Elastic support for wind turbine generators

What is elastic support of a wind turbine?

1. INTRODUCTION The elastic support of the generator for wind turbine is a flexible structure connecting the generator and the rear frame,and its function is mainly to reduce the vibration transmitted from the generator to the rear frame.

What is the stiffness of elastic support of a wind turbine generator?

According to the structural characteristics of the elastic support,Kx equals Ky . Due to the decline of stiffness,the strength and carrying capacity of the elastic support will decrease. Based on the experience,the stiffness of the elastic support of the wind turbine generator should be greater than 4000N/mm.

Why is elastic support important for wind turbine vibration reduction?

As the installed capacity of wind power continues to increase and the operating time of wind turbine increases,problems related to vibration have become more prominent. Therefore,the selection of elastic support as key components of the vibration reduction system is particularly important.

How to select the elastic support of a generator?

When selecting the elastic support of the generator, the X (axial), Y (lateral), and Z(vertical) stiffness are mainly considered to match the rationality of the system. Without considering the flexibility of the rear frame, the The Authors, published by EDP Sciences.

How does Abaqus improve the stiffness of a wind turbine?

It has a certain reliability,and greatly simplifies the selection of the elastic support of the wind turbine. Secondly,the DOE method is used to analyze the sensitivity of the wind turbine's elastic support stiffness by the integration of ABAQUS and Isight software. Finally,the stiffness is optimized by algorithm.

What is the torsional frequency of a wind farm generator?

According to formulas 1,the torsional frequency around Z axis is 26.19Hzwhich causes the current excessive vibration of the generator in the wind farm. The generator system mainly includes three components which are generator,elastic support and rear frame.

A fully coupled hydro-servo-aero-elastic simulator for the analysis of floating offshore wind turbines (FOWTs) is presented. All physical aspects are addressed, and the corresponding ...

This study centered on the elastic support of the generator in a 7 MW wind turbine, with a specific focus on conducting physical tests to measure its bidirectional static stiffness. To determine the rated load that each wind ...

effects of the elastic support on the dynamics of the wind turbine drive train must be elucidated to improve the reliability and service life of wind turbines. Recent studies on the dynamic ...

To test the static sti ness of the elastic support for a wind turbine generator, a micro- computer-controlled electro-hydraulic servo rubber testing machine, of model WXJ.200 ...

Seidel, M. (2018), Tolerance requirements for flange connections in wind turbine support structures. ... (elastic / plastic) In order to estimate the meridional shell (tower wall) stiffness, a ...

- wind turbine generator is considered to act statically on the support pillar, the mechanical model being in the form of a concentrated force acting at the free end of the structure. In this paper ...

The findings of this study provide the foundation for optimizing the elastic support stiffness of the wind turbine drive train. The reliability and service life of wind turbines are ...

The elastic response of wind turbines blades and towers is. ... for floating wind turbines support structures. Energy Procedia. 137:177-185. Carbon Trust (2015) Floating offshore wind: market ...

In recent years, the rapid development of the offshore wind industry has been attracting increasing worldwide attention [1].Currently, offshore wind turbines can be classified ...

Results showed that the elastic support parameters considerably influenced the dynamic behaviors of the wind turbine drive train. A large support stiffness of the torque arms ...

An efficient reliability-based design optimization method for the support structures of monopile offshore wind turbines is proposed herein. First, parametric finite element analysis ...

Results showed that the elastic support parameters considerably influenced the dynamic behaviors of the wind turbine drive train. A large support stiffness of the torque arms decreased...

The vibration system of wind turbine doubly-fed induction generator (DFIG) includes generator, elastic support and frame. The work in this paper was conceived to test whether the elastic ...

1 A fracture mechanics framework for optimising design and 2 inspection of offshore Wind Turbine support structures against 3 fatigue failure 4 Peyman Amirafshari1, Feargal Brennan1, ...

vibration acceleration and the structural noise of the wind turbine gearbox were lowered after suitable tooth modification. Keywords: Wind turbine gearbox; Elastic supporting; Gear...

The wind turbine drive train is a key component of wind turbines, and the performance of the former is

responsible for the reliability and service life of the latter. An elastic support condition ...

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