

Accepted Manuscript

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PII: S2352-4677(16)30132-1

DOI: <http://dx.doi.org/10.1016/j.segan.2016.11.001>

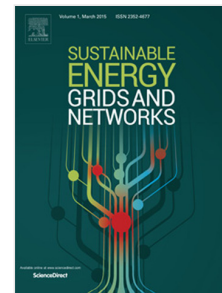
Reference: SEGAN 81

To appear in: *Sustainable Energy, Grids and Networks*

Received date: 23 March 2016

Revised date: 5 August 2016

Accepted date: 6 November 2016



Please cite this article as: M.R. Amer, O.A. Mahgoub, New switching technique for current control of grid converters for wind power systems, *Sustainable Energy, Grids and Networks* (2016), <http://dx.doi.org/10.1016/j.segan.2016.11.001>

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New Switching Technique for current control of Grid Converters for Wind Power Systems

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Abstract - A novel modification is applied to the hysteresis band (HB) modulation technique for direct current control in Grid side converters (GSC). This method employs a pair of hysteresis bands (a positive one and a negative one) and changes these bands according to the conduction times of the inverter switches. The rate of change of generated current is dependent on two factors: the instantaneous grid voltage and the conduction times of the inverter switches. The objective of changing the hysteresis bands is varying the switching frequency to reduce the ripple produced in grid currents. The proposed method is analyzed and tested in switching a voltage source grid connected converter applied in wind power systems. The matlab based simulations and experimental results validate efficacy of the new switching modulation method in decreasing the current ripple, switching losses, and Total harmonic distortion (THD) of Grid current.

Keywords - Grid side converter (GSC), Hysteresis Switching Technique, Doubly Fed Induction Generator (DFIG).

I. INTRODUCTION

Wind energy is playing an increasingly important role in the supply of energy of most industrialized countries, and its share of the electrical generation is expected to continue to increase for many years to come. The EUs target for 2020 is a 20% share of energy from renewable sources; it is assumed that a high percentage of the expected growth will be from wind power [1]. Recent findings suggest that the share of 20% may even be exceeded at least in some regions [2]

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