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Title: Augmentation of DC-Link Protection System of PMSG Based Wind Turbine Using Fuzzy Logic Controlled Buck Controller System

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Abstract:

Recently, permanent magnet synchronous generator (PMSG) is one of the most familiar type of generator for wind power plant (WPP). Generally, PMSG is connected to grid using back to back converter. During fault period, power imbalance situation is happened between machine side and grid converter. As a result, the DC-link voltage can be rise significantly which can damage the whole converter system. In this paper, a novel DC-Link protection system of buck converter based on fuzzy logic is designed in order to augment the transient stability of the PMSG system. The new buck converter along with its control system is designed to manage the supplied voltage of the braking resistor during fault period. For investigating the performance of the proposed system, fault analysis is performed on different case scenarios PSCAD/EMTDC software.

Keywords: PMSG, power system stability, fuzzy logic controller, buck converter, DC-Link protection.