Coordinated Reactive Power Control of DFIG to Improve LVRT Charateristics of FSIG in Wind Turbine Generation

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***Abstract*— In almost all European countries, the penetration of wind power systems and the wind turbines size continuously increases. Therefore, the grid code requirements are more and more restrictive concerning the necessity that the wind turbine to remain connected to the grid during a grid fault. This paper analyzes the possibilities to have more accurate wind generation transient stability models for fixed speed wind turbined and variable speed wind turbines. Wind system using a fixed-speed wind power generation SCIG (FSIG) tends to drain large amount of reactive power from the grid, potentially causing a drop voltage and perhaps voltage stability conundrum. To improve the SCIG's low voltage ride through (LVRT) characteristics, this paper presents a new control strategy for a variable-speed wind power generation DFIG (Doubly-fed Induction Generator) located in the vicinity of the grid using the control capability of PI technique. The proposed control system regulates effectively reactive power output of the DFIG wind turbine by controlling both grid-side and rotor-side converters to compensate the reactive power absorbed by the SCIG-based wind turbine. Simulation results matched well with the theoretical wind turbines operation.**
***Keywords*— SCIG, DFIG, PMSG, wind turbine, wind energy.**

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