

Low voltage ride-thru technology



imagination at work



Performance at the highest level.

Steinfurt, Germany
11 x 1.5s
total capacity: 16.5 MW

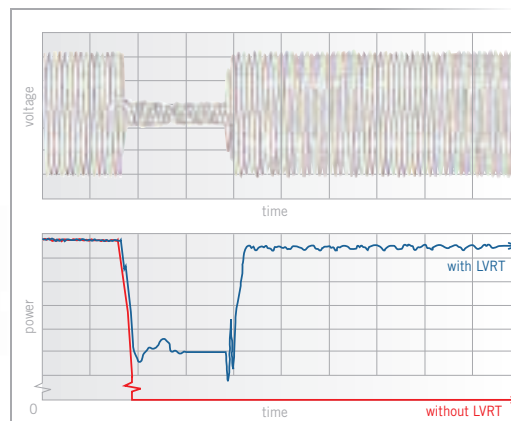
GE has just taken wind power electronics to the next level of performance. Wind turbines can now, for the first time, remain on-line and feed reactive power to the electric grid right through major system disturbances. GE's innovative Low Voltage Ride-Thru (LVRT) feature enables wind turbines to meet transmission reliability standards similar to those demanded of thermal generators. LVRT adds significant new resiliency to wind farm operations, just at the time when more utilities are requesting it.

Providing service – all the time.

Providing truly uninterrupted service has grown in importance as wind farms increase in size and command a larger share of the power industry's supply portfolio. Transmission "system events" – lightning strikes, equipment failures, and downed power lines – are a fact of life on utility grids around the world. Transmission planners expect generators to cope with and, ideally, help recover from system events. Wind turbines have had, until now, a single response to these instantaneous voltage drops: they trip off line, protecting their functions until the grid recovers. LVRT renders this over-sensitive response obsolete. By improving the generator/control design, LVRT maintains high availability while demonstrating that wind power can join the grid as a "good neighbor."

Bringing benefit to the grid.

The unique Wind Volt-Amp-Reactive ("WindVAR") designed into GE's wind turbines routinely benefits rural and more isolated grids by maintaining system stability, reducing the risk of voltage collapse, and minimizing the impact of grid disruptions. LVRT enhances this feature by keeping wind farms on-line by feeding reactive power during system events. LVRT is added evidence to transmission planners and grid operators that wind farms are problem solvers.



Before GE's LVRT technology, wind turbines would trip offline on any voltage sag below 70%. Now, we have designed them to ride through very severe grid disturbances, as illustrated by the test graphs (left).



Heede, Germany
11 x 1.5s,
total capacity: 16.5 MW



Desert Sky, USA
107 x 1.5s
total capacity: 160.5 MW



Trent Mesa, USA
100 x 1.5s,
total capacity: 150 MW

Elegant addition.

GE's innovative LVRT technology is an elegant addition to an already cutting edge power electronics control technology. This groundbreaking feature is the result of collaborative work by numerous professionals across multiple GE businesses, who together designed and tested the LVRT wind turbine control systems. The new feature is compatible with all other on-board components and can be programmed to align with the operational / control parameters of the host transmission system. Packages for the 1.5 MW turbine are currently available that deliver ride-thru capability down to 30% voltage at the point of common coupling for 100 milliseconds - providing support to bring the system back to normal operating conditions.

A final word.

LVRT is a compelling example of how GE continues to pioneer on-board transmission services. Project sponsors work hard to create successful wind farms – LVRT will help improve their prospects for success.

GE Energy

GE Energy is one of the world's leading suppliers of power generation and energy delivery technology. We provide our customers with equipment, service and management solutions across the power generation, oil and gas, transmission and distribution, distributed power and energy rental industries.

As one of the world's leading wind turbine suppliers, our current product portfolio includes wind turbines with rated capacities ranging from 1,500 to 3,600 kilowatts and support services reaching from development assistance to operation and maintenance. We currently design and produce wind turbines in Germany, Spain and the U.S. In Florida, USA, we also manufacture advanced wind turbine blades to assure the highest quality, advanced designs and quick on-time delivery.

Our facilities are registered to ISO 9001:2000. Our Quality Management System, which incorporates our rigorous Six Sigma methodologies, provides you with quality assurance backed by the strength of GE. We know that wind power will be an integral part of the world energy mix in this century and we are committed to helping our customers design and implement energy solutions for their unique energy needs. Every relationship we pursue bears our uncompromising commitment to quality and innovation.

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