

23. FAULT DETECTION AND ISOLATION IN LOW VOLTAGE DC-BUS MICROGRID SYSTEM

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A multi-terminal DC power systems cannot survive or sustain high magnitude faults during fault conditions and converters will shut down to protect themselves under faulted conditions. This makes locating faults in DC system difficult, and causes the DC bus to de-energize. A fault protection method for a low-voltage DC-bus microgrid system is presented. The main goal of the project is to detect and isolate faults in the DC-bus based microgrid system without interruption in the entire DC bus. A ring bus topology is utilized as the main DC bus and then bus is segmented into individual zones with solid state bi-directional switches used to isolate the zone in the event of a fault. Each zone is monitored and controlled by an individual segment controller. Also after fault clearance the circuit breaker recloses by comparing with the programmed threshold value. The DC ring bus is modelled with sources and load. A fault creation, detection, isolation and reclosing operation concept is simulated and simulation result is verified using MATLAB/SIMULINK.

Keywords - DC power systems, microgrid, power system protection, segment controller, solid-state switch.

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