

## ABSTRAK

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Analisis Kelayakan Sistem Baterai 110 VDC Pada Gardu Induk Soppeng  
Dibimbing oleh SUGENG PURWANTO,ST.,M.Sc.

Sistem baterai 110 VDC merupakan komponen utama dalam menjaga keandalan operasi gardu induk karena berfungsi sebagai sumber daya bagi peralatan proteksi, kontrol, dan telekomunikasi ketika suplai AC terganggu. Penelitian ini bertujuan untuk menganalisis kelayakan sistem baterai 110 VDC di Gardu Induk Soppeng melalui pengukuran tegangan sel, tegangan bank, performa sistem pengisian, serta kemampuan baterai dalam menopang beban DC. Data diperoleh melalui observasi lapangan, pengukuran teknis, dan dokumen operasional periode September hingga November 2025. Hasil penelitian menunjukkan bahwa tegangan bank baterai berada pada kisaran 119,4 V untuk Battery Bank 1 dan 123,0 V untuk Battery Bank 2 dengan deviasi tegangan sel masing-masing sebesar 0,14 V dan 0,18 V yang masih berada di bawah batas yang diizinkan. Tegangan output rectifier berada pada kisaran 123,0–123,1 V dengan arus masing-masing sekitar 6,5 A dan 6,6 A dalam kondisi *float charging*, sehingga sistem pengisian bekerja stabil. Berdasarkan hasil analisis kapasitas dan beban, Battery Bank 1 dengan kapasitas nominal 145 Ah dan Battery Bank 2 sebesar 300 Ah mampu menopang total arus beban DC sebesar 13,1 A dengan waktu *backup* yang memenuhi standar minimum sistem DC gardu induk. Dengan demikian, sistem baterai 110 VDC di Gardu Induk Soppeng dinyatakan layak dan andal sebagai sumber daya cadangan, namun pemeliharaan dan pemantauan berkala tetap diperlukan untuk menjaga keandalan jangka panjang.

Kata kunci: Baterai 110 VDC, Gardu Induk, Sistem Catu Daya DC, Kapasitas Baterai, Backup Time, Float Charging.

## **ABSTRACT**

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*Feasibility Analysis of 110 VDC Battery System at Soppeng Substation/  
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*The 110 VDC battery system is a key component in maintaining the reliability of substation operations because it serves as a power source for protection, control, and telecommunication equipment when the AC supply is interrupted. This study aims to analyze the feasibility of the 110 VDC battery system at the Soppeng Substation by measuring cell voltage, bank voltage, charging system performance, and the battery's ability to support DC loads. Data were obtained through field observations, technical measurements, and operational documents from September to November 2025. The results showed that the battery bank voltage was in the range of 119.4 V for Battery Bank 1 and 123.0 V for Battery Bank 2 with cell voltage deviations of 0.14 V and 0.18 V, respectively, which were still below the permitted limits. The rectifier output voltage was in the range of 123.0–123.1 V with currents of approximately 6.5 A and 6.6 A, respectively, in float charging conditions, so that the charging system worked stably. Based on the capacity and load analysis results, Battery Bank 1, with a nominal capacity of 145 Ah, and Battery Bank 2, with a capacity of 300 Ah, are capable of supporting a total DC load current of 13.1 A, with a backup time that meets the minimum standards for a substation DC system. Therefore, the 110 VDC battery system at the Soppeng Substation is deemed feasible and reliable as a backup power source. However, regular maintenance and monitoring are still required to maintain long-term reliability.*

*Keywords: 110 VDC Battery, Substation, DC Power Supply System, Battery Capacity, Backup Time, Float Charging.*