ANALISIS KONTRIBUSI PEKERJAAN DALAM KEADAAN BERTEGANGAN (PDKB) DAN NON-PDKB TERHADAP PENINGKATAN KEANDALAN SISTEM DISTRIBUSI LISTRIK BERDASARKAN INDIKATOR SAIDI DAN SAIFI DI PT.PLN (PERSERO) UP3 JAYAPURA

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ABSTRAK

Pekerjaan Dalam Keadaan Bertegangan (PDKB) adalah strategi pemeliharaan jaringan distribusi listrik tanpa pemadaman, sehingga menjaga kontinuitas penyaluran energi. Sebaliknya, metode non-PDKB menimbulkan kehilangan energi (kWh tidak terselamatkan) dan menurunkan keandalan sistem.Penelitian ini menggunakan pendekatan kuantitatif dengan data operasi jaringan distribusi tahun 2025, mencakup jumlah gangguan, durasi dan frekuensi pemadaman, energi listrik terselamatkan, serta indikator keandalan SAIDI dan SAIFI. Hasil menunjukkan penerapan PDKB TM 20 kV di UP3 Jayapura mampu menyelamatkan1.877.948, 69 kWh atau setara Rp 2,71 miliar. Tanpa PDKB, potensi pendapatan tersebut hilang akibat pemadaman. Dari sisi keandalan, kondisi non-PDKB mencatat durasi pemadaman tertinggi 93,58 jam (Februari) dan frekuensi tertinggi 0,658 kali (Juli). Sebaliknya, PDKB menekan durasi gangguan hingga maksimum 5,06 jam.Dengan jumlah pelanggan mencapai 224.940 di akhir tahun, PDKB terbukti meningkatkan efisiensi operasional, kualitas pelayanan, dan keandalan sistem distribusi. Oleh karena itu, PDKB direkomendasikan sebagai strategi pemeliharaan utama di UP3 Jayapura.

Kata Kunci : PDKB, Pemeliharaan dengan Pemadaman, kWh Terselamatkan, SAIDI, SAIFI, Keandalan Sistem Distribusi, PT PLN (Persero) UP3 Jayapura.

ANALYSIS OF THE CONTRIBUTION OF LIVE-LINE MAINTENANCE (PDKB) AND NON-PDKB WORK TO THE IMPROVEMENT OF ELECTRICAL DISTRIBUTION SYSTEM RELIABILITY BASED ON SAIDI AND SAIFI INDICATORS AT PT PLN (PERSERO) UP3 JAYAPURA"

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ABSTRACT

Live-Line Maintenance (PDKB) is a strategy for maintaining electricity distribution networks without outages, thereby ensuring continuity of energy supply to customers. In contrast, non-PDKB methods cause energy losses (unsaved kWh) and reduce system reliability.This study employs a quantitative approach using distribution network operation data from 2025, covering the number of disturbances, outage duration and frequency, saved electricity, as well as reliability indicators SAIDI and SAIFI.The results show that the implementation of PDKB at 20 kV in UP3 Jayapura successfully saved 1,877,948.69 kWh, equivalent to Rp 2.71 billion. Without PDKB, this potential revenue would have been lost due to outages. In terms of reliability, non-PDKB conditions recorded the highest outage duration of 93.58 hours (February) and the highest frequency of 0.658 times (July). Conversely, PDKB reduced disturbance duration to a maximum of only 5.06 hours.With the number of customers reaching 224,940 at the end of the year, PDKB has proven to improve operational efficiency, service quality, and distribution system reliability. Therefore, PDKB is recommended as the main maintenance strategy at UP3 Jayapura.

Keywords*: PDKB, Maintenance with Blackouts, kWh Saved, SAIDI, SAIFI, Distribution System Reliability,* PT PLN (Persero) UP3 Jayapura.