



Terra-Gen LLC

Controller retrofit increases power productivity by 2%



The independent power producer Terra-Gen, LLC frequently experienced downtime with its Vestas V47* wind turbines on the high-wind site at Pacific Crest, Mojave, California. A DEIF control retrofit solution did not only decrease downtime; it also improved turbine performance with 2% over six months.

Terra-Gen, LLC struggled with repetitive VRCC-related failures. In the end, the power producer lost faith in the original control setup and decided to find an experienced retrofit partner. Terra-Gen chose to go with DEIF as the Danish company's control solution could substitute the VRCC unit.

Based on thorough analysis and matching of expectations, the team from DEIF presented a business

case that not only would optimize the turbines' performance but also make Terra-Gen, LLC independent in terms of VRCC related costs such as spare parts, lost production due to downtime and derating. Terra-Gen LLC expected to see a positive return on investment within three years. Still, only after six months, the power producer notes that productivity has increased by 2%, and the wind farm owner is confident about the investment.

Based on turbine data, we are calculating if it would be more profitable to replace VRCC power units with DEIF's solution. We are impressed by the current results, and we will not dismiss the idea of choosing DEIF to retrofit more of our V47 turbines

Ward Scobee, Senior Vice President, Terra-Gen, LLC.



Removing the VRCC smoothens cut in and cut out

A VRCC power module is expensive, and Terra-Gen LLC often experienced failures that led to additional costly downtime. When a VRCC failure occurs, the Vestas V47 turbine is programmed to derate to 300kW automatically. That is 360kW less than the rated power output, something that impacts both turbine AEP and bottom line negatively.

DEIF's control solution for V47 is normally limited to an output of 600kW running without the VRCC, but Terra-Gen LLC wanted a solution with no decrease in output. So, the turbines have to run with a maximum 660kW without the VRCC unit.

DEIF met the challenge and developed the Adaptive Power Setpoint technology. The feature smoothens cut in and cut out and increases turbine productivity as max output is reached faster to minimize production loss and without further impact on turbine drivetrain and enables a more efficient turbine operation. Terra-Gen, LLC benefits from an increased availability factor due to advanced derating features, more efficient pitch and yaw algorithms and optimized basic turbine procedures. Basically, Terra-Gen, LLC increases revenue and decreases operation costs significantly.

“We strive to run our turbines efficiently – at the lowest cost. The Pacific Crest Wind Farm is a high wind site, and the cost of downtime is critical. So, having reduced downtime and increased productivity with 2% in only six months tells me that we were right to go with DEIF.”

Ward Scobee - Senior Vice President, Terra-Gen, LLC.

Calculations based on qualified data

Besides having improved its turbines' AEP, Terra-Gen also benefits from improved availability and free data access. The retrofitted turbines are available for monitoring 24-7 to secure production and the increased access to qualified turbine data has enabled Terra-Gen to make a thorough analysis and calculate the business potential. Throughout the whole process, DEIF's team of experts from Denmark and Austria has been at Terra-Gen's disposal 24/7, meaning that questions and uncertainties have been handled right away, making the process progress efficiently.



Performance optimization & lifetime extension

The increased demand for competitive power production and the rapid development in the wind industry necessitates that older turbine models such as the Vestas V47 are equipped to meet today's performance standards. DEIF's control retrofit solution extends the turbine lifetime and optimizes the turbine performance

in terms of variable speed concepts, extended cut-out and Adaptive Power Output. The results from the Pacific Crest site are so convincing that Terra-Gen considers replacing obsolete VRCC units with DEIF's control solution on all its turbines.

“Our team works closely together with DEIF, and through 24/7 monitoring, we get data that we have not been able to get from our old setup. This enables us to ensure a better maintenance strategy which again saves us both work and money.”

Dean Landon, VP - Wind Operations, Terra-Gen, LLC.

“This project is a class example of a partnership, and cooperating with the Terra-Gen team at Pacific Crest has been a true pleasure. Both teams have been chasing the same goal, and succeeded in the best possible way. Validation and monitoring have proved that we are on the right track, and we are looking forward to continuing the cooperation with Terra-Gen and partners.”

Jean S. Felber, Business Development Manager, DEIF A/S

DEIF A/S

Frisenborgvej 33, 7800 Skive, Denmark
Tel. +45 9614 9614

Learn more at www.deif.com



We're pretty social too

