



Cooperation on Lidar for Improved Wind Turbine Performance

Cooperative Research and Development Final Report

CRADA Number: CRD-13-521

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In accordance with Requirements set forth in Article XI, A(3) of the CRADA document, this document is the final CRADA report, including a list of Subject Inventions, to be forwarded to the Office of Science and Technical Information as part of the commitment to the public to demonstrate results of federally funded research.

Parties to the Agreement: Avent Lidar Technology & NRG Systems

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CRADA Title: Cooperation on Lidar for Improved Wind Turbine Performance

Joint Work Statement Funding Table Showing DOE Commitment:

| Estimated Costs | NREL Shared Resources |
|------------------------|------------------------------|
| Year 1 | \$ 64,777.00 |
| Year 2 | \$ 86,442.00 |
| TOTALS | \$ 151,219.00 |

Abstract of CRADA Work:

Research into the use of lidar for improved wind turbine performance is an area of considerable interest. Lidars have been proposed to analyze and improve wind turbine pitch control performance, yaw alignment and control performance, as well as to improve power curve assessments. In this CRADA, NREL, NRG Systems, Inc. (“NRG”) and Avent Lidar Technology SAS (“Avent”) will collaborate on testing these concepts.

Summary of Research Results:

A nacelle-mounted lidar was used to improve the yaw alignment of an experimental wind turbine. Using lidar-recorded data during normal operation, an error correction value for the nacelle vane wind direction measurement used in the yaw controller was determined. A field test was then conducted in which the turbine was operated with and without the correction applied to the yaw controller. Results demonstrated a significant increase in power capture. In addition, the study includes analysis on the impacts on loading of applying this yaw correction. The study demonstrates a successful application in field testing of using a nacelle-mounted lidar to improve turbine performance.

Subject Inventions Listing: None

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