

Maximizing Wind Farm Power Using Wake Control System

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Abstract

The aim of this paper is to achieve a higher cost-effectiveness and production efficiency of a single and multi-wind turbines using optimal effective method. The power components and the loading for a wind turbine are the pitch angles, nacelle system control and generator factors. However, the nacelle yaw and pitch angles may control by the wake characterized in a way that may influence on other wind turbines in the farm. An optimization problem is formulated with the objective of maximizing the sum of the power production of a wind farm. The optimal combination of Yaw offset angles and the induction factor is obtained by applying the first order Taylor's expansion and trial and error method. The results show that the smart system strategy can increase the power production in wind farm. Supervisory Control and Data Acquisition (SCADA) is a type of Industrial control systems are computer-controlled systems that monitor and control industrial processes that exist in the physical world. The contribution of this work is to control and apply optimal values on wind turbines.