Wind power generation excitation principle

What are the operating states of double rotor speed-regulating wind power generation system?
Five operating states of the double rotor speed-regulating wind power generation system are as follows: The inner rotor of the speed-regulating generator coaxially connected with the rotor of the synchronous generator is equivalent to a stator because the synchronous generator is not connected with the power grid.

What is double rotor speed regulating wind power generation system?
The double rotor speed-regulating wind power generation system has the ability of speed regulation and power generation at the same time in a certain period of time and reduces the capacity of the generator and converter as a new type of driving chain of speed-regulating wind turbine.

How does wind speed affect the output power of a speed regulating generator?
The outer rotor speed nout of the speed-regulating generator increasesfrom zero with the rise of wind speed v since the wind speed reaches cut in value vin,and the output power of the speed-regulating generator to the power grid is Pf.

Is double rotor without stator wind turbine generation system feasible?
The performance of the proposed double rotor without stator wind turbine generation system and the traditional wind turbine are compared. Theoretical analysis and multi condition simulation results show that the double rotor without stator wind turbine generation system proposed in this paper is feasible and effective.

What is a speed regulating wind turbine?
The existing speed regulating wind turbines are mainly based on differential gearbox, hydraulic transmission, continuously variable transmission and electromagnetic coupler. The speed regulation wind turbine realizes the flexible connection of the drive chain and alleviates the impact load to a certain extent.

How does wind speed affect output power?
The outer rotor speed nout has already reached the rated value noutN since the wind speed exceeds v?N,whereas the output power Pf of the speed-regulating generator has not reached the rated value PfN; thus,the output power Pf continues to increaseas the wind speed rises while the outer rotor speed keeps stable.

Introduction. In wind energy application, the Doubly Fed Induction Generator (DFIG) has a major advantage because its power converters require only 20-30% of the machine rating, for interfacing the rotor and the ...

Currently, many scholars have fully studied the internal and external excitation of the mechanical parts in wind turbine main drive systems. Zhou et al. 5 considered the gear ...

The synchronous generator is the most essential equipment in electrical energy generation. This chapter

provides a history of the synchronous generator from the beginning until the present. ...

A novel synchronous generator is proposed for wind power generation. The field flux is generated by the half-wave rectified excitation method. The generator does not require slip rings and brushes for field power ...

What is a Wind Power Plant? A wind power plant is also known as a wind farm or wind turbine. A wind power plant is a renewable source of electrical energy. The wind turbine is designed to use the speed and power of wind and convert it ...

Wind power generation systems produce electricity by using wind power to drive an electric machine/generator. The basic configuration of a typical wind power generation system is depicted in Figure 2. Aerodynamically ...

It involves establishing a mathematical model of the dual stator-winding wind turbine and proposing an excitation start-up method for the generator. The study begins by describing the ...

With the continuous increase in wind power penetration, doubly fed wind turbines can quickly respond to changes in grid frequency, and have particularly important inertia ...

Offshore wind is renewable, clean, and widely distributed. Therefore, the utilization of offshore wind power can potentially satisfy the increasing energy demand and circumvent the dependence on fossil energy. ...

Key words: Dual stator-winding induction generator (DWIG), Excitation-capacitor optimization, Grid connection, Wind power, Wide wind speed I. INTRODUCTION Since the beginning of the ...

range required to exploit typical wind resources. An AC-DC-AC converter is included in the induction generator rotor circuit. The power electronic converters need only be rated to ha ndle ...

It is used to provide the power for the excitation of the high-rating synchronous generator. During the short circuit, these generators provide the power to the generator connected in the system to maintain the required ...

Figure 4 shows a 40 kW (medium-size) three-phase induction generator for a wind turbine. The generator is 0.7 m long. The stator coils are the armature coils on an induction generator, and the ends of these coils are connected to ...

The control of variable speed constant frequency (VSCF) for a wind power generation system is implemented by controlling the frequency, amplitude, phase angle and sequence of the rotor ...

Industrially, doubly fed induction generators usually use a conventional vector control method. This method is based on the principle of vector orientation and decouples the three-phase ...

Wind power generation excitation principle

This paper proposes a novel hybrid excited generator, which is suitable for a variable-speed wind power generation system. Two sets of excitation sources are employed, which are permanent ...

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