

Which machine is suitable for direct-drive wind power generation?

In this machine, voltage and frequency of the outer windings are controlled in accordance to speed of the rotor, which is dependent on wind speed. Hence, with the low-speed operation feature of magnetic-gearing machines, this machine is particularly suitable for direct-drive wind power generation.

What are the topologies of electric machines for wind power generation?

Various novel topologies of electric machines for wind power generation have been developed. In [1], Beik and Schofield presented a hybrid excited machine, which combines wound field and PM rotor excitations, as shown in Figure 23 (a). This is a high-voltage generator with 6.87-kV RMS phase at 600 r/min.

What are the different types of wind turbine generation systems?

Two typical configurations of power electronic converter-based wind turbine generation systems have been widely adopted in modern wind power applications: type 3 wind generation systems with doubly fed induction generators (DFIGs) (Fig. 2a); and type 4 wind generation systems with permanent magnet synchronous generators (PMSGs) (Fig. 2b).

What is a wave-hydraulic wind turbine?

Schematic diagram of wave-hydraulic wind turbine. Combined with hydraulic energy storage system, Simpson proposed a new over-fixed wind turbine control method that allows the rotor to generate additional power beyond the rated power limit and store the additional power for later regeneration.

Are electric machines and drives suitable for wind power generation?

This paper has presented a comprehensive review of electric machines and drives for wind power generation in terms of challenges and opportunities. Compared to conventional electric machines for wind power generation, including SCIMs, WRIMs, DFIMs, and EESMs, PMSMs are regarded as the most promising candidate.

How does a wind power generation system work?

Traditional wind power generation technology uses a rotor to transmit wind energy to a gearbox and then to a generator to generate electricity[1,2]. The engine room is equipped with turbines, transmission systems, gear boxes and generators, which are very heavy, and the tower must have high strength.

The radial flux generators are commonly used for electric power generators, such as the wind, geothermal and thermal turbines and nuclear plants [16] [17][18]. Although ...

An analytical method for the sizing and siting of distributed generators in radial systems Electric Power Systems Research An analytical method for the sizing and siting of ...

3.3 Offshore wind-power plant configurations. Another feature of the DC collection grid that must be considered is the configuration of the offshore wind-power plant itself. Typical configurations of the wind farm with DC ...

This research proposes a strategy to minimize the active power loss in the standard IEEE 85-node radial distribution power grid by optimizing the placement of wind turbines in the grid. The osprey optimization algorithm ...

distribution. Because of the advancement in power electronics, wind energy in electrical power generation is on the rise when compared to other energy technologies worldwide. The Wind ...

New applications have also emerged in distributed generation systems (wind turbine generators, high-speed micro turbine generators), miniature power supplies, flywheel ...

Besides conventional radial-flux machines, non-radial-flux machines, i.e. axial-flux machines and transverse-flux machines are gaining interests for wind power generation due to their advantages of short axial ...

Cylindrical and elliptical bore profiles are the most common fixed geometry designs used in power generation machinery (Fig. 5).The cylindrical bore illustrated in Fig. 5a is the simplest design ...

The PM-excited radial flux generator powered by a wind turbine is still a custom-built technology. Market share limiting issues such as cost and mass may be solved by generator component/subassembly standardization. ...

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