

ABSTRAK

MUHAMAD ARAFAH TRIJUDIN P. HALER

Analisis Pengaruh Pekerjaan Dalam Keadaan Bertegangan (PDKB) terhadap Indeks Keandalan Jaringan Distribusi Listrik di UP3 Ternate

Dibimbing oleh Dr. Ir., Retno Aita Diantari., S.T., M.T., IPM., Asean Eng.

Keandalan sistem distribusi tenaga listrik merupakan faktor penting dalam menjamin kontinuitas dan kualitas pelayanan kepada pelanggan. PT PLN (Persero) terus melakukan upaya peningkatan keandalan jaringan melalui penerapan metode Pekerjaan Dalam Keadaan Bertegangan (PDKB). Penelitian ini bertujuan untuk menganalisis perubahan nilai indeks keandalan SAIDI dan SAIFI sebelum dan sesudah penerapan PDKB, menghitung persentase perubahan indeks, serta mengetahui kontribusi metode PDKB terhadap peningkatan keandalan sistem distribusi dan kualitas pelayanan pelanggan di PT PLN (Persero) UP3 Ternate tahun 2025. Metode yang digunakan adalah analisis kuantitatif terhadap data gangguan jaringan distribusi yang meliputi durasi pemadaman, frekuensi gangguan, jumlah pelanggan terdampak, dan energi tidak tersuplai (ENS). Hasil penelitian menunjukkan bahwa nilai rata-rata SAIFI mengalami penurunan dari 0,1107 kali/pelanggan menjadi 0,1044 kali/pelanggan atau sebesar 5,67%, yang menunjukkan peningkatan kontinuitas penyaluran energi listrik. Sementara itu, nilai SAIDI mengalami perubahan dari 0,0205 jam/pelanggan menjadi 0,0216 jam/pelanggan atau meningkat sebesar 5,36% akibat pengaruh gangguan eksternal dengan durasi pemulihan yang relatif lama. Nilai ENS juga mengalami perubahan dari 6.329 kWh menjadi 6.378 kWh atau meningkat sebesar 0,77%. Secara keseluruhan, penerapan metode PDKB memberikan kontribusi positif dalam menurunkan frekuensi gangguan, mengurangi pemadaman terencana, serta meningkatkan keandalan sistem distribusi dan kualitas pelayanan kepada pelanggan.

Kata Kunci : Keandalan sistem distribusi, SAIDI, SAIFI, ENS, PDKB, kualitas pelayanan listrik.

ABSTRACT

MUHAMAD ARAFAH TRIJUDIN P. HALER

Analysis of the Influence of Work Under Voltage (PDKB) on the Reliability Index of the Electricity Distribution Network in UP3 Ternate

Supervised by Dr. Ir. Retno Aita Diantari., S.T., M.T., IPM., Asean Eng.

The reliability of electric power distribution systems is an important factor in ensuring continuity and quality of service to customers. PT PLN (Persero) has implemented several strategies to improve network reliability, one of which is the application of Live Line Maintenance (LLM) or Pekerjaan Dalam Keadaan Bertegangan (PDKB). This study aims to analyze the changes in reliability indices, namely SAIDI and SAIFI, before and after the implementation of PDKB, to determine the percentage of improvement, and to evaluate the contribution of PDKB to the enhancement of distribution system reliability and service quality at PT PLN (Persero) UP3 Ternate in 2025. The research method used is a quantitative analysis based on distribution disturbance data, including outage duration, frequency of interruptions, number of affected customers, and Energy Not Supplied (ENS). The results show that the average SAIFI value decreased from 0.1107 interruptions per customer to 0.1044 interruptions per customer, or by 5.67%, indicating an improvement in service continuity. Meanwhile, the SAIDI value changed from 0.0205 hours per customer to 0.0216 hours per customer, or increased by 5.36%, mainly due to external disturbances with longer restoration time. The ENS value also changed from 6,329 kWh to 6,378 kWh, or increased by 0.77%. Overall, the implementation of PDKB has contributed positively to reducing the frequency of outages, minimizing planned outages, and improving the reliability of the distribution system as well as the quality of customer service.

Keywords: Distribution system reliability, SAIDI, SAIFI, ENS, live line maintenance, service quality.