Field Validation of IEC 61400-27-1 Wind Generation Type 3 Model with Plant Power Factor Controller - DTU Orbit (24/01/2019)

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Generic electrical simulation models of wind power generation have been developed as standards, such as the IEC 61400-27-1, to be used by wind industry, system operators, and academia for power system stability studies. In this paper, the IEC type 3 wind turbine model with wind turbine level voltage controller and with wind power plant level power factor controller is validated based on field measurements from a 52-MW wind power plant. In addition to the validation of the IEC type 3 wind turbine and wind power plant controller models, a comparison of the validation approaches, which are the full grid and play-back simulation, is provided together with a survey of the existing validation studies and recommendations for future modeling and validation tasks. The implemented IEC models are tuned to match the measurements accurately and the validated values for the control parameters of the reference wind power plant model are given.

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