Wind power asynchronous generator

How does a 3 phase asynchronous wind turbine generator work?

Figure 4 shows a full Simulink model of a three-phase asynchronous wind turbine generator. The Basic Turbine block uses a simple output power vs wind speed characteristic to translate wind speed to turbine output power. The machine creates no real power when the wind speed is below the cut-in speed or above the cutout speed.

How much power does an asynchronous wind turbine produce?

As the asynchronous machine operates in generator mode,its speed is slightly above the synchronous speed (1.011 pu). According to turbine characteristics,for a 10 m/s wind speed,the turbine output power is 0.75 pu (206 kW). Because of the asynchronous machine losses,the wind turbine produces 200 kW.

What is an example of a synchronous generator?

For the example, the wind speed (10m/s) is such that the wind turbine produces enough power to supply the load. The diesel generator (not simulated) is stopped and the synchronous machine operates as a synchronous condenser with its mechanical power input (Pm) set at zero.

What is a modern induction generator wind power system?

The core component of a modern induction generator wind power system is the turbine nacelle,which generally accommodates the mechanisms,generator,power electronics,and control cabinet. The mechanisms,including yaw systems,shaft,and gear box,etc.,facilitate necessary mechanical support to various dynamic behavior of the turbine.

How does a synchronous generator work?

The diesel generator (not simulated) is stopped and the synchronous machine operates as a synchronous condenser with its mechanical power input (Pm) set at zero. The example illustrates the dynamic performance of the frequency regulation system when an additional 25 kW customer load is switched on.

Are synchronous generators a proven machine technology?

Synchronous generators are a proven machine technologysince their performance for power generation has been studied and widely accepted for a long time. A cutaway diagram of a conventional synchronous generator is shown in Fig. 7.

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