Compatibility of IEC 61400-27-1 Ed 1 and WECC 2nd Generation Wind Turbine Models

The IEC TC88 WG27 and the Western Electric Coordinating Council (WECC) Renewable Energy Modeling Task Force, in North America, have been developing the IEC 61400-27-1 and WECC 2nd Generation Wind Turbine generic electrical models, where the first editions are published in 2014 and 2013, respectively. Although the two working groups have been collaborating closely, there are small differences between the approaches of the two modelling standards, especially in terms of parameter sets and complexities for different functions. In this paper, compatibility of the IEC and WECC wind turbine models has been investigated, via pointing out the common parts and small discrepancies. It is shown that via parametrizing accordingly, similar responses can be obtained from both of the models and both models can be utilized well to represent the real wind turbines. The compatibility is shown via model to model comparison of the IEC and WECC wind turbines' simulation results for the wind turbine types 3 and 4, which are the most common technologies. Additionally, detailed behavior of the IEC type 3 model during voltage drop and recovery are compared against measurements.

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