Comprehensive Full-Scale Converter Wind Park Initialization for Electromagnetic Transient Studies

Juan Antonio Ocampo Wilches[1], Jean Mahseredjian[1], Keijo Jacobs[1], Ahda G. Pavani[2], Haoyan Xue[1]

[1]Polytechnique Montreal, [2]Federal University of ABC

This paper proposes a comprehensive method for initializing the electromagnetic transient models of full-scale converter wind parks. The method uses the ac load-flow solution to initialize the mechanical model, the electrical components, the machine, the converter and the control systems. The effectiveness of the method is demonstrated through EMT simulations of three different power system benchmarks: an aggregated WP connected to a small transmission grid, a detailed WP model with wind turbines connected to a small transmission grid, and a large-scale transmission grid with ten different aggregated WPs. The results show that the proposed method reduces computing times required to reach steady-state and consequently accelerates overall simulations.

979-8-3315-8138-1