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Optimal Tuning of RST Controller Using PSO Optimization for Synchronous Generator Based Wind Turbine under Three-Phase Voltage Dips

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Abstract : In this paper, we presented an optimized RST controller using Particle Swarm Optimization (PSO) meta-heuristic technique of the active and reactive power regulation of a grid connected wind turbine based on a wound field synchronous generator. This regulation is achieved below the synchronous speed, by means of a maximum power point tracking algorithm. The control of our system is tested under typical wind variations and parameters variation, fault grid condition by simulation. Some results are presented and discussed to prove simplicity and efficiency of the WRSG control for WECS. On the other hand, according to simulation results, variable speed driven WRSG is not significantly impacted in fault conditions.

Keywords : wind energy, particle swarm optimization, wound rotor synchronous generator, power control, RST controller, maximum power point tracking
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