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Title: A Pitch Control Malfunction Analysis for Wind Turbines with Permanent Magnet Synchronous Generator and Full-power Converters: Proportional Integral Versus Fractional-order Controllers

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Abstract: A transient analysis for two full-power converter wind turbines equipped with a permanent magnet synchronous generator is studied in this article, taking into consideration, as a new contribution to earlier studies, a pitch control malfunction. The two full-power converters considered are, respectively, a two-level and a multi-level converter. Moreover, a novel control strategy based on fractional-order controllers for wind turbines is studied. Simulation results are presented; conclusions are in favor of the novel control strategy, improving the quality of the energy injected into the electric grid.

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