NREL
NATIONAL RENEWABLE ENERGY LABORATORY

Dynamometer Testing of a NW2200 Drivetrain

Cooperative Research and Development Final Report

CRADA Number: CRD-10-394

NREL Technical Contact: Robb Wallen

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

CRADA Report
NREL/TP-7A10-53456
April 2012

Contract No. DE-AC36-08GO28308

NOTICE

Available electronically at http://www.osti.gov/bridge

Available for a processing fee to U.S. Department of Energy
and its contractors, in paper, from:

U.S. Department of Energy
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831-0062
phone: 865.576.8401
fax: 865.576.5728
email: mailto:reports@adonis.osti.gov

Available for sale to the public, in paper, from:

U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
phone: 800.553.6847
fax: 703.605.6900
email: orders@ntis.fedworld.gov
online ordering: http://www.ntis.gov/help/ordermethods.aspx

Cover Photos: (left to right) PIX 16416, PIX 17423, PIX 16560, PIX 17613, PIX 17436, PIX 17721

Printed on paper containing at least 50% wastepaper, including 10% post consumer waste.

Cooperative Research and Development Final Report

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.

CRADA number: CRD-10-394

CRADA Title: Dynamometer Testing of a NW2200 Drivetrain

Parties to the Agreement: Northern Power Systems

Joint Work Statement Funding Table showing DOE commitment:

Estimated Costs	**NREL** Shared Resources
Year 1	$ 00.00
Year 2	$ 00.00
Year 3	$ 00.00
TOTALS	$ 00.00

Abstract of CRADA work: Northern Power Systems specializes in direct drive wind turbine designs. CRADA CRD-10-394 involved testing the NW2200 wind turbine power train.

Power train testing is important because it allows validation of the generator design and some control algorithms prior to installation on a tower, where this data would be more difficult and time consuming to collect. In an effort to keep the commercial product schedule on time, Northern Power requested testing support from the National Renewable Energy Laboratory for this testing. The test program was performed using NREL's 2.5 MW dynamometer test bed at the National Wind Technology Center near Boulder, CO.

Summary of Research Results: Northern Power Systems collaborated with National Wind Technology Center (NWTC) engineers to test a prototype 2.3MW direct-drive turbine at the 2.5MW dynamometer facility under NREL CRADA CRD-10-394. Testing of the system began early in October, 2010 and concluded at the end of April, 2011. The NWTC dynamometer facility's unique capabilities allowed NPS to conduct a variety of valuable tests over a short period of time. The capabilities of the dynamometer facility allowed NPS to bring all of the critical elements of their turbine for testing, including all up-tower components except those replaced by the dynamometer – the hub and blades. A comprehensive test plan allowed NPS to risk-reduce a field deployment and accelerate commercialization through systems testing, powertrain characterization and controls tuning.

The technology demonstrator that was the basis for the NPS generator now under test was originally developed and tested under NREL's Wind Partnership for Advanced Component Technologies (WindPACT) and Low Wind Speed Technology (LWST) programs.

A detailed test report has been supplied to Northern Power Systems under NREL Management Report MP-5000-52587.

Subject Inventions listing: N/A

Report Date: 8/17/2011 Responsible Technical Contact at Alliance/NREL: Robb Wallen

This document contains NO confidential, protectable, or proprietary information.