Paper 11: Operational Strategies for a Multi-Source 66 kV Network: Design & Implementation

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Abstract:

This paper explores the operational and control strategies of a 66 kV electrical network linking the Ugandan national grid to two remote Central Processing Facilities (located 50 km and 100 km away), each equipped with independent generation units. It presents the design principles of the electrical control system, emphasizing the implementation of frequency and voltage regulation mechanisms to maintain grid stability in a multi-source environment. The study also investigates synchronization challenges arising from the integration of heterogeneous generation sources and introduces a Fast Load Shedding scheme designed to enhance system reliability under contingency conditions. Operational feedback from the end user is analyzed to evaluate the effectiveness and resilience of the deployed solutions in real-world applications.