

ABSTRACT

The electrical system on Morotai Island, North Maluku, is an electrical system that relies on diesel power plants (PLTD). With its great solar energy potential, the integration of solar power plants (PLTS) is expected to improve the stability and reliability of the system. This study aims to analyze the impact of interconnecting Solar Power Plants (SPP) on the electrical system in Morotai Island, particularly from the perspective of transient stability. The study also compares power flow and short-circuit current values in the system before and after PLTS integration, as well as analyzes the system's voltage and frequency response to static loads after PLTS installation. The scope of the research includes the location of Morotai Island, focusing on PLTS integration and simulations using software.

Research methods include literature review, data collection for modeling and simulation, and analysis of simulation results to evaluate short-circuit currents, power flow, and transient analysis. The research findings are expected to provide insights into the potential for improving the efficiency and reliability of the electrical system through PLTS integration, as well as serve as a foundation for the development of smarter and more sustainable renewable energy systems in the future. Additionally, this research includes the design of a small-scale solar power plant as a demonstration medium.

Keywords: electrical system stability, Morotai Island, Solar Power Plant (SPP), transient