## Assessing the Effect of Grid Connection of Large-Scale Wind Farms on Power System Small-Signal Angular Stability

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**Abstract :** Grid connection of a large-scale wind farm affects power system small-signal angular stability in two aspects. Firstly, connection of the wind farm brings about the change of load flow and configuration of a power system. Secondly, the dynamic interaction is introduced by the wind farm with the synchronous generators (SGs) in the power system. This paper proposes a method to assess the two aspects of the effect of the wind farm on power system small-signal angular stability. The effect of the change of load flow/system configuration brought about by the wind farm can be examined separately by displacing wind farms with constant power sources, then the effect of the dynamic interaction of the wind farm with the SGs can be also computed individually. Thus, a clearer picture and better understanding on the power system small-signal angular stability as affected by grid connection of the large-scale wind farm are provided. In the paper, an example power system with grid connection of a wind farm is presented to demonstrate the proposed approach.

**Keywords :** power system small-signal angular stability, power system low-frequency oscillations, electromechanical oscillation modes, wind farms, double fed induction generator (DFIG)

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