

ABSTRAK

ANALISA EFISIENSI DAYA PADA MOTOR *HYDRAULIC GRATE COOLER* MENGGUNAKAN *SOFT STARTER* DI PT SEMEN BATURAJA Tbk

(2026: xiv + 64 Halaman + Daftar Gambar + Daftar Tabel + Lampiran)

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Motor induksi tiga fasa pada sistem *Hydraulic Grate Cooler* di PT Semen Baturaja Tbk berfungsi menggerakkan *grate plate* dalam proses pendinginan klinker. Penelitian ini bertujuan untuk menganalisis kinerja *Soft Starter*, efisiensi motor, dan rugi-rugi daya selama operasi. Metode yang digunakan meliputi observasi lapangan, studi literatur, wawancara, serta pengambilan data operasi motor berupa arus, tegangan, dan putaran motor. Hasil penelitian menunjukkan bahwa penggunaan *Soft Starter* mampu menurunkan arus start menjadi 516,25–590 A dibandingkan metode *Direct On Line* (DOL) sebesar 1.770 A, sehingga terjadi pengurangan arus pengasutan sebesar 66,7%–70,8%. Analisis kinerja motor menunjukkan nilai efisiensi berada pada rentang 93,20%–93,93% dengan rata-rata 93,62%, sedangkan rugi-rugi daya berkisar antara 5.079,5–5.392,9 W. Hasil analisis juga menunjukkan bahwa peningkatan rugi-rugi daya cenderung menyebabkan penurunan efisiensi motor. Secara keseluruhan, motor masih beroperasi dengan baik dan penggunaan *Soft Starter* terbukti meningkatkan kestabilan operasi serta keandalan sistem *Hydraulic Grate Cooler*.

Kata Kunci: Motor Induksi Tiga Fasa, *Soft Starter*, *Hydraulic Grate Cooler*, Efisiensi Motor, Rugi-rugi Daya

ABSTRACT

POWER EFFICIENCY ANALYSIS OF THE HYDRAULIC GRATE COOLER MOTOR USING A SOFT STARTER AT PT SEMEN BATURAJA Tbk

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A three-phase induction motor in the *Hydraulic Grate Cooler* system at PT Semen Baturaja Tbk is used to drive the grate plates during the clinker cooling process. This study aims to analyze the performance of the *Soft Starter*, motor efficiency, and power losses during operation. The research methods included field observation, literature review, interviews, and the collection of operating data such as current, voltage, and motor speed. The results show that the implementation of a *Soft Starter* successfully reduced the starting current to 516.25–590 A compared to the *Direct On Line* (DOL) starting method, which reached 1,770 A, representing a reduction of approximately 66.7%–70.8%. Motor performance analysis indicated an efficiency range of 93.20%–93.93%, with an average efficiency of 93.62%, while power losses ranged from 5,079.5 W to 5,392.9 W. The analysis also revealed that higher power losses tend to decrease motor efficiency. Overall, the motor operated satisfactorily, and the *Soft Starter* effectively improved operational stability and system reliability.

Keywords: Three-Phase Induction Motor, *Soft Starter*, *Hydraulic Grate Cooler*, Motor Efficiency, Power Losses.