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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 35854-2018

**Mechanical vibration measurement and evaluation for the wind
turbines and their components**

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2015 chapter numbering control list.

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard uses the redrafted law to amend ISO 10816-21.2015 "Mechanical vibration through non-rotating part measurement and evaluation machines

Mechanical Vibration Part 21. Horizontal Axis Wind Turbine with Gearbox.

Compared with ISO 10816-21.2015, this standard has more structural adjustments.

Appendix A lists this standard and ISO 10816-21.

2015 chapter numbering control list.

There is a technical difference between this standard and ISO 10816-21.2015. The terms involved in these differences have passed the margin on the outside of the page.

The vertical single line (|) of the white position is marked, and Appendix B gives a list of the corresponding technical differences and their causes.

This standard has made the following editorial changes.

--- Modify the standard name "Measurement and evaluation of mechanical vibration of wind turbine and its components".

This standard is proposed by China Machinery Industry Federation.

This standard is under the jurisdiction of the National Wind Machinery Standardization Technical Committee (SAC/TC50).

This standard was drafted by. Xinjiang Goldwind Science and Technology Co., Ltd., Beijing Jinfeng Kechuang Wind Power Equipment Co., Ltd., Gemeiyu Wind Power (days

(Jin) Co., Ltd., Beijing Jinfeng Huieng Technology Co., Ltd., Xinjiang University, School of Electrical Engineering, Xinjiang University Graduate School, Beijing Tiancheng Tongchuang

Electric Co., Ltd.

Introduction

The wind velocity field has turbulent flow, shear and other random non-stationary factors, leading to wind turbines subjected to complex aerodynamic loads; wind power generation

The unit is a typical variable condition mechanical equipment, so it is subject to inertial forces and other additional loads caused by changing conditions; wind turbine with gear box

The transmission chain of the group consists of a series of components that interact with each other, affect, and may generate a source of load excitation, such as. misalignment can cause gearing

Intermeshing vibrations may cause resonance of the drive train. In short, the external non-stationary excitation superposition variable condition operation will result in wind turbines and transmissions.

The entire wind turbine, including the chain, tower, and foundation, is subjected to complex dynamic loads, which can cause vibration of the whole wind turbine or assembly.

And showing complex features.

Based on the special structure and complex vibration characteristics of wind turbines, it is currently suitable for evaluating the vibration of buildings and other mechanical equipment.

The standard does not apply to wind turbines.

The vibration of wind turbines will have a huge impact on the reliability and life of components and components, so wind turbine generator manufacturers and operators

Business, insurance companies, and service companies all have requirements for the assessment of mechanical vibration measurement of wind turbines and their components.

The purpose of this standard is to regulate the method of measurement of mechanical vibration of wind turbines and their components and to assist in the operation of wind turbines.

Evaluation. Once the evaluation parameter exceeds the limit, the measurement result should give the conclusion that the entire wind turbine unit or component is dangerous, but it cannot give

Causes of excessive vibration; evaluation parameters do not exceed the limit, it is generally believed that the wind turbine operating conditions are normal, but can not absolutely rule out the wind

There is a possibility of damage to the entire unit or component of the generating unit.

Wind turbine and its components mechanical vibration

Measurement and evaluation

1 Scope

This standard specifies the conditions and methods for measuring and evaluating the mechanical vibration of wind turbines and their components.

This standard applies to wind turbines with rated power greater than 200 kW and having the following structural and operating characteristics.

- Support structure consisting of steel tower and concrete foundation;
- Horizontal axis, multiple blades;
- The main bearing is independent or integrated in the gear box;
- The generator is driven by a gearbox or directly driven by a rotor;
- Synchronous generator or asynchronous generator;
- A fixed number of pole generators or a variable pole generator for speed adjustment;
- Output control through pitch or stall;
- The generator is connected to the grid via a converter or directly accessed;
- Active yaw system to maintain the same direction as the wind direction of the engine room.

This standard does not apply to the factory test of gearboxes and generators.

This standard does not apply to the evaluation of the torsional vibration state of the main bearings and gearboxes on the drive train.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article

Pieces. For undated references, the latest version (including all amendments) applies to this document.

GB/T 6075.1-2012 Mechanical vibration measurement on non-rotating parts Evaluation of machine vibration Part 1. General

(ISO 10816-1:1995, IDT)

GB/T 6075.3-2011 Mechanical vibration measurement on non-rotating parts Evaluation of machine vibration Part 3. Large rated power

Industrial machinery for in-situ measurement at 15 kW nominal speeds from 120 r/min to

15000 r/min (ISO 10816-3:2009,

IDT)

GB/T 14412-2005 Mechanical installation of mechanical vibration and impact accelerometers (ISO 5348:1998, IDT)

GB/T 18451.1-2012 Design Requirements for Wind Turbines (IEC 61400-1:2005, IDT)

GB/T 19873.1-2005 Machine condition monitoring and diagnostic vibration condition monitoring Part 1. General (ISO 13373-1:

2002, IDT)

NB/T 31004-2011 Guidelines for vibration condition monitoring of wind turbines

3 Terms and Definitions

The terms and definitions defined in GB/T 18451.1-2012 and the following apply to this document.

3.1

Acceleration evaluation parameters assessment acceleration parameters

A_{w0}

The effective value of acceleration in a given frequency band measured over a period of time.