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Abstract:
Usually, Permanent magnet synchronous generator (PMSG) based wind turbine supplies power to the grid using a back-to-back converter system. Any fault in the transmission system may result in power imbalance between the converters, which causes a significant voltage to rise in the DC-Link system, which may damage the converter system and hamper the transient stability of the system. A breaking resistor based conventional protection system is used to protect the converter system. However, this protection system cannot dissipate the excess power if it exceeds the power dissipation ability of breaking resistor. To get rid of this problem a fuzzy logic-based protection system for DC-Link circuit is offered in this paper to enhance the power dissipation ability of breaking resistor and improve transient stability of the system. Simulation results prove that proposed protection method can improve the power dissipation ability of the breaking resistor and transient stability of the system compared to conventional protection system.

Keywords: PMSG, DC-Link protection, Buck converter, Fuzzy logic controller