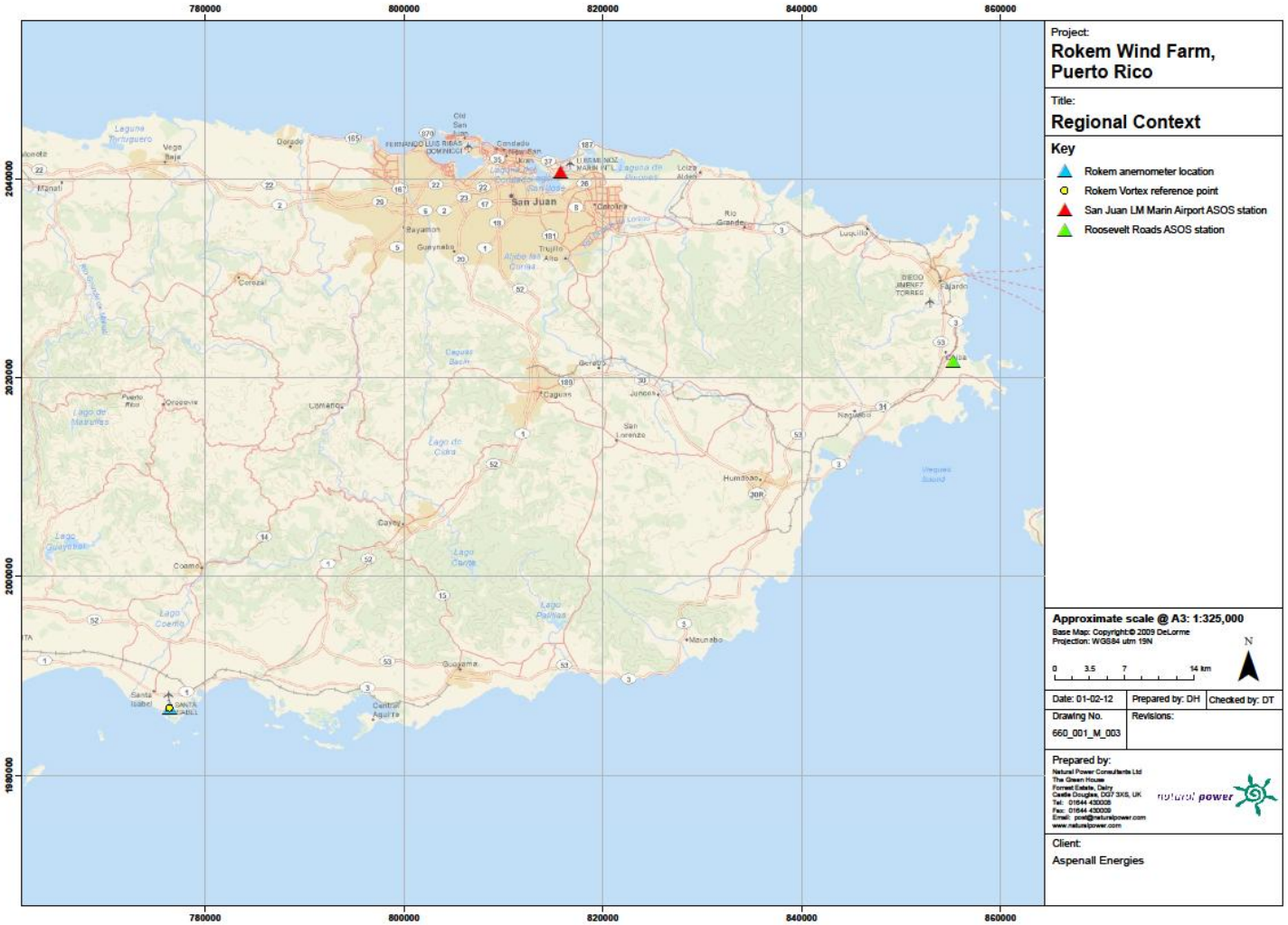


Figure A-5 Regional Context map for Rokem

Turbine ID	Easting	Northing	Hub height (m)
1	776904	1989079	95
2	776239	1988388	95
3	776387	1988690	95
4	777057	1988397	95
5	777464	1988724	95
6	776455	1989002	95

Table A-1 Turbine locations for Vestas V100m 1.8MW 6 turbine layout 95 m hub height

Turbine ID	Easting	Northing	Hub height (m)
1	776883	1989012	67
2	776239	1988450	67
3	777169	1988688	67
4	777164	1988278	67
5	776740	1988478	67
6	776463	1988807	67

Table A-2 Turbine locations for Vestas V90m 1.8MW 6 turbine layout 67 m hub height

B. ANNEX - MAST SPECIFICATIONS

Figure B-1 Picture showing characteristic terrain roughness around the mast

Figure B-2 Photograph of the 60m onsite anemometry mast

Channel	Type	Brand/Model	Height (m)	Slope	Offset (Deg)	Boom Length (m)	Boom Orientation (Deg)	Corrected Boom Orientation (Deg)	Boom Diameter (cm)	Boom Offset Height (cm)
Channel 1	Anemometer	NRG #40	60	0.756	0.38	1.5	90	180	1.27	15.24
Channel 2	Anemometer	NRG #40	60	0.755	0.37	1.5	180	90	1.27	15.24
Channel 3	Anemometer	NRG #40	50	0.757	0.38	1.5	90	90	1.27	15.24
Channel 7	Wind Vane	NRG #200P	60	-	-	1.5	0	0	1.27	15.24
Channel 8	Wind Vane	NRG #200P	50	-	-	1.5	0	0	1.27	15.24
Channel 13	Anemometer	NRG #40	50	0.755	0.35	1.5	180	180	1.27	15.24
Channel 14	Anemometer	NRG #40	40	0.752	0.38	1.5	0	180	1.27	15.24
Channel 15	Anemometer	NRG #40	40	0.756	0.34	1.5	180	0	1.27	15.24

Table B-1 On-site monitoring equipment, Rokem

OTECH ENGINEERING INC.

630 Peña Drive, Suite 800
Davis, CA 95618
530.757.2264
www.otechwind.com

ANEMOMETER CALIBRATION REPORT

Customer Name: NRG Systems, Inc.
Customer Address: 110 Riggs Rd, Hinesburg, VT 05461

This document reports that a calibration or transfer function test was performed in a wind tunnel for the instrument specified below. The test was done in accordance with current industry standards and Otech Laboratory and Calibration Procedures. The following data and resulting transfer function is the relationship between the reference wind speed measurement in the wind tunnel test section and the unadjusted signal output from the instrument under test (IUT) given the prescribed speed range.

IUT Model No: NRG #40
IUT Serial No: 179500104981
IUT Output: AC Sine Wave

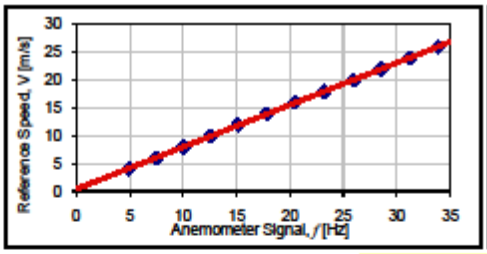
Test Date and Time: 3/24/09 10:26 AM
Test Speed Range: 4 - 26 m/s

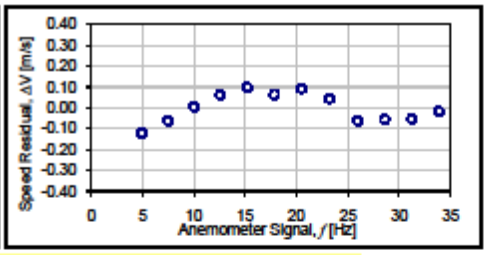
Wind Tunnel Test Facility
Otech Tunnel ID: WT2B
Type: Eiffel (open circuit, suction)
Test Section Size: 0.61 m x 0.61 m x 1.22 m
Manufacturer: Engineering Laboratory Design, Inc.

Data Acquisition
Hardware: National Instruments CDAQ-9172 USB 2.0 chassis with NI 9205 32-chan 16-bit AI module
Software: National Instruments LabVIEW 8.5
Signal Reduction Method for IUT: FFT to determine frequency

Measuring Equipment
Reference Speed: Four United Sensor Type PA Pitot-static tubes sensed by an MKS Barotron Type 220D Differential Pressure Transducer (NIST traceable)
Amb. Pressure: Setra Model 270 Barometer (NIST traceable)
Amb. Temperature: OMEGA HX94 SS Probe (NIST traceable)
Relative Humidity: OMEGA HX94 SS Probe (NIST traceable)

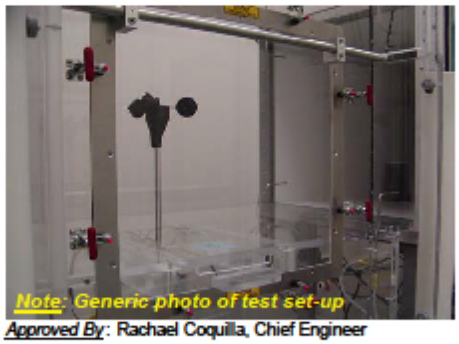
Test Conditions
Reference Speed Position Correction = 1
Reference Speed Blockage Correction = 1
Mean Ambient Pressure = 102286 Pa
Mean Ambient Temperature = 20.8 deg C
Mean Relative Humidity = 27.8% RH
Mean Density = 1.2094 kg/cubic meter





Transfer Function Test Results: **V [m/s] = 0.756 f [Hz] + 0.38**

r = 0.99995 std. err. estimate = 0.0749 m/s



Reference Speed [m/s]	Anemometer Output [Hz]	Residual [m/s]	Ref. Speed Uncertainty
3.971	4.906	-0.122	0.473%
7.947	9.993	0.006	0.465%
11.947	15.161	0.098	0.466%
15.962	20.477	0.092	0.461%
19.940	25.938	-0.060	0.463%
23.967	31.252	-0.052	0.466%
25.972	33.855	-0.016	0.464%
21.934	28.566	-0.055	0.463%
17.979	23.208	0.043	0.466%
13.932	17.831	0.064	0.468%
9.944	12.559	0.063	0.461%
5.978	7.479	-0.061	0.474%

Approved By: Rachael Coquilla, Chief Engineer

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References available upon request. Page 1 of 1 179500104981 2009-03-24.pdf

Figure B-3 Calibration report for A1

OTECH ENGINEERING INC.

630 Peña Drive, Suite 800
Davis, CA 95618
530.757.2264
www.otechwind.com

ANEMOMETER CALIBRATION REPORT

Customer Name: NRG Systems, Inc.
Customer Address: 110 Riggs Rd, Hinesburg, VT 05461

This document reports that a calibration or transfer function test was performed in a wind tunnel for the instrument specified below. The test was done in accordance with current industry standards and Otech Laboratory and Calibration Procedures. The following data and resulting transfer function is the relationship between the reference wind speed measurement in the wind tunnel test section and the unadjusted signal output from the instrument under test (IUT) given the prescribed speed range.

IUT Model No: NRG #40
IUT Serial No: 179500104983
IUT Output: AC Sine Wave

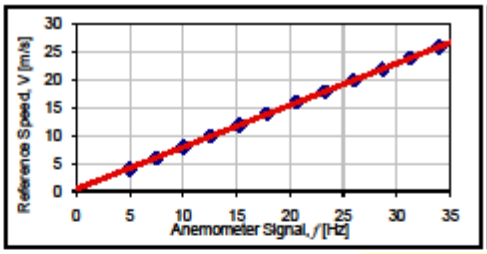
Test Date and Time: 3/24/09 10:47 AM
Test Speed Range: 4 - 26 m/s

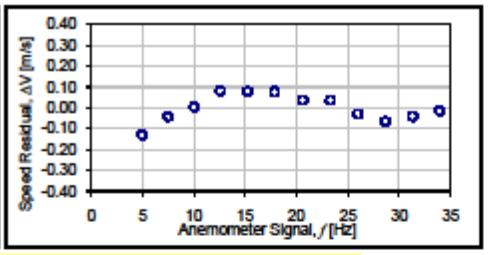
Wind Tunnel Test Facility
Otech Tunnel ID: WT2B
Type: Eiffel (open circuit, suction)
Test Section Size: 0.61 m x 0.61 m x 1.22 m
Manufacturer: Engineering Laboratory Design, Inc.

Data Acquisition
Hardware: National Instruments CDAQ-9172 USB 2.0 chassis with NI 9205 32-chan 16-bit AI module
Software: National Instruments LabVIEW 8.5
Signal Reduction Method for IUT: FFT to determine frequency

Measuring Equipment
Reference Speed: Four United Sensor Type PA Pitot-static tubes sensed by an MKS Barotron Type 220D Differential Pressure Transducer (NIST traceable)
Amb. Pressure: Setra Model 270 Barometer (NIST traceable)
Amb. Temperature: OMEGA HX94 SS Probe (NIST traceable)
Relative Humidity: OMEGA HX94 SS Probe (NIST traceable)

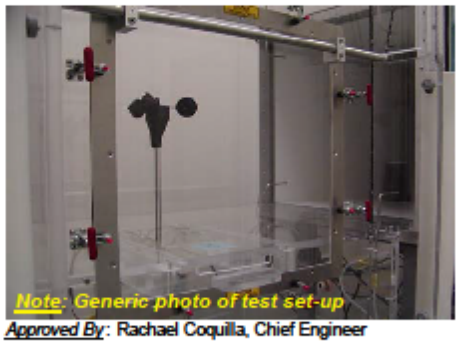
Test Conditions
Reference Speed Position Correction = 1
Reference Speed Blockage Correction = 1
Mean Ambient Pressure = 102282 Pa
Mean Ambient Temperature = 21 deg C
Mean Relative Humidity = 28% RH
Mean Density = 1.2086 kg/cubic meter





Transfer Function Test Results: **V [m/s] = 0.755 f [Hz] + 0.37**

r = 0.99996 std. err. estimate = 0.0684 m/s



Reference Speed [m/s]	Anemometer Output [Hz]	Residual [m/s]	Ref. Speed Uncertainty
3.970	4.946	-0.128	0.472%
7.945	10.038	0.004	0.463%
11.948	15.245	0.079	0.463%
15.967	20.626	0.037	0.489%
19.924	25.958	-0.029	0.457%
23.955	31.314	-0.040	0.467%
25.973	33.953	-0.013	0.462%
21.936	28.672	-0.066	0.468%
17.977	23.289	0.037	0.478%
13.930	17.874	0.077	0.464%
9.942	12.581	0.082	0.464%
5.977	7.489	-0.040	0.487%

Approved By: Rachael Coquilla, Chief Engineer

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References available upon request. Page 1 of 1 179500104983 2009-03-24.pdf

Figure B-4 Calibration report for A2