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# An Overview of Wind Turbines Control Systems

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Report

## *Highlights*

- Different methods for regulation of wind turbine power
- Ensuring reliable and efficient operation of wind turbines under variable wind speeds
- Wind turbines are inherently nonlinear and time-varying


## *Abstract*

*This paper provides an overview of the latest expert literature on wind turbine control systems. Some techniques used in the control of horizontal-axis wind turbines at the individual turbine level are presented and explained in more detail. These controls apply to the blade pitch and generator power. The turbine system is modeled as a flexible structure operating under the presence of turbulent wind disturbances. A review of various turbine operating phases and control strategies aimed at maximizing energy conversion at sub-nominal wind speeds is provided, with a focus on managing aerodynamic loads when the turbine operates at maximum power. After reviewing the basic objectives of turbine control, the paper gives an overview of common linear control approaches and then describes advanced control architectures, addressing why they may provide greater benefits.*



## *Keywords*

**Linearized wind turbine model, wind generator, wind speed, wind turbine efficiency, wind turbine power regulation**

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***Note:***
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