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Implementation of IEC Generic Model Type 1 Wind Turbine Generator using RTDS

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Abstract:

With the ever increasing penetration of the wind power generation, transmission system operators (TSOs) and distribution system operators (DSOs) are demanding an accurate dynamic wind turbine generator (WTG) models for power system stability studies. However, the confidential requirements from wind turbine manufacturers prevent the academia and researchers from working on a real or/and manufacturer specific models. A generic WTG model is of great interest that does not contain the confidential information meanwhile represents the manufacturer specific models. These generic dynamic simulation models are useful tools to evaluate the impact of the wind power on the power system stability. Thus, a strong stimulus exists for the development of a generic dynamic model in order to further investigate the dynamic response of WTG under grid disturbances. This paper presents the implementation of the IEC generic Type 1A and 1B WTG models in the real time digital simulator (RTDS) environment. Case studies have been carried out to verify the performance of the IEC generic Type 1 WTG model under both steady state and dynamic conditions. The case study results show that the IEC generic Type 1 WTG model can represent the performance of Type 1 WTGs under both steady state and dynamic conditions.