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Line-Fault Ride-Through (LFRT) Capabilities of DFIG Wind Turbine Connected to the Power System

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Abstract

With increased penetration of wind power into electrical grids, DFIG wind turbines are largely deployed due to their variable speed feature and hence influencing system dynamics.

According to grid codes issued by utilities, tripping of wind turbines following power system faults is not allowed. Besides, to provide voltage support to the grid, reactive current supply is necessary. This paper studies the power flow (PF) of two different networks, the first is a transmission network and the second is a distribution one, A wind Doubly-Fed Induction Generator (DFIG) turbine is injected to these different networks.

A line fault right through (LFRT) is applied on each network and the power flow results are given and compared, then a new solution is proposed to connect the wind turbine to the distribution network with a down transformer to not disconnect the wind turbine during the LFRT, the power system analysis toolbox (PSAT) is used in this work.

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Keywords: DFIG, Distribution, Line fault, Power flow, PSAT, Transmission network.

1. Introduction

With increased penetration of wind power into electrical grids, Doubly-Fed Induction Generator (DFIG) wind turbines are largely deployed due to their variable speed feature and hence influencing system dynamics.

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