

## **ABSTRAK**

Rafael Paerengan

### **ANALISIS PENGARUH METODE PDKB TERHADAP KEANDALAN SISTEM DISTRIBUSI 20 KV DI PLN UP3 MAMUJU**

Dibimbing oleh Syarif Hidayat, S.Si., M.T

Keandalan sistem distribusi tenaga listrik merupakan faktor penting dalam menjaga kontinuitas pelayanan kepada pelanggan. Di wilayah kerja PLN UP3 Mamuju, jaringan distribusi 20 kV memiliki tingkat kerentanan terhadap gangguan akibat pengaruh cuaca, kondisi geografis, dan karakteristik Saluran Udara Tegangan Menengah (SUTM). Penelitian ini bertujuan untuk menganalisis pola gangguan jaringan distribusi 20 kV, mengevaluasi kontribusi penerapan metode Pekerjaan Dalam Keadaan Bertegangan (PDKB) dalam menekan biaya operasional pemeliharaan, menganalisis risiko keselamatan kerja dan teknis PDKB terhadap keandalan sistem, serta mengkaji implikasi PDKB terhadap kualitas pelayanan dan kepuasan pelanggan. Metode penelitian yang digunakan adalah analisis kuantitatif dan deskriptif berdasarkan data gangguan, data pemeliharaan, serta indeks keandalan sistem berupa SAIFI, SAIDI, dan ENS tahun 2025. Hasil analisis menunjukkan bahwa pola gangguan bersifat fluktuatif dan didominasi oleh gangguan temporer. Nilai SAIFI tahunan sebesar 0,0178 kali/pelanggan/tahun menunjukkan frekuensi gangguan yang relatif rendah, sedangkan nilai SAIDI bersifat kumulatif dengan total 1.880,96 menit/pelanggan/tahun. Nilai ENS tercatat sebesar 85,885 MWh dan bernilai nol pada beberapa bulan. Hasil ini menunjukkan bahwa penerapan metode PDKB mampu meminimalkan gangguan akibat pemeliharaan serta meningkatkan keandalan dan kualitas pelayanan sistem distribusi 20 kV di PLN UP3 Mamuju.

Kata Kunci : keandalan sistem, jaringan distribusi 20 kV, PDKB, SAIFI, SAIDI, ENS.

## **ABSTRACT**

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*Analysis of the Impact of the PDKB Method on the Reliability of the 20 kV Distribution System at PLN UP3 Mamuju*

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*The reliability of the electric power distribution system is a key factor in maintaining service continuity for customers. In the service area of PLN UP3 Mamuju, the 20 kV distribution network is vulnerable to disturbances due to weather conditions, geographical characteristics, and the dominance of overhead medium-voltage lines. This study aims to analyze the disturbance patterns of the 20 kV distribution network, evaluate the contribution of Live-Line Maintenance (Pekerjaan Dalam Keadaan Bertegangan/PDKB) in reducing operational maintenance costs, assess occupational safety and technical risks, and examine the impact of PDKB on service quality and customer satisfaction. The research method applied is quantitative and descriptive analysis based on disturbance records, maintenance data, and reliability indices, namely SAIFI, SAIDI, and ENS for the year 2025. The results indicate that disturbance patterns are fluctuating and predominantly temporary. The annual SAIFI value of 0.0178 interruptions per customer per year reflects a relatively low interruption frequency, while the cumulative SAIDI reaches 1,880.96 minutes per customer per year. The ENS value is recorded at 85.885 MWh and shows zero values in several months. These results demonstrate that the implementation of PDKB effectively minimizes maintenance-related disturbances, improves system reliability, and enhances the quality of electric power services in the PLN UP3 Mamuju service area.*

*Keywords: system reliability, 20 kV distribution network, live-line maintenance (PDKB), SAIFI, SAIDI, ENS.*