

## **27. SRF THEORY BASED GRID INTERFACED RENEWABLE SYSTEM FOR POWER QUALITY IMPROVEMENT**

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Wind power is one of the optimistic sources of energy generation among all the renewable energy sources. Hence for exploiting wind energy sources it must be connected to electric grid. Integration of wind power into power grid has developed several problems like lack of reactive power at point of common coupling which leads to voltage stability problems for the utility owner. 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 recommends a control scheme based on instantaneous SRF(Synchronous Reference Frame) theory for compensating the reactive power requirement of a three phase grid connected wind energy generating system along with the mitigation of harmonics produced by non linear load connected at PCC using STATCOM. In this proposed scheme a STATCOM (static synchronous compensator) is connected at a point of common coupling with a battery energy storage system (BESS) to mitigate the power quality problems is simulated using MATLAB/SIMULINK in Simpower system block set. The battery energy storage is integrated to sustain the real power source under fluctuating wind power. Fuzzy based controller is designed to improve the profile of source current in STATCOM.

Index Terms—International Electro-technical Commission (IEC), power quality, Wind Energy Generating System (WEGS), Fuzzy Logic Controller (FLC).

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