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Nota di contenuto	Status of wind power technologies / Haoran Zhao, Qiuwei Wu -- Grid code requirements for wind power integration / Qiuwei Wu -- Control of doubly-fed induction generators for wind turbines / Guojie Li , Lijun Hang -- Optimal control strategies of wind turbine for load reduction / Shuju Hu, Bin Song -- Modeling of full scale converter wind turbine generator / Yongning Chi, Chao Liu, Xinshou Tian, Lei Shi, Haiyan Tang -- Clustering based wind turbine generator model linearization / Haoran Zhao, Qiuwei Wu -- Adaptive control of wind turbines for maximum powerpoint tracking (MPPT) / Haoran Zhao, Qiuwei Wu -- Distributed model predictive active power control of wind farms / Haoran Zhao, Qiuwei Wu -- Model predictive voltage control of wind power plants / Haoran Zhao, Qiuwei Wu -- Control of wind farm cluster / Yan Li, Ningbo Wang, Linjun Wei, Qiang Zhou -- Fault ride-through enhancement of VSC HVDC connected offshore wind power plants / Ranjan Sharma, Qiuwei Wu, Kim Hj Jensen, Tony Wederberg Rasmussen, Jacob stergaard -- Electromechanical power oscillation damping from

VSC-HVDC connected offshore wind power plants -- State-of-art and practical approach to implementation / Lorenzo Zeni.

Sommario/riassunto

An essential reference to the modeling techniques of wind turbine systems for the application of advanced control methods -- This book covers the modeling of wind power and application of modern control methods to the wind power control—specifically the models of type 3 and type 4 wind turbines. The modeling aspects will help readers to streamline the wind turbine and wind power plant modeling, and reduce the burden of power system simulations to investigate the impact of wind power on power systems. The use of modern control methods will help technology development, especially from the perspective of manufacturers. -- Chapter coverage includes: status of wind power development, grid code requirements for wind power integration; modeling and control of doubly fed induction generator (DFIG) wind turbine generator (WTG); optimal control strategy for load reduction of full scale converter (FSC) WTG; clustering based WTG model linearization; adaptive control of wind turbines for maximum power point tracking (MPPT); distributed model predictive active power control of wind power plants and energy storage systems; model predictive voltage control of wind power plants; control of wind power plant clusters; and fault ride-through capability enhancement of VSC HVDC connected offshore wind power plants. Modeling and Modern Control of Wind Power also features tables, illustrations, case studies, and an appendix showing a selection of typical test systems and the code of adaptive and distributed model predictive control. . Analyzes the developments in control methods for wind turbines (focusing on type 3 and type 4 wind turbines). Provides an overview of the latest changes in grid code requirements for wind power integration. Reviews the operation characteristics of the FSC and DFIG WTG. Presents production efficiency improvement of WTG under uncertainties and disturbances with adaptive control. Deals with model predictive active and reactive power control of wind power plants. Describes enhanced control of VSC HVDC connected offshore wind power plants -- Modeling and Modern Control of Wind Power is ideal for PhD students and researchers studying the field, but is also highly beneficial to engineers and transmission system operators (TSOs), wind turbine manufacturers, and consulting companies.