

Solar Energy South Africa

Working status of wind turbine generator set



Overview

What is a wind turbine generator failure analysis & fault diagnosis?

In this article, a comprehensive and up-to-date review of wind turbine generators failure analysis and fault diagnosis are presented. First, the electrical and mechanical failures of various WTG components, including stator, rotor, air gap, and bearings, are analyzed. Then, the fault characteristics and root causes of WTG are studied.

How many variables does a wind farm have?

The dataset contains 312 analogous variables recorded at 5-minute intervals by the wind farm's SCADA, from 78 different sensors. Wind turbines consist of nine main systems, namely Converter, Generator, Nacelle, Rotor, Tower, Transformer, Transmission, Turbine, and Yaw. Some of these systems are further divided into specific subsystems.

How can a healthy wind turbine be a reference space?

Historical SCADA data collected from healthy wind turbines are used to model their normal behaviors and build a Mahalanobis space as a reference space. By comparing the predicted behavior of the wind turbine by a trained model with the reference space, anomalies can be detected.

How to improve the reliability of a large-scale wind farm?

To improve the reliability and optimize the maintenance strategy of a large-scale wind farm, a health condition assessment method of wind turbine generator system (WTGS) based on multiple turbines cooperation is presented in this paper.

What are the common faults of a wind turbine generator?

Common faults of wind turbine generator. Generator electrical faults are mainly stator eccentricity, rotor eccentricity, broken rotor bars, and looseness. The main manifestations of generator stator faults are overheating of stator

windings, insulation damage, and grounding.

How do we detect wind turbine faults?

By comparing the predicted behavior of the wind turbine by a trained model with the reference space, anomalies can be detected. Finally, wind turbine faults are diagnosed through the analysis of the distributions and correlations of their SCADA data. The proposed approach is validated by using the SCADA data collected from two field wind turbines.

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The Ultimate Guide To Vertical Axis Wind Turbines

Definition and overview of Vertical Axis Wind Turbines (VAWTs) The overview and definition of VAWTs can help us understand how these turbines function. A vertical-axis wind turbine (VAWT) is a type of wind turbine ...

Wind turbine generator failure analysis and fault ...

In this article, a comprehensive and up-to-date review of wind turbine generators failure analysis and fault diagnosis are presented. First, the electrical and mechanical failures of various WTG components, including ...



ESS



Online condition monitoring and fault diagnosis in wind turbines: ...

5 ???· In many countries, wind turbines have proven themselves to be a great solution as renewable energy [1]. Though there are other resources of renewable energy which involves ...

(PDF) Fault Prediction and Diagnosis of Wind Turbine ...

The proposed solution can: (1) predict the remaining useful life (RUL) of wind turbine generators before a fault occurs and (2) diagnose

the state of the wind turbine generator when the fault occurs.



Performance Evaluation of Grid-Connected Wind ...

The risk of oscillation of grid-connected wind turbine generators (WTGs) is well known, making it all the more important to understand the characteristics of different WTGs and analyze their performance so that ...

Health condition assessment of wind turbine ...

As the running time of a wind turbine generator unit (WTGU) increases, the ageing and wear of its components will be aggravated gradually, which leads to deterioration of its operation condition. In order to ensure the ...



Wind Power Plant: Diagram, Parts, Working

Working of Wind Power Plant. The wind turbines or wind generators use the power of the wind which they turn into electricity. The speed of the wind turns the blades of a rotor (between 10 and 25 turns per minute), a ...

A health condition assessment method of wind turbine ...

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