Wind Turbine and Wind Power Plant Modelling Aspects for Power System Stability Studies
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Large amount of wind power installations introduce modeling challenges for power system operators at both the planning and operational stages of power systems. Depending on the scope of the study, the modeling details of the wind turbine or the wind power plant are required to be different. A wind turbine model which is developed for the short-term voltage stability studies can be inaccurate and sufficient for the frequency stability studies. Accordingly, a complete and detailed wind power plant model for every kind of study is not feasible in terms of the computational time and also is not reasonable regarding the focus of the study. Therefore the power system operators should be aware of the modelling aspects of the wind power considering the related stability study and implement the required model in the appropriate power system toolbox. In this paper, the modelling aspects of wind turbines and wind power plants are reviewed for power system stability studies. Important remarks of the models are presented by means of simulations to emphasize the impact of these modelling details on the power system.

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