

Bypassing the short-circuit faults in the switch-ladder multi-level inverter

ABSTRACT

A new hardware strategy is proposed to increase the reliability of the Switch-Ladder multi-level inverter against short-circuit (S.C.) faults in the H-Bridge and main switches Blocks. The strategy includes passive and active bypassing. Passive bypassing approach hires fuses in series-connection with the ladder`s steps. Instead, in the active method, relays are replaced the fuses and receive commands from a controller that monitors the short-circuit failures continuously. When a switch fails in short circuit behaviour, the ladder contains the failed switch is converted to open-circuit (O.C.). Owing to the ability of Switch-Ladder multi-level inverter to tolerate open-circuit faults due to its configuration and switching strategy, reliability is increased against short-circuit failures through inverting the short-circuit to open-circuit. At last the experimental result validates the claims.

Keyword: Passive; Active; Bypassing; Switch-ladder multi-level inverter