

Wind Turbine Development Program

Case Study: New World Generation

1.5 MW
Wind Turbine Series



SUMMARY

Industry

- Energy

Customer Location

- Owen Sound, Canada

Business Situation

- NWG has developed a new technology for generating power, and introduced the technology to a manufacturer. There was interest in developing the idea further for the manufacturer's 1.5MW turbine.

Technical Situation

- NWG does not have an in-house engineering staff that can engineer and manage the development process to adapt its technology to the customer's 1.5MW turbine.

Solution

- NLS reviewed current wind turbine generator and gearbox design
- Performed power and general design calculations and upgraded to 1.5 MW turbine space requirements
- Facilitated technical response to customer

Benefits

- NLS provided credible engineering details and confirmed how the new design would reduce downtime and increase power generation by upgrading
- Basic cost analysis

Solutions / Services

- Project management services
- Structural analysis and simulation services
- Design engineering services

Company Overview

New World Generation (NWG) is a privately held Canadian company based in Owen Sound, Canada. It has been in operation since 2001. NWG works in the energy sector and specializes in collecting, generating, storing and regenerating electrical energy. NWG has two wholly owned subsidiary companies: ThermaENERGY Systems Inc. and CWind. The company has invested heavily in developing new wind turbine generation technology, to include innovative direct drive generators that do not require problematic gearboxes that have been a reliability issue in the wind turbine industry.

Situation

NWG was given an opportunity to supply their innovative direct drive generator system to a large wind turbine manufacturer as an upgrade package during a gearbox repair/replacement program. They were faced with the issue that their current team did not have the in-house engineering talent to lead a large complex engineering evaluation for such a large manufacturer. NWG needed highly trained and skilled engineering support that could work on the project immediately and provide a credible engineering presence and link between NWG and their customer. They needed Northern Lights Solutions.

Project Management

This was a complex project involving many different people in various functional groups, organizations, and in two countries. NLS had the responsibility of organizing all involved parties and then creating an efficient plan to make sure the development continued on time and within budget.

Design Engineering Services

Making sure the drive system technology would physically fit into their customer's wind turbine was a big deal. NLS had to work with the current NWG product and quickly rework the design into a new package that would fit seamlessly into the existing wind turbine design. To meet the tight timeline and budget restrictions, NLS used its direct modeling program to create new design options for review. The main idea here was to test several designs as quickly as possible before a final concept was settled upon. Once a design was selected for more in depth development, more traditional 3D parametric modeling was used to get the details absolutely perfect.

Simulation and Analysis Services

Having a design that worked didn't matter if it was not capable of creating the right power and not over-stressing the current structure. In a mixture of old fashioned hand calculations and structural analysis using the latest in Finite Element Analysis (FEA) software, NLS validated that the new NWG design would generate the right power and would not fall down.

Results

In spite of the complexity, in four weeks, a new design was developed, tested, and confirmed for generating power for a retrofit program into an existing 1.5MW wind turbine. Having the ability to do R&D in this kind of time frame, and with low costs, is a tremendous advantage for companies like New World Generation.



“NLS saved us time and money, and their expertise brought this project together brilliantly within our short timeframe.”

— Paula Mayor, Director, NWG

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