

Design parameters of ground-mounted wind turbine transmission 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-flexible.

What are the components of a wind turbine transmission system?

As shown in Fig. 1, the gearbox-generator transmission system includes the main shaft, main shaft seat, gear system, permanent magnet synchronous generator (PMSG), and housing. The 8-MW wind turbine gear system comprises a three-stage planetary gear system.

What is improved transmission structure of a wind turbine gearbox?

An improved transmission structure of the wind turbine gearbox is presented for the low-wind speed areas, based on the optimized P - v curve of the variable-speed double-fed wind turbine. Transmission characteristics of the improved transmission system are analyzed.

Can dynamic fatigue reliability sensitivity predict a wind turbine gear transmission?

In this work, a novel gear transmission optimization model based on dynamic fatigue reliability sensitivity is developed to predict the optimal structural parameters of a wind turbine gear transmission. In the model, the dynamic fatigue reliability of the gear transmission is evaluated based on stress-strength interference theory.

What is a wind turbine transmission system?

Many countries are vigorously developing their wind power industries. 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.

What factors affect the dynamic characteristics of wind turbine drivetrains?

In the traditional design and previous studies of wind turbine drivetrains, Qin et al. , , studied the internal excitation of the gear system (such as bearing support stiffness, time-varying mesh stiffness, and tooth side clearance) and its effect on the dynamic characteristics of wind turbine drivetrains.

What are the dynamic characteristics of Integrated wind turbine drivetrain system?

The integrated wind turbine drivetrain system operates under variable-speed and variable-load conditions for a long time and is affected by multi-source excitation from the internal excitation of the gear system, the internal excitation of the generator, and the external wind load; hence, its dynamic characteristics are complex.

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