

ABSTRAK

ANALISA EFISIENSI UMUR PAKAI BATERAI 2V *ORTSFEST* PANZERPLATTE VERSCHLOSSEN (OPZV) PADA SISTEM UPS *LIGHT* RAIL TRANSIT (LRT) STASIUN RSUD

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Penelitian ini bertujuan untuk menganalisis performa baterai OPzV (*Ortsfest Panzerplatte Verschlossen*) pada sistem *Uninterruptible Power Supply* (UPS) yang digunakan di LRT Stasiun RSUD. Baterai OPzV merupakan baterai asam timbal jenis gel yang dirancang untuk aplikasi stasioner, dengan keunggulan dalam daya tahan dan minim perawatan. Pengumpulan data dilakukan melalui observasi langsung, pengukuran lapangan, serta analisis dokumentasi teknis yang mencakup tegangan, arus pengisian, efisiensi coulomb, efisiensi energi, dan tegangan per sel. Hasil analisis menunjukkan bahwa efisiensi coulomb mencapai 100%, sedangkan efisiensi energi berada dalam kisaran yang baik, yaitu sekitar 91%. Tegangan rata-rata per sel juga menunjukkan kondisi stabil, sebagian besar berada di atas 2,20 V. Berdasarkan jumlah siklus pengisian-pengosongan, suhu operasi, serta nilai kapasitas aktual terhadap kapasitas nominal, dapat disimpulkan bahwa sistem baterai UPS masih berfungsi secara optimal. Temuan ini memberikan kontribusi terhadap pemahaman kondisi baterai stasioner dan pentingnya pemeliharaan berkala untuk menjamin keandalan sistem kelistrikan darurat.

Kata kunci: Baterai OPzV, UPS, efisiensi baterai, tegangan per sel, LRT RSUD

ABSTRACT

ANALYSIS OF THE LIFETIME EFFICIENCY OF 2V ORTSFEST PANZERPLATTE VERSCHLOSSEN (OPZV) BATTERY IN THE UPS SYSTEM OF THE LIGHT RAIL TRANSIT (LRT) RSUD STATION

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This study aims to analyze the performance of OPzV (Ortsfest Panzerplatte Verschlossen) batteries in the Uninterruptible Power Supply (UPS) system used at the LRT RSUD Station. OPzV batteries are gel-type lead-acid batteries designed for stationary applications, offering long service life and low maintenance. Data collection was carried out through direct observation, field measurements, and analysis of technical documentation, covering parameters such as voltage, charging current, coulomb efficiency, energy efficiency, and cell voltage. The analysis results showed that the coulomb efficiency reached 100%, while the energy efficiency was within a good range, approximately 91%. The average cell voltage also indicated a stable condition, with most values above 2.20 V. Based on the number of charge-discharge cycles, operational temperature, and actual capacity compared to nominal capacity, it can be concluded that the UPS battery system is still operating optimally. These findings contribute to a better understanding of stationary battery conditions and the importance of regular maintenance to ensure the reliability of emergency power systems.

Keywords: *OPzV battery, UPS, battery efficiency, cell voltage, RSUD LRT*