



GE Renewable Energy  
Onshore Wind

**Jefferey Sendzicki**  
Project Director – OnShore NAM

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**Josh Tran**  
**NextEra Energy Resources, LLC**  
700 Universe Blvd. Juno  
Beach, FL 33408

January 3, 2019

**Subject:** Crowned Ridge Wind, LLC

Dear Mr. Tran,

The responses provided herein shall in no way be construed as a waiver of the confidentiality clause contained in the Master Turbine Supply Agreement between NextEra and GE.

NEER's wind development program requires the procurement of large numbers of wind turbines for multiple projected projects 6-18 months in advance of a calendar year build. The 2.7 MW capable turbines installed at Crowned Ridge I were contracted for in March and September of 2018 as part of a 300 unit turbine commitment for 2.3 to 2.7 MW capable machines, understanding that, depending on which project(s) the turbines were assigned and site specific requirements (Large Generator Interconnect restrictions, local and state permitting commitments, etc.) turbines would be nameplated accordingly within the range of manufacturer's turbine capability specifications (2.3 to 2.7 MWs). The 2.7 MW designation reflected in the pictures provided to NEER are per GE's standard component identification process which documents the maximum MW capability of the component and not the MW rating the component/turbine will actually be nameplated for at a specific project. In the case of Crowned Ridge I, all 87 installed turbines are nameplated at 2.3 MW.

The following answers are provided in response to Staff First Set for Data Requests:

1. Please identify each component of a GE 2.72-116 wind turbine that differs from the GE 2.3-116.

**Response:**

The Generator, Gearbox, Hub and Converter are different for a GE 2.72-116 wind turbine and a GE 2.3-116 wind turbine. These differences do not impact hub height, rotor diameter, the sound profile or the amount of shadow flicker.

2. Does GE consider the GE 2.3-116 wind turbine to be the same model as a GE 2.72-116 turbine? Please explain.

**Response:**

No, the 2MW Platform or as referred to in the Crowned Ridge Wind Application as the 2 MW model series 116 is comprised of multiple turbine models ranging from 2.0MW to 2.8MW with 116m and 127m rotor diameters. Crowned Ridge Wind purchased the 2.3 MW 116m in this Platform or series.

3. Please explain how a nameplate rating can be changed with only software changes.


**Response:**

A nameplate rating cannot be changed with only software changes. The process for updating the nameplate rating is set forth below. A turbine operates at the Turbine Nameplate Power. A picture of a Turbine Nameplate at the Crowned Ridge I site is shown in Figure 1 below. To update a turbine for operation above 2.3MW the following steps need to be performed.

- a) A mechanical-loads analysis (MLA) needs to be performed for the Turbine Model and the MLA results need to indicate that the Turbine Model (e.g. 2.7-116) is suitable for the site.
- b) A site-specific Foundation Load Specification, based on the Turbine Model, needs to be developed to convey the loads for the turbine foundation design.
- c) The equipment hardware, including the Generator, Gearbox, Hub, Tower and Converter need to be aligned with the Turbine Model (e.g. 2.7-116) indicating the components are capable of operation at the higher megawatt level.
- d) Model specific turbine software needs to be generated and installed on each turbine to be updated to a higher megawatt level.

The nameplate for Crowned Ridge Wind is 2.3, and the below is an example of the nameplate being affixed to the turbine. The photographs submitted by the Intervener are not nameplates.

Figure 1 - Turbine Nameplate:

		GE Generators LLC 8301 Scenic Highway Pensacola, Florida 32514-7810 USA
Project name	Crowned Ridge I	
Year of construction	2019	
Power (MW)	2.3MW	
Reference Wind Speed (m/s)	38 m/s	
Max Survival Wind Speed (m/s)	56m/s	
Cut-In Wind Speed (m/s)	3 m/s	
Cut-Out Wind Speed (m/s)	22 m/s	
Operating temperature range	-30 ... 40 °C	
Wind zone	IEC S	
Hub Height (m)	90m	
Rotor Diameter (m)	116m	
Low Speed Shaft RPM	8-15.7	
High Speed Shaft RPM	800-1631	
Over Current Protection: Stator	1900	
Over Current Protection: Rotor	750	
Short Circuit Interrupting Capacity: Stator	38kA	
Short Circuit Interrupting Capacity: Rotor	38kA	
Rated voltage	690V	
Frequency	60Hz	
System: Doubly Fed Asynchronous Generator with Power Converter on Rotor Side		
Unit: Variable Speed, Pitch Controlled		

4. Please provide the manufacturer's sound power levels for a GE 2.72-116 turbine operated at 2.3 MWs.

**Response:**

The acoustic emission characteristics of the 2.3-116 wind turbine summarized in the "Wind Turbine Generator Systems 2.3-116 with LNTE 50Hz and 60Hz - Product Acoustic Specifications" and "Wind Turbine Generator Systems 2.3-116 - 50Hz and 60Hz - Product Acoustic Specifications" are applicable to turbines with a nameplate power of 2.3MW and a nameplate rotor diameter of 116m.

Additionally, we understand that Crowned Ridge Wind will use the newly developed GE Enhanced Power Curve Operation ("EPCO") software technology which allows Crowned Ridge Wind to provide additional sound mitigation of approximately 1.5 dBA even before installation of LNTE on the turbine blades.

Enhance Power Curve Operation ("EPCO") is a new software option that produces more torque at a lower rpm and slows down the overall speed of the blades which results in a quieter turbine. This does not increase the maximum output of the turbine.

If you have any additional questions, please feel free to reach out to me.

Sincerely,



Jeffrey J. Sendzicki

**From:** [Sendzicki, Jeffrey J \(GE Renewable Energy\)](#)  
**To:** [Barron, Mitchell](#); [Harrigan, Alice](#)  
**Cc:** [Murphy, Brian J.](#)  
**Subject:** RE: CR I Waiver Question - Crowned Ridge I  
**Date:** Saturday, January 4, 2020 2:49:36 PM

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GE hereby certifies that the software installed on all 87 turbines at the Crowned Ridge I project site limit the maximum power output of each individual turbine to 2.3 MW.

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**From:** Barron, Mitchell <MITCHELL.BARRON@nexteraenergy.com>  
**Sent:** Saturday, January 4, 2020 2:38 PM  
**To:** Sendzicki, Jeffrey J (GE Renewable Energy) <jeffrey.sendzicki@ge.com>  
**Cc:** Murphy, Brian J. <Brian.J.Murphy@nexteraenergy.com>  
**Subject:** EXT: CR I Waiver Question - Crowned Ridge I

Jeff,

Please confirm for GE that (i) all turbine hardware at Crowned Ridge I (CR I) , including but not limited to the generator, gearbox and hub is designed for and supplied such that the CR I turbines will operate at 2.3MW (ii) all software is designed for and has parameters set for all of the CR I turbines to operate at 2.3MW. Please respond by email today and on GE letterhead first thing Monday.

***Mitch Barron***  
*Senior Sourcing Specialist*  
*Integrated Supply Chain*  
*Engineering & Construction*

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**From:** [Sendzicki, Jeffrey J \(GE Renewable Energy\)](#)  
**To:** [Barron, Mitchell](#)  
**Cc:** [Murphy, Brian J.](#)  
**Subject:** RE: CR I Waiver Question - Crowned Ridge I  
**Date:** Saturday, January 4, 2020 2:02:32 PM

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**CAUTION - EXTERNAL EMAIL**

Mitch,

I confirm that you statement below is correct.

Thanks,  
Jeff

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**From:** Barron, Mitchell <MITCHELL.BARRON@nexteraenergy.com>  
**Sent:** Saturday, January 4, 2020 2:38 PM  
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