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10207028-HOU-L-01-B

Subject: Proposed Noise Abatement Action Plan (NAAP) for the North Kent Wind Project

Dear M. Zangeneh:

This letter provides details of the proposed NAAP that will be implemented by the North Kent Wind Project (the "Project"). DNV GL has been retained as Acoustical Consultant to the Project to develop the NAAP.

The NAAP is being implemented in response to the exceedance of the Noise Performance Limits at R3408, as measured during the acoustic immission audit (I-test) performed by Aercoustics [1].

DNV GL updated the acoustic model that was previously used to calculate the results reported in the original Noise Impact Assessment Report [2], which was used to obtain the Project's Renewable Energy Approval (REA) [3]. In addition to using the as-built layout, modeled turbine sound power levels were updated based on:

- The results of the IEC tests (or E-tests) [4][5][6] recently performed at the Project by Aercoustics when applicable, and
- Updated octave band spectra supplied by Siemens Gamesa [7][8] for all existing and new noise modes of the SWT-113 wind turbine.

See Table A-2 in Appendix A for more detail.

Immission testing at the preselected points of reception (PoR) was also performed by Aercoustics. As mentioned above, one receptor (R3408) demonstrated non-compliance, with a maximum sound pressure level of 41 dBA [1]. This includes a tonality penalty of 1 dB. All other audited PoRs were deemed to be compliant based on their respective I-test results.

For the purpose of this NAAP, a new operating mode for the Siemens SWT-113 turbine, referred to as

the -3 dB operating mode with a nominal sound power level of 103 dBA, has been introduced to the Project.

The following NAAP is proposed by DNV GL to ensure that the sound level at R3408 complies with the Noise Performance Limits, as per Section C of the Project's REA approval:

Daytime operation (7:00 to 19:00): No changes to the current operating schedule are required because the Project respects the 45 dBA daytime limit at all Class 3 receptors, per NPC-300. Both the I-tests and acoustic modeling do not demonstrate any maximum sound pressure levels exceeding 45 dBA.

Nighttime operation (19:00 to 7:00): Two of the Project turbines (T3 and T4) will undergo reduced noise operation during nighttime by switching to the -3 dB noise mode, with a rated capacity of 2.628 MW and nominal maximum sound power level of 103 dBA. As a result of this change, the updated noise propagation model predicts a reduction of exactly 1.0 dB at R3408, which effectively offsets the 1 dB exceedance reported in the I-test [1], thus bringing the receptor back into compliance with the applicable nighttime Noise Performance Limits.

Appendix A contains the details of the proposed NAAP.

T3 and T4 will have daily automated program changes to enable them to operate at reduced mode during nighttime. Every day at 19:00, the turbines will be automatically switched to the lower noise mode (-3 dB noise mode). At 07:00 the next morning, T3 and T4 will resume operation in their regular operating mode (i.e. -2 dB noise mode) until 19:00.

For the sake of conservatism, this NAAP will apply for all nighttime hours, regardless of wind direction or wind speed.

Sincerely,



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References

- [1] Aercoustics - North Kent Wind 1 LP - Phase 2 Acoustic Immission Audit - Part 1 of 5 - R3408. 28 February 2020.
- [2] DNV GL - North Kent 1 Wind Project Renewable Energy Approval Application - Noise Impact Assessment. 800809-CAOT-R-01-F. 9 May 2016.
- [3] MOECC – Renewable Energy Approval Number 5272-A9FHRL. June 29, 2016.
- [4] Aercoustics - North Kent Wind 1 LP – Turbine T36 IEC 61400-11 Edition 3.0 Measurement Report. Revision 2. 19 July 2019.
- [5] Aercoustics - North Kent Wind 1 LP – Turbine T33 IEC 61400-11 Edition 3.0 Measurement Report. Revision 2. 19 July 2019.
- [6] Aercoustics - North Kent Wind 1 LP – Turbine T06 IEC 61400-11 Edition 3.0 Measurement Report. Revision 1. 27 May 2019.
- [7] Siemens Gamesa. Standard Acoustic Emission, SWT-3.2-113 2A, Rev. 0. Document ID: SGRE ON CRO AM NA TE-40-0000-062AA0F-00. 15 April 2020.
- [8] Siemens Gamesa. Standard Acoustic Emission, SWT-3.2-113 2A, Rev. 0. Document ID: SGRE ON CRO AM NA TE-40-0000-062AA10-00. 21 April 2020.

APPENDIX A – PROPOSED NOISE ABATEMENT ACTION PLAN

Table A-1 Noise Abatement Action Plan Summary

Turbine ID	As-built Coordinates NAD83 UTM zone 17		New Nominal Sound Power Level [dBA]	New Operating Mode	Original Operating Mode
	Easting [m]	Northing [m]			
T3	394852	4708795	103	-3dB	-2dB
T4	395101	4709126	103	-3dB	-2dB

The actual sound power levels used for the modeling exercise are shown below.

Table A-2 Turbine Mode Summary

Turbine mode	Nominal sound power level [dBA]	Modeled sound power level [dBA]	Comments
SWT-113 3200 kW (Standard)	106	106.1	Maximum E-test sound power level
SWT-113 2942 kW (-1dB)	105	105.2	Updated octave bands, including 31.5 Hz
SWT-113 2772 kW (-2dB)	104	104.1	Updated octave bands, including 31.5 Hz
SWT 113 2628 kW (-3dB)	103	103.0	New noise mode

Note: For each turbine mode, the loudest of the maximum theoretical manufacturer sound power level (using updated octave band data) and the maximum sound power level measured during the corresponding E-test was used.