ELECTRICAL COMMISSIONING DAN PENGUJIAN *QUALITY CONTROL* MENGGUNAKAN PANEL INVERTER PADA MOTOR INDUKSI TIGA FASA PASCA OVERHAUL UNTUK MENGUURANGI *LOST* PRODUKSI DI PT. INDAH KIAT *PULP AND PAPER* PERAWANG

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ABSTRAK

Motor induksi tiga fasa merupakan salah satu peralatan utama yang digunakan sebagai penggerak mesin produksi di PT. Indah Kiat Pulp and Paper Perawang. Setelah dilakukan proses *overhaul*, motor tidak dapat langsung dioperasikan kembali, tetapi harus melalui tahapan *electrical commissioning* dan *quality control* untuk memastikan bahwa kondisi motor telah memenuhi standar kelayakan operasi. Penelitian ini bertujuan untuk mengetahui proses *electrical commissioning*, mengevaluasi hasil pengujian *quality control* menggunakan panel inverter, serta mengetahui pengaruhnya terhadap upaya mengurangi *lost production*.

Metode penelitian dilakukan melalui observasi langsung pada proses *overhaul* motor induksi tiga fasa berkapasitas 1250 kW di workshop motor PT. Indah Kiat Pulp and Paper Perawang. Tahapan penelitian meliputi proses *overhaul*, pengujian *winding resistance*, *winding surge*, *insulation resistance*, *polarization index* (PI), serta *running test* menggunakan panel inverter. Selanjutnya dilakukan pengukuran arus, tegangan, vibrasi, dan temperatur untuk mengevaluasi performa motor berdasarkan standar IEEE 1415-2006, IEEE Std 43, dan NEMA MG-1, IEEE 95-1997.

Hasil penelitian menunjukkan bahwa nilai ketidakseimbangan tahanan lilitan sebesar 2,176%, masih berada di bawah batas maksimum 5% sesuai standar IEEE 1415-2006. Nilai Polarization Index (PI) sebesar 2,36 telah memenuhi persyaratan IEEE Std 43 sehingga menunjukkan kondisi isolasi motor dalam keadaan baik. Pengujian *running test* menggunakan panel inverter juga menunjukkan arus, temperatur, dan vibrasi berada dalam batas yang diizinkan, sehingga motor dinyatakan layak untuk dioperasikan kembali. Penerapan *electrical commissioning* dan *quality control* secara sistematis terbukti mampu meningkatkan keandalan motor pasca-*overhaul*, mengurangi risiko kerusakan dini, menekan *downtime*, serta mendukung pengurangan *lost production* di PT. Indah Kiat Pulp and Paper Perawang.

Kata kunci: motor induksi tiga fasa, *electrical commissioning*, *quality control*, panel inverter, *overhaul*, *lost production*.

ELECTRICAL COMMISIONING AND QUALITY CONTROL TESTING USING INVERTER ON THREE PHASE INDUCTION MOTOR POST OVERHAUL TO REDUCE PRODUCTION LOSS AT PT. INDAH IKAT PULP AND PAPER PERAWANG

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ABSTRACT

Three-phase induction motors are one of the primary driving equipment used in the production process at PT. Indah Kiat Pulp and Paper Perawang. After the overhaul process, the motor cannot be directly returned to operation but must undergo electrical commissioning and quality control to ensure that its condition meets operational standards. This study aims to determine the implementation process of electrical commissioning, evaluate the results of quality control testing using an inverter, and analyze its contribution to reducing production losses.

The research was conducted through direct observation of the overhaul process of a 1250 kW three-phase induction motor at the motor workshop of PT. Indah Kiat Pulp and Paper Perawang. The research stages included the overhaul process, winding resistance test, winding surge test, insulation resistance test, polarization index (PI) test, and running test using an inverter. Furthermore, measurements of current, voltage, vibration, and temperature were carried out to evaluate the motor performance based on IEEE 1415-2006, IEEE Std 43, and NEMA MG-1, IEEE 95-1997.

standards.

The results showed that the winding resistance imbalance was 2.176%, which is below the maximum allowable limit of 5% according to the IEEE 1415-2006 standard. The Polarization Index (PI) value of 2.36 satisfies the minimum requirement specified in IEEE Std 43, indicating that the motor insulation condition is in good condition. The running test using the inverter also showed that the current, temperature, and vibration values were within the acceptable limits, confirming that the motor was suitable for reoperation. The implementation of systematic electrical commissioning and quality control has proven to improve the reliability of post-overhaul motors, reduce the risk of premature failures, minimize downtime, and support the reduction of production losses at PT. Indah Kiat Pulp and Paper Perawang.

Keywords: *three-phase induction motor, electrical commissioning, quality control, inverter, overhaul, production loss.*