



Power Conditioning Architecture for Wind Turbine

[View U.S. Patent No. 7,919,879 in PDF format.](#)

WARF: P06426US

Inventors: Venkata Giri Venkataramanan, Patrick Flannery

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method that allows DFIG wind turbines connected to the utility grid to ride through a voltage sag.

Overview

Wind-powered generators are an increasing source of power for many countries. However, before their use can become widespread, they must be able to work effectively with the existing utility grid.

Voltage sags and other disturbances can occur during grid faults. But the conventional electrical architecture for doubly fed induction generator (DFIG) wind turbines fails during extreme voltage sags, and existing patchwork solutions are not effective or economical.

The Invention

UW-Madison researchers have developed a viable solution that allows DFIG wind turbines connected to the grid to ride through a voltage sag. The turbines need converters, such as a DC/AC inverter, to change the power generated into a form that is compatible with the utility grid. In a conventional DFIG wind turbine, the grid-side converter is connected in parallel with the stator windings of the generator. This approach has the converter connected in series instead. The DC voltage bus of the converter is fed from the induction generator rotor windings through a second, machine-side converter. Connecting the grid-side converter in series allows continuous control of shaft torque and power delivered to the grid even during grid faults, enabling inherent voltage sag ride-through capability.

Applications

- Wind-powered generators

Key Benefits

- Maintains connection to the grid and control of torque and current, even during grid faults
- Enables wind turbine power generation to conform to utility system operating requirements
- Allows wind turbine generators to effectively interface with the utility grid
- Operation of both converters is coordinated to control wind turbine rotor speed for maximum power extraction and efficiency.

Additional Information

For More Information About the Inventors

- [Venkata Giri Venkataramanan](#)

We use cookies on this site to enhance your experience and improve our marketing efforts. By continuing to browse without changing your browser settings to block or delete cookies, you agree to the storing of cookies and related technologies on your device. [See our privacy policy.](#)

- [Clean Technology : Solar, wind & water technologies](#)
- [Engineering : Power electronics & control systems](#)

OK



WARF
Wisconsin Alumni Research Foundation

| info@warf.org | 608.960.9850

For current licensing status, please contact Michael Carey at mcarey@warf.org or 608-960-9867

We use cookies on this site to enhance your experience and improve our marketing efforts. By continuing to browse without changing your browser settings to block or delete cookies, you agree to the storing of cookies and related technologies on your device. [See our privacy policy.](#)

OK