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Wind power generation device control system

Overview

What are advanced wind turbine controls?

Advanced wind turbine controls can reduce the loads on wind turbine components while capturing more wind energy and converting it into electricity. NREL is researching new control methodologies for both land-based wind turbines and offshore wind turbines.

How does a wind turbine control work?

The designed control maximizes the wind turbine (WT) power generation by regulating the electrolyzer current consumption, where the electrolyzer operates as a controlled load, ensuring power balance in the system and enabling the generation of maximum power from the WECS without the use of any energy storage system.

What is next-generation wind turbine control?

With turbines growing taller, blades extending longer, and installations expanding into offshore areas, supporting control systems must evolve to meet the complex demands of future power grids. This evolution calls for next-generation wind turbine control systems—a fusion of intelligent automation, digitalization, and adaptive control technologies.

How can a wind generation system be regulated?

One approach involves operating the wind generation system with power reserve, achieved by shifting the MPPT reference. In this approach, the pitch angle can be regulated based on frequency deviations, enabling power reserves to participate in primary frequency control 156.

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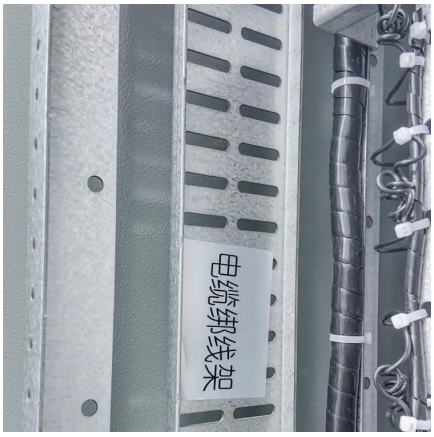

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Wind Turbine Control Systems , Wind Research , NLR

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