

ABSTRAK

MARYO

Pengujian Kapasitas Baterai 110V Unit 1 dalam Mendukung Keandalan Sistem DC
di Gardu Induk 150 kV Durikosambi

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Sistem DC 110 V pada gardu induk 150 kV memiliki peran vital dalam menjamin keandalan operasi peralatan proteksi, kontrol, dan sistem telekomunikasi. Keandalan sistem ini sangat bergantung pada kondisi baterai sebagai sumber cadangan. Oleh karena itu, diperlukan pengujian kapasitas baterai secara berkala untuk memastikan kemampuan suplai daya sesuai standar operasional. Tugas akhir ini membahas ruang lingkup pelaksanaan pengujian kapasitas baterai unit 1 sistem 110 V di Gardu Induk 150 kV Durikosambi. Metode pengujian yang digunakan adalah *constant current discharge test*, yaitu metode pengosongan baterai dengan arus konstan hingga mencapai tegangan akhir yang ditentukan. Proses pengujian meliputi persiapan peralatan, pengaturan arus pelepasan, pemantauan tegangan tiap sel, pencatatan waktu pelepasan, serta analisis hasil pengujian. Berdasarkan hasil pengujian, diperoleh kapasitas aktual baterai sebesar 297,6 Ah dari kapasitas nominal 300 Ah. Nilai ini setara dengan 99,2% terhadap kapasitas nominal. Mengacu pada standar IEEE 450 yang menetapkan batas kelayakan minimum sebesar 80%, maka hasil tersebut menunjukkan bahwa baterai masih berada dalam kondisi sangat baik dan layak operasi. Dengan demikian, sistem baterai unit 1 110 V di Gardu Induk 150 kV Durikosambi dinyatakan andal dan mampu mendukung kontinuitas suplai daya sistem proteksi dan kontrol secara optimal.

Kata Kunci : Gardu Induk 150 kV, Sistem DC 110 V, Uji Kapasitas Baterai, Constant Current Discharge Test, IEEE Standard, Keandalan Sistem.

ABSTRACT

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*Testing of 110V Unit 1 Battery Capacity to Support the Reliability of the DC System
at 150 kV Durikosambi Substation*

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The 110 V DC system in a 150 kV substation plays a vital role in ensuring the reliable operation of protection equipment, control systems, and telecommunication systems. The reliability of this system largely depends on the condition of the battery as a backup power supply source. Therefore, periodic battery capacity testing is required to ensure that the power supply capability complies with operational standards. This final project discusses the scope of the battery capacity testing implementation for unit 1 of the 110 V DC system at the 150 kV Durikosambi Substation. The testing method applied in this study is the constant current discharge test, which is a battery discharge method using a constant current until the specified end voltage is reached. The testing procedure includes equipment preparation, discharge current setting, monitoring of individual cell voltages, recording of discharge time, and analysis of the test results. Based on the test results, the actual battery capacity obtained was 297.6 Ah compared to the nominal capacity of 300 Ah. This value is equivalent to 99.2% of the nominal capacity. Referring to IEEE 450 standards, which specify a minimum acceptable capacity limit of 80%, the result indicates that the battery remains in very good condition and is fit for operation. Therefore, the Unit 1 110 V battery system at the 150 kV Durikosambi Substation is considered reliable and capable of optimally supporting the continuity of power supply for protection and control systems.

Keywords: 150 kV Substation, 110 V DC System, Battery Capacity Test, Constant Current Discharge Test, IEEE Standard, System Reliability.