value of 0.0150, and a Time Multiplier Setting (TMS) of 0.05. Based on these parameters, the system nominal current was calculated to be 2,794.7 A, which was then used as the basis for determining the relay pick-up current and operating time characteristics. The calculation and analysis results indicate that the relay operates according to the very inverse characteristic, where the operating time decreases as the fault current increases. This characteristic provides effective protection coordination, enabling a rapid response to overcurrent faults while maintaining system selectivity. Consequently, electrical equipment within the power distribution network of Refinery Unit III Plaju can be optimally protected against damage caused by short-circuit faults and overload conditions.

Keywords: Over Current Relay (OCR), Overcurrent Protection, Very Inverse Characteristic, Protection Coordination, Electrical Power System, Current Transformer (CT), Time Multiplier Setting (TMS).