

May 3, 2022

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Via email: Mahdi.Zangeneh@ontario.ca

Re: Response to comments provided in meeting on April 21, 2022
Borealis Blade Protection System Immission Audit
Amherst Island Wind Project
Renewable Energy Approval Number: 7123-9W9NH2

Dear Mr. Zangeneh,

Further to the comments provided in our meeting on April 21, 2022, please find the project responses and supporting information below:

1. Discrepancies in the setback distance and UTM coordinates found in Table 1 of the Second Immission Audit Report, dated March 10, 2022.

Upon further review, the reported setback distance of 740 m between monitoring location M1 and WTG S37 is incorrect. The correct distance between monitoring location M1 and WTG S37 is 734 m. The reported UTM coordinates and sound level prediction are correct.

2. Data supporting the statement that the sound level impact of the Borealis ice protection system is negligible.

Section 3.1.1 of the latest version of the MECP publication “*Noise Guidelines for Wind Turbines*” provides a set of transition rules for REA amendment applications. Notably, the transition rules only apply provided the application does not include any of the following changes:

- a. A change to the location of a wind turbine or transformer substation;
- b. an increase to the octave-band sound power levels (linear weighted) of a wind turbine, as calculated in accordance with the standard specified in paragraph 1 of subsection 1(6.1) of Ontario Regulation 359/09, unless there would be no resulting increase to the sound levels at any point of reception within 1,500 metres (m) of the wind turbine;
- c. an increase to the acoustic emissions of a transformer substation, as calculated in accordance with ANSI/IEEE C57.12.90, Reference [7], unless there would be no

- resulting increase to the sound levels at any point of reception within 1,500 m of the transformer substation; or
- d. the addition of one or more wind turbine(s) or transformer substation(s).

Of the four criteria, only b) is potentially relevant to the installation of the Borealis ice protection system inside of WTG S37, or any other wind turbine. The following information supports the conclusion that part b) is not applicable, and that the Transition Rules in Section 3.1.1. apply to an REA amendment application to install Borealis ice protection systems.

Table 1 shows the manufacturer’s sound power level in octave bands for WTG S37, a Siemens model SWT-2.942-113, compared to the octave-band sound power results obtained from an IEC 61400-11 test performed on WTG S37. The test was completed by HGC Engineering on April 22, 2021, and was summarized in a report on June 9, 2021. The IEC 61400-11 test was conducted while the Borealis ice protection system was operating.

Table 1 - Sound Power Levels of WTG S37, Summary

Data Source	Measurement [dBA]	Octave Band Center Frequency [Hz]								Overall [dBA]
		63	125	250	500	1000	2000	4000	8000	
Siemens SWT-2.942-113 specifications	Sound Power Level	91.2	93.7	96.1	97.3	98.9	98.5	95.8	82.0	105
	Measurement Uncertainty	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
IEC4100-11 Test with Borealis Operational [^]	Sound Power Level	90.5	91.7	94.5	96.4	98.3	95.9	88.5	86.3	103
	Measurement Uncertainty	1.0	1.1	1.1	0.9	0.7	0.8	1.7	2.6	0.9
Change in Sound Power Level with Borealis Operational		-0.7	-2.0	-1.6	-0.9	-0.6	-2.6	-7.3	4.3*	-2.0

[^] Sound power level and measurement uncertainty obtained from the 12.5 m/s wind speed bin, which represent the highest measured sound power level during the test.

* Sound at 8000 Hz is caused by environmental interference, not the Borealis system.

As shown in Table 1, the sound power level of WTG S37, measured according to IEC 61400-11 while the Borealis ice protection system was operational, is less than the manufacturer’s specified sound power level in all octave bands below 8000 Hz. The increase in sound power level at 8000 Hz is caused by environmental interference (i.e., insects) and unrelated to the operation of the Borealis system inside WTG S37.

In addition to the IEC 61400-11 test conducted on WTG S37 while the Borealis system was operational, two Immission audits were conducted by HGC Engineering at a nearby measurement location, selected to represent a receptor with the highest predicted sound level at the project.

The first Immission Audit, summarized in a report issued on June 24, 2021, indicated that there was no correlation between the Borealis operation and the sound level at the measurement location. After aggregating sound level results by wind speed and Borealis operation there were several instances where the measured sound level was higher without the operation of the Borealis system. In instances where the measured sound level was higher with the Borealis system operating in a given wind condition, the difference in sound level was within the calculated standard deviation of the measurements.

The second Immission Audit, summarized in a report issued on March 10, 2022, repeated the general procedure of the first Immission Audit, but with a focus on determining compliance with the MECP sound level criteria. The same measurement location was used for both Immission Audits. The results of the second Immission Audit found that the sound level with and without the Borealis system operating was equivalent in all applicable wind speed bins, within the standard deviation of the measurement.

Based on the results of the IEC 61400-11 testing and both Immission Audits, there is no increase in the octave-band sound power level of WTG S37 with the operation of the Borealis ice protection system, in comparison to the guaranteed sound power level from Siemens. Therefore, the transition rules outlined in Section 3.1.1 of the MECP publication “*Noise Guidelines for Wind Turbines*” apply to the REA amendment application to install Borealis ice protection systems at the Amherst Island Wind Farm.

We trust the above satisfies the comments. If you have any questions or additional comments, please do not hesitate to contact us.

Yours truly,
Howe Gastmeier Chapnik Limited



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