Title: Transient analysis of variable-speed wind turbines at wind speed disturbances and a pitch control malfunction

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Abstract: As wind power generation undergoes rapid growth, new technical challenges emerge: dynamic stability and power quality. The influence of wind speed disturbances and a pitch control malfunction on the quality of the energy injected into the electric grid is studied for variable-speed wind turbines with different power-electronic converter topologies. Additionally, a new control strategy is proposed for the variable-speed operation of wind turbines with permanent magnet synchronous generators. The performance of disturbance attenuation and system robustness is ascertained. Simulation results are presented and conclusions are duly drawn. (C) 2010 Elsevier Ltd. All rights reserved.

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