

Complete Operational Voltage Assessment of Shandong Pilot Offshore Wind Project

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Abstract

This paper presents a thorough methodology for the voltage assessment of pilot offshore wind project in Shandong province, China. The results presented in this paper can be considered as the milestone of the offshore wind research in Shandong since there is still no grid codes for offshore wind power plant grid connection in the local electrical power grid. It mainly consists of three parts. In the first part, a detailed model of the offshore wind farm created in the DlgSILENT PowerFactory simulation platform is presented, including wind turbines, power converters, transformers, submarine cables and relevant control schemes. In the second part, nonlinear time-domain simulations were performed to analyse the wind farm's active power, reactive power, and voltage conditions under different wind scenarios. Based on the simulations results, a dynamic reactive power compensation system was proposed, and the consequence of the reactive power compensation was also demonstrated using nonlinear time-domain simulations.

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