

Improving the Foul Ride through Capability and Stability of Wind Farms with DFIG Wind Turbine by Using Statcom

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Abstract : The concern of reducing emissions of Co2 from the fossil fuel generating units and using renewable energy sources increased in our world. Due this fact the integration ratio of wind farms to grid reached 20-30% in some part of our world. With increased integration of large MW scaled wind farms to the electric grid, the stability of the electrical system is a great concern. Thus, operators of power systems usually demand the wind turbine generators to obey the same rules as other traditional kinds of generation, such as thermal and hydro, i.e. not affect the grid stability. FACTS devices such as SVC or STATCOM are mostly installed close to the connection point of the wind farm to the grid in order to increase the stability especially during faulty conditions. In this paper wind farm with DFIG turbine type and STATCOM are dynamically modeled and simulated under three phase short circuit fault condition. The dynamic modeling is done by DigSILENT PowerFactory for the wind farm, STATCOM and the network. The simulation results show improvement of system stability near to the connection point of the STATCOM.

Keywords : DFIG wind turbine, statcom, dynamic modeling, digsilent

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