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Title: Fuzzy Logic Controlled DC-Link Protection Scheme of PMSG Based Wind Turbine

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Published Conference Name: 2nd International Conference on Robotics, Electrical and Signal Processing Techniques (ICREST'21)

Type of Publication: International Conference

Volume: _____ **Issue** _____

Publisher: IEEE

Publication Date: February 1, 2021

ISSN: _____

DOI: <https://doi.org/10.1109/ICREST51555.2021.9331167>

URL: <https://ieeexplore.ieee.org/document/9331167>

Other Related Info.: Pages 1-5

Citation: Md. Zubairul Haque, Md. Rifat Hazari, Mohammad Abdul Mannan and Junji Tamura, “Fuzzy Logic Controlled DC-Link Protection Scheme of PMSG Based Wind Turbine,” Proceedings on 2021 2nd International Conference on Robotics, Electrical and Signal Processing Techniques (ICREST'21), American



AIUB DSpace Publication Details

International University-Bangladesh, Dhaka, Bangladesh, pp. 183-187, January 2021.

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