

ABSTRAK
ANALISIS PROTEKSI *OVER CURRENT* RELAI MOTOR COAL
MILL 2B 6P-2343-RM-B ANSI 50/51 PADA PEMBANGKIT STG-BB
DI PT PUPUK SRIWIDJAJA PALEMBANG
2026

(2026 : xvii + 62: Halaman + Daftar Pustaka + Lampiran)

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Keandalan motor induksi tegangan menengah, khususnya motor Coal Mill 2B 6P-2343-RM-B berkapasitas 400 kW pada unit pembangkit STG-BB PT Pupuk Sriwidjaja Palembang, sangat krusial dalam menjaga kontinuitas suplai bahan bakar batu bara. Penelitian ini bertujuan untuk mengevaluasi kinerja dan keandalan sistem proteksi *Over Current Relay* (OCR) berstandar ANSI 50 dan ANSI 51 tipe MiCOM P225 terhadap potensi gangguan hubung singkat dan fluktuasi beban mekanis tanpa melakukan pengujian *trip* secara langsung di lapangan. Metode penelitian yang digunakan meliputi analisis perhitungan matematis parameter setelan, pemodelan kurva *Time Current Characteristic* (TCC) berbasis standar IEC 60255-151, serta komparasi pembebanan harian melalui observasi aktual operasional selama 10 hari. Hasil analisis membuktikan bahwa penyetelan arus jatuh (*pickup*) pada 136 A dengan *Time Multiplier Setting* (TMS) 0,025 untuk ANSI 51, serta pemutusan seketika pada 1.680 A untuk ANSI 50, telah beroperasi secara presisi. Karakteristik kurva *Long Time Inverse* terbukti adaptif dalam memberikan toleransi lonjakan arus mula (*starting inrush current*) sekaligus mengamankan motor dari degradasi termal. Evaluasi data aktual menunjukkan bahwa motor beroperasi pada kondisi beban parsial dengan arus puncak 95,8 A, sehingga menyisakan margin keamanan (*safety margin*) yang sangat lebar, yakni di atas 40,2 A. Berdasarkan hasil tersebut, dapat disimpulkan bahwa koordinasi proteksi relai saat ini sangat selektif, stabil, dan sepenuhnya terhindar dari risiko pemutusan keliru (*false trip*) akibat variasi kekerasan material batu bara.

Kata Kunci: Motor Induksi, Relai Arus Lebih, Kurva TCC, *Long Time Inverse*, ANSI 50/51, MiCOM P225.

ABSTRACT
ANALYSIS OF COAL MOTOR RELAY OVER CURRENT PROTECTION
MILL 2B 6P-2343-RM-B ANSI 50/51 ON STG-BB POWER PLANT
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The reliability of medium-voltage induction motors, specifically the 400 kW Coal Mill 2B 6P-2343-RM-B motor at the STG-BB power plant of PT Pupuk Sriwidjaja Palembang, is crucial in maintaining the continuity of the coal fuel supply. This study aims to evaluate the performance and reliability of the ANSI 50 and ANSI 51 standard Over Current Relay (OCR) protection system, type MiCOM P225, against potential short-circuit faults and mechanical load fluctuations without conducting direct field trip tests. The research methods used include mathematical calculation analysis of setting parameters, Time Current Characteristic (TCC) curve modeling based on the IEC 60255-151 standard, and daily load comparison through actual operational observation for 10 days. The analysis results prove that the pickup current setting at 136 A with a Time Multiplier Setting (TMS) of 0.025 for ANSI 51, as well as the instantaneous cut-off at 1,680 A for ANSI 50, have operated precisely. The Long Time Inverse curve characteristic is proven to be adaptive in providing tolerance for starting inrush current while protecting the motor from thermal degradation. Evaluation of the actual data shows that the motor operates under part-load conditions with a peak current of 95.8 A, thereby leaving a very wide safety margin of over 40.2 A. Based on these results, it can be concluded that the current relay protection coordination is highly selective, stable, and completely secure from the risk of false trips due to variations in coal material hardness.

Keywords: *Induction Motor, Relay Over Current, Curve TCC, Long Time Inverse, ANSI 50/51, MiCOM P225.*