

Analysis of the influence of large-scale offshore wind power on the steady-state voltage of the vicinity region of grid connection point

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Abstract

The power characteristics of offshore wind power will change the regional power flow distribution and affect the regional voltage. In this paper, the direct-drive wind turbine generator controlled by unity power factor is selected as the research object, and the influence of change of wind power on voltage at the grid connection point is analyzed from the simple integration model. Based on the two critical states of the external equivalent power of the grid connection point, an analytical expression of the output of wind power in the corresponding state is obtained, and the relationship among the critical state outputs, the output of wind power and the parameters at the grid connection point is drawn, hence the related influence laws is analyzed. The influence of change of wind power on voltage and regional reactive power and the reactance distribution of transmission lines near the grid connection point is considered to analyze the influence of offshore wind power on the vicinity region of grid connection point. The rationality of the conclusion is verified by study the cases of the integration of offshore wind power into Guangdong power grid, and some suggestions are put forward for the planning of offshore wind power integration.

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