Lein, Jerry R.

From: Jim Atkinson (ALLETE) [jbatkinson@allete.com]
Sent: Monday, October 25, 2010 12:22 PM
To: Lein, Jerry R.
Cc: David Moeller (ALLETE)
Subject: Permit Modification Request
Attachments: BisonWind-ProjectFacilitiesLayout_101410_.pdf; 2917-rz-ws-direct-drive-en-x3.pdf

Good afternoon Jerry,

As I indicated in previous conversations, Minnesota Power has been evaluating the potential benefits of installing newer, larger capacity wind turbine generators for its second phase of Bison I, (Phase 1B) scheduled to be in service by December of 2011. Minnesota Power's decision to pursue any necessary permit modifications to deploy this technology is outlined below. Please consider this e-mail and its attachments as Minnesota Power's request for North Dakota Public Service Commission approval of a modification to the Certificate of Site Compatibility issued in Case No: PU-09-151.

Equipment: The new turbine type is Siemens model SWT-3.0-101 which features a direct drive generator and no gear box, eliminating about half of the total parts in the turbine. The new turbine is anticipated to deliver up to 20% more energy per turbine through the higher capacity and improved efficiency while weighing about 10 tons less than the SWT-2.3-101 turbines being deployed on the first phase of Bison I (Phase 1A). The new turbines are deployed on the same 80 meter towers and are fitted with the same 101 meter diameter rotor hub-blade assembly. The new turbines may require slightly larger foundations. Though final engineering is not yet complete, estimates indicate an increase in foundation diameter of up to one foot.

Project Layout: The main effect of utilizing the new turbine technology on project layout would be a decrease by two in the total number of turbines. If approved by the commission, this permit modification would result in a total build out for Bison I of 31 turbines (16 SWT-2.3-101 and 15 SWT-3.0-101) and a total generating capacity of 81.8MW. Previously the total generating capacity was 75.9MW. With the elimination of two turbines comes a reduction in the total length of access roads (approximately one less mile) and underground collector system (approximately two less miles). In addition, further performance modeling recommends moving wind turbine generator (WTG) 30 approximately 215 feet to the east-southeast to reduce wake effect from WTG 2. The attached layout represents the new location for WTG 30 and the overall project layout with the reduced footprint.

Noise Levels: As measured 10 meters above ground level at the turbine location with an eight meter per second wind speed, the SWT-3.0-101 turbine is expected to produce a sound power level of 108 decibels, half a

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decibel less than the sound power level used in modeling presented in section 7.6.2 of Minnesota Power's original site permit application submitted to the Commission in May 2009. As a result, the original modeling remains valid for the new turbine because a change of at least 3 decibels is necessary for human perception.

Shadow Flicker: The elimination of two turbines from the project layout will result in a decrease in shadow flicker exposure at certain sensitive receptors. The shadow flicker produced by the remaining turbines would not increase as a result of this amendment because the new turbines utilize the same towers, tower locations and rotor hub-blade assemblies.

Due to turbine manufacturing constraints, Minnesota Power is seeking Commission approval by December 23, 2010 in order to deploy the new wind turbines on Phase 1B.

Please let me know if you need additional information or have further questions.

Jim Atkinson

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