POWER QUALITY IMPROVEMENT IN GRID CONNECTED WIND ENERGY SYSTEM USING UPQC

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ABSTRACT

Injection of the wind power into an electric grid affects the power quality. The performance of the wind turbine and thereby power quality are determined on the basis of measurements and the norms followed according to the guideline specified in International Electro-technical Commission standard, IEC-61400.This paper demonstrates the power quality problem due to installation of wind turbine with the grid. In this proposed scheme Unified Power Quality Conditioner (UPQC)is connected at a point of common coupling with a battery energy storage system (BESS) to mitigate the power quality issues. The battery energy storage is integrated to sustain the real power source under fluctuating wind power. The UPQC control scheme for the grid connected wind energy generation system for power quality improvement is simulated using MATLAB/SIMULINK in power system block set. The effectiveness of the proposed scheme relives the main supply source from the reactive power demand of the load and the induction generator. The development of the grid co-ordination rule and the scheme for improvement in power quality norms as the grid has been presented.

KEYWORDS: International Electro-Technical Commission (IEC), Power Quality, Wind Generating System (WGS)