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July 16, 2004

Vickie Fischer  
Rapid City Planning Department

Dear Ms. Fischer:

Subject: Rapid City AC/DC Tie Substation – Noise Study

Enclosed are three reports dealing with the Rapid City AC/DC Tie Substation noise issue. Two of the reports address the noise level at the fence line of the substation and the third report summarizes noise measurements taken at nearby residences with the substation de-energized and operating at full load.

As you know, the \$70 million AC/DC Tie Substation (DC Tie) was a joint project between Basin Electric Power Cooperative (Basin) and Black Hills Power to improve power system reliability in the area, to meet the increasing power demands in western South Dakota and Eastern Wyoming and to stabilize the cost of power resources for all consumers. The South Dakota Public Utilities Commission (SDPUC), through a Certificate of Public Convenience and Necessity (Certificate), permitted an operating noise level of 62 decibels (dBA) at the fence line for the DC Tie. ABB Power Technologies, responsible for the design and construction of the project, tested noise levels while the DC Tie was at full load on October 2, 2003 and determined that the requirements of the Certificate had been met. The Technical Report titled “**Audible Sound Measurements around Rapid City Tie Station**” was prepared by ABB in November 2003.

Noise complaints in March, primarily from Jackie and Duane Miller, prompted Basin and Black Hills Power to commission a third party consultant, Burns & McDonnell from Kansas City, to conduct a noise assessment at the affected residences. The first part of the study was done in late April. As I mentioned above, tests were conducted with the DC Tie operating at full load (200 MW) and de-energized. Follow-up tests were conducted in June. The **Noise Assessment Study with Addendum**, prepared by Burns & McDonnell in July 2004, will show the audible noise levels at the residences are nearly the same, whether the DC Tie is operating or de-energized. In particular, measurements taken in the Miller’s 2<sup>nd</sup> floor bedroom (with the windows closed) were nearly identical whether the DC Tie was operating or de-energized. The levels measured were:

- DC Tie at 200 MW – April: 32.7 dBA
- DC Tie at 200 MW – June: 32.6 dBA
- DC Tie de-energized, power in home shut off – June: 32.5 dBA

July 16, 2004  
Page 2

As part of the Noise Assessment Study, measurements were also taken at the DC Tie fence line so that we could measure the drop in noise levels from the fence line to the affected landowners' properties. The difference in noise level between the fence line and the affected landowners' properties was significant, however a handful of measurements at the fence line were slightly higher than the SDPUC approved level of 62 dBA. Follow-up measurements were taken in June to duplicate the exact methods and locations of the ABB compliance measurements taken in October. Again, several of the readings at the fence line were slightly higher than 62 dBA. The results are published in Burns & McDonnell's "**Operational Noise Compliance Assessment with Addendum**".

It is Basin and Black Hills Power's intent to implement measures that will bring the noise levels at the DC Tie within compliance of the SDPUC Certificate. ABB has been instructed to design appropriate sound reduction measures. In addition, we will continue to monitor and test the equipment and the incoming transmission systems, to try to determine if unknown factors are affecting the noise level. I am hopeful that I will be able to provide additional information at next week's meeting regarding our efforts.

Thank you for your understanding and patience. If you have questions regarding the reports, please give me a call.

Sincerely,



Jim Keck

xc: Pennington County Commission  
Scott Anderson – Penn Co Planning  
RC Planning Commission  
Vickie Fischer – RC Planning  
Steve Wegman – SD PUC  
Duane and Jackie Miller  
Jim Miller – Basin Electric Power Cooperative

Attachments