

Wind turbine mechanical system





Overview

The design of large wind turbine drivetrain systems is trending towards light weight and integration. To ensure the safe operation of the drivetrain system, investigating the electromechanical-rigid-flexibl.

What is a wind turbine transmission system?

A wind turbine transmission system is a critical component for converting wind energy into electrical energy. Wind turbine drivetrains are continually being developed to be lightweight and produced in large scale to improve the power density and power generation of wind turbines.

Does a wind turbine drivetrain have electromechanical coupling characteristics?

5. Conclusion To study in-depth the electromechanical coupling characteristics of a wind turbine drivetrain system, this study proposes a gearbox-generator electromechanical-rigid-flexible coupling dynamic model that can be used in variable-speed and variable-load operating conditions.

How a wind turbine control system works?

The control system uses voltage vector and pitch angle control to ensure the maximum wind energy tracking and safety of the system, as shown in Figure 2C. In the following analysis, the cut-in wind speed of the wind turbine was 4.5 m/s, the rated wind speed was 12 m/s, and the cut-out wind speed was 20 m/s.

What are the frequency components of a wind turbine gear system?

The electrical system frequency components were appeared by $6kfe$ and $(h - 1)fe$ in the mechanical system. As for the current signal, there are modulation frequency components in the form of $(6k \pm 1)fe \pm nfm$ in the high frequency region. This can lay a theoretical foundation for the current fault diagnosis of the wind turbine gear system.



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Mechanical modeling of wind turbines and their components

The models are divided into wind turbine components as shown in the following representation of an offshore wind turbine. This newly developed tool is used to optimize offshore wind turbines ...



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