

THE STATE OF NEW HAMPSHIRE

BEFORE THE

SITE EVALUATION COMMITTEE

DOCKET NO. 2012-01

**APPLICATION OF ANTRIM WIND ENERGY, LLC
FOR A CERTIFICATE OF SITE AND FACILITY**

SECOND SUPPLEMENTAL PREFILED TESTIMONY OF SEAN MCCABE

FIRST SUPPLEMENTAL PREFILED TESTIMONY OF

RUBEN SEGURA-COTO, AND

PREFILED DIRECT TESTIMONY OF SALLY WRIGHT

ON BEHALF OF

ANTRIM WIND ENERGY, LLC

October 11, 2012

1 **Background and Qualifications**

2 **Q. Please state your name and business address.**

3 A. My name is Sean McCabe and my business address is 25 Braintree Hill Park,
4 Suite 200, Braintree, MA 02184. My qualifications have not changed from my January
5 31, 2012 prefiled testimony in this docket.

6 **Q. Please state your name and business address.**

7 A. My name is Ruben Segura-Coto and my business address is 601 Fawcett Drive,
8 West Branch, Iowa 52358. My qualifications have not changed from my August 22,
9 2012 prefiled testimony in this docket.

1 **Q. Please state your name and business address.**

2 A. My name is Sally D. Wright, P.E. My business address is 45 Main Street, Suite
3 302, Peterborough, NH 03458.

4 **Q. Ms. Wright, who is your current employer and what position do you hold?**

5 A. I am Senior Turbine Engineer in the Turbine Assessment Group at GL Garrad
6 Hassan America, and I am replacing my colleague Ellen Crivella in this docket and
7 adopting her January 31, 2012 and August 22, 2012 testimony.

8 **Q. What are your background, experience and qualifications?**

9 A. I am a Senior Turbine Engineer at Garrad Hassan America, Inc. I have over 11
10 years of experience in wind power and 19 years' broad experience in design and project
11 management in the fields of renewable energy, energy conservation, and power system
12 controls. I joined GL Garrad Hassan in 2008 and in my current role I evaluate wind
13 turbine technology for wind power projects throughout North America.
14 I formerly served as project manager and staff engineer at the University of
15 Massachusetts Renewable Energy Research Laboratory for over seven years, with a
16 primary focus on technical project development for community-scale wind installations.
17 Before transitioning to the wind industry, I designed, managed and installed steam
18 turbine cogen generators around the world, as an engineer at a back-pressure steam
19 turbine cogen packager and owner of district heating and cooling plants in North America
20 and Europe. My responsibilities there included project management, controls design,
21 applications engineering, and field work. I hold a Masters degree in Mechanical

1 Engineering from the University of Maine and I am a registered engineer in
2 Massachusetts and New Hampshire. More detailed information about my background
3 and experience is contained in my résumé, which is provided as Attachment SDW – 1.

4 **Purpose of Testimony**

5 **Q. What is the purpose of this testimony?**

6 A. The purpose of this testimony is to introduce Sally Wright as a member of this
7 panel, to adopt the previous testimony of Ellen Crivella, to address certain questions and
8 comments raised by certain parties in this docket related to the Acciona AW-3000/116
9 turbine model and to reiterate the roles that AWE, Acciona Windpower (“AWP”) and the
10 Balance of Plant (“BOP”) contractor will play in the construction and operation of the
11 Antrim Wind Project (the “Project”).

12 **Acciona AW-3000/116 Turbine Model**

13 **Q. Ms. Wright, do you have any direct experience in your role as a turbine**
14 **assessment engineer with wind turbine equipment manufactured by Acciona**
15 **Windpower?**

16 A. Yes. I have performed due diligence assessments of Acciona’s turbines since
17 2008. In support of this work, I inspected AWP’s assembly facility in West Branch, IA
18 and climbed an AW-1500 model turbine including hub entry in 2010. I have reviewed
19 the design and certification status of the AW-3000, and am co-author of GL Garrad
20 Hassan’s technical due diligence review of this turbine platform, which is used
21 internationally for due diligence on AW-3000 projects.

1 **Q. Ms. Wright, how do you respond to assertions that the AW-3000/116 turbine**
2 **is unproven technology which introduces an increased level of operating risk and**
3 **performance uncertainty for AWE and the Antrim Wind Project?**

4 A. GL GH applies specific criteria to assess new turbine models; the Acciona
5 AW-1500 Series meets our criteria and thus is considered by GL GH to be proven in
6 North America. The Project's turbines are in Acciona's AW-3000 Series, which is a
7 newer turbine model largely based on Acciona's experience with the AW-1500 Series.
8 This newer model does not yet meet the installation numbers required for this proven
9 status; however, new turbine models from reputable manufacturers such as Acciona are
10 routinely introduced into the marketplace and evaluated and certified in the manner
11 Acciona has undertaken for the AW-3000 series turbines, and such turbines are
12 successfully placed into service across the globe.
13 To make projections of reliability and maintenance needs for a turbine model without a
14 large track record, GH considers a number of factors. The AW-3000 design is based on
15 the AW-1500 Series and can be considered an up-scaled version of the AW-1500
16 platform. The turbine is designed by Acciona, which, in GL GH's opinion, has the
17 necessary experience and staff to achieve reliable design and operation based on the
18 proven track record and operating performance of the AW-1500. The AW-3000's major
19 components are supplied to a large extent by sub-suppliers with experience in the wind
20 industry, many with experience supplying components used in the AW-1500 Series.
21 Finally, Acciona has received third-party design certification for two turbines of

1 AW-3000 Series including the AW-3000/116, and expects to receive type certification
2 for the AW-3000/116 model in 2013.
3 In summary, since the AW-3000 includes many designs and components that are
4 commonly used by modern megawatt-class turbines and the design concept is based on
5 the AW-1500 Series, I do not foresee any notable issues with the safety and reliability of
6 the Project's proposed turbines.

7 **Roles of AWE, AWP and the Balance of Plant ("BOP") Contractor**

8 **Q. Mr. McCabe, can you summarize the roles that AWE, AWP and the BOP**
9 **contractor will play in the construction and operation of the Project?**

10 A. As described on p. 56 of the SEC Application, Section H.5, AWE will retain
11 overall responsibility for the construction of the Project through an agreement with a
12 BOP contractor. The scope of this agreement will cover civil and electrical work, as well
13 as turbine erection. AWE will have overall responsibility for the operation of the Project
14 through the administration of an O&M services agreement with AWP and the on-site
15 presence of an AWE Site Manager. The term of the O&M Agreement with AWP will
16 cover the commercial operations date through at least the first five years of the Project's
17 operation. After the initial service period, AWE will either extend the term of the O&M
18 agreement with AWP or contract with another third party O&M service provider to
19 operate the Project

20 **Q. Mr. Segura-Coto, as Director, Post-Sales Service for AWP please explain**
21 **your role in the construction of the Project?**

1 A. AWP Post-Sales Service Department is not responsible for the construction phase
2 of the Project, but is responsible for the operation, maintenance and provision of
3 technical support during the commercial operation of the turbines.

4 **Q. Ms. Wright, is AWE's plan for construction and operation consistent with**
5 **common practice in the wind industry?**

6 A. Yes.

7 **Q. Do you have anything further to add to this testimony?**

8 A. No, not at this time.

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GL Garrad Hassan



SALLY D. WRIGHT, PE

1. Family Name	WRIGHT		
2. First Name(s)	Sally D.		
3. Date when Joined Company	January 2008		
4. Citizenship	American		
5. Language Skills: (Mark skills as EX for Excellent, VG for Very Good, G for Good, F for Fair and B for Basic)			
Language	Reading	Writing	Speaking
English (native)	EX	EX	EX
German	G	F	G (formerly fluent)
Spanish	G	B	F
Japanese	B	B	B
6. Professional Experience			
Company	Date	Roles and Responsibilities	
GL Garrad Hassan North America Senior Turbine Engineer, Turbine Assessment Group	2008 – present	<ul style="list-style-type: none"> • Wind turbine technology due diligence: Support clients with technical services in relation to turbines, supply chains, failure analyses, and operational and maintenance issues. Inspection of turbine installations, manufacturing facilities, and failures. • Wind turbine technology review: Provide reports and support on the status of specific turbine technology issues including availability, reliability, manufacturer history, type failures, and certification. Maintain good relationships with turbine suppliers to ensure access to up-to-date information. • Wind turbine site suitability: Review and report on the suitability of specific turbine models to wind project sites, with particular attention to IEC 61400-1 certification requirements and structural loads analyses, primarily in support of GHA's due diligence work. • Technical wind turbine availability: Analyze turbine-specific availability and develop reliability projections. Developed GHA turbine group's evaluation methods and policy. • Wind turbine manufacturing review: Conduct audits of manufacturing and assembly plants including review of their quality management systems. • Management: Manage a team of engineers responsible for turbine technology due diligence and site suitability assessment. 	

Renewable Energy Research Lab, University of Massachusetts at Amherst Staff Engineer & Research Fellow	2001 – 2007	<ul style="list-style-type: none"> • Wind Power Siting and Development Developed and operated programs to offer various services regionally, including: <ul style="list-style-type: none"> ◦ Wind power feasibility, system design, turbine specification, community wind planning; ◦ Site analysis, production estimation, visualizations, noise & flicker estimation; ◦ Offshore wind project siting and mapping; ◦ Wind data analysis, anemometer tower installation, tower climbing. • Developed and ran state-wide Anemometer Loan Program under federal “Wind Powering America” program. • Massachusetts Wind Working Group: launched and ran this state industry group of stakeholders. • Wind Power Support: Project management, outreach and public education for wind energy, public speaking; Renewable energy and environmental technology evaluation.
Trigen Ewing Power / Turbosteam Project, Application, and Field Engineer	1993 – 2001	<ul style="list-style-type: none"> • Project Manager in industrial energy conservation company; all phases of the supply of steam turbine cogeneration systems. Designed, implemented and tested control systems. Specified, designed and ordered components. Specialized in utility interconnection – compliance with grid requirements of local utilities. • Field Engineer: Lead and solo field engineer in commissionings worldwide. Started up rotating power generation equipment, controls systems and switchgear. Troubleshooting of steam equipment and control systems. • Application Engineer: Evaluated cogen potential in industrial sites; system design & control design; public presentations. Developed design & evaluation tools, and sales & project management software used by whole company. Trained sales staff in equipment specification.
Applied Science Associates / SEA Computer Programmer	1992 – 1993	<ul style="list-style-type: none"> • Developed Computational Fluid Dynamics (CFD) computer code for oil spill models, water quality, and natural resources.
MicroMagic Computer Programmer	1986 – 1989	<ul style="list-style-type: none"> • Developed graphic user interfaces and game design for computer games.
Kienzle Apparate GmbH Computer Programmer	1984, 1985	<ul style="list-style-type: none"> • Intern computer programmer in Baden-Württemberg, Germany. All business in German.

7. Education		
Institution	Date	Academic Qualifications
Rensselaer Polytechnic Institute (RPI) & University of Massachusetts at Amherst	2007 – 2008	Courses in Electrical Engineering & graduate study in Electric Power Systems Engineering
University of Maine at Orono	1989 – 1992	MS, Mechanical Engineering
Kawara Juku, Kyoto, Japan	1991	Japanese language school
Williams College	1981– 1986	BA, Computer Science
Universität Göttingen, Germany	1984 – 1985	Mathematics, Undergraduate study in German
8. Licenses and Certifications		<ul style="list-style-type: none"> • Licensed Professional Engineer, Mechanical, Massachusetts and New Hampshire. • Certified instructor: tower climbing safety & rescue. • Siemens Level I and II tower safety and rescue training.
9. Accomplishments and Recognitions		<ul style="list-style-type: none"> • Director and Board Chair: Northeast Biodiesel, LLC: building a regional biodiesel production facility. On board of directors from inception in 2004 to 2007. • Director and Board Chair: Co-op Power / CoopPlus: regional consumer-owned energy cooperative. Board member 2003-2007. • Regional Wind Advocacy Award, from US Dept. of Energy, Wind Powering America, 2005: "In recognition of her leadership, creativity and commitment to wind energy development". • Innovation Trophies 1997, Suez Lyonnaise des Eaux, for conception of small cogen system. • Pi Tau Sigma, National Mechanical Engineering Honor Fraternity 1992. • Graduate scholarship & research assistantship, University of Maine 1990-1992. • National Science Foundation grant, Mechanical Design Automation Lab, UMass 1989. • BA degree with honors, Dean's list 5 out of 6 semesters, Williams College 1986. Honors student, University of California, Berkeley 1983-1984.

10. Publications

- *Characterising Turbine Availability: Many Uses, Many Definitions*, 2011 NZWEA and CANWEA annual conferences (w/ Josiah Chamberlain).

Available at
windenergy.org.nz/documents/conf11/gwhite.pdf

- *Wind Power at Guantanamo Bay: A Hybrid Wind-Diesel System for the US Navy at Guantanamo Naval Base Using an Energy Savings Performance Contract*, Proc. Of the 2004 AWEA Annual Conference (w/ McGowan, Manwell, Abdulwahid, and Ingold.)
- *Wind Turbine Siting in an Urban Environment*, Proc. Of the 2003 AWEA Annual Conference, Austin, TX (w/ McGowan, Rogers, Ellis, Manwell, MacLeod and Brown.)
- *Massachusetts Wind Energy Predevelopment Support Program & Feasibility Study for Marblehead, Massachusetts*, Proc. of the 2003 AWEA Annual Conference (w/ Devine, O'Connor, Ellis, Rogers, and Manwell.)
- *Transmission Options for Offshore Wind Farms in the United States*, Proc. Of the 2002 American Wind Energy Assoc. Annual Conference. (Lead author, w/ Manwell, Rogers and Ellis.)

The above are available at
www.ceere.org/rerl/rerl_publications.html