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Synchronization and Control of Battery Based Wind Energy Conversion System

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Abstract: *In this proposed work, a battery based wind energy conversion system is developed for voltage and frequency regulation for isolated locations for 3-phase 4-wire system. The isolated system consists of wind turbine, self excited induction generator (SEIG), capacitor bank, voltage source converter (VSC), battery system and nonlinear load. A modified least mean square (MLMS) control is utilized to extract the fundamental component from load current and generate switching pulses for VSC. The proposed control with VSC provides voltage/frequency regulation, harmonics suppression, power support, load balancing and enhances the overall power quality of the isolated system. A battery system is developed at dc-side of the VSC to consume extra power under minimum load demand and maintain the power balance at point of common coupling (PCC) between power generation and load. The proposed system is designed in MATLAB/Simulink environment under different operating conditions.*

Keywords: Point of Common Coupling**,** Self Excited Induction Generator, VSC

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