**State of Minnesota**

**Department of Commerce**

**Division of Energy Resources**

**Utility Information Request**

Docket Number: E015/CN-12-1163 Date of Request: July 7, 2014

Requested From: David R. Moeller, Senior Attorney Response Due: July 17, 2014

Analyst Requesting Information: Stephen Rakow

Type of Inquiry: [ ] Financial [ ] Rate of Return [ ] Rate Design  
 [ ] Engineering [ ] Forecasting [ ] Conservation  
 [ ] Cost of Service [ ] CIP [ ] Other:

***If you feel your responses are trade secret or privileged, please indicate this on your response.***

Request

No.

13 Please explain what “risk of control interaction” as discussed on page 106 of the Petition means.

**Response:**

The example provided in the text on page 106 of the Petition is that a three phase AC fault in the Winnipeg area could cause simultaneous commutation failure for all HVDC converter stations in the area. This would be true for all converters that are operating as inverters (converting DC to AC and injecting power into the AC system) at the time of the fault. This is due to a number of factors, including the electrical proximity of the HVDC converter stations and the sensitivity of the converter stations to AC system voltages, especially during a fault and during the post-fault recovery period. Additional HVDC converter stations, especially if developed at locations electrically distinct from the existing Dorsey and Riel converter stations, would increase the complexity of the Winnipeg area transmission system and the likelihood that further developments on the AC system in southern Manitoba would exacerbate commutation failure vulnerability by coupling the converter stations more tightly together.

Response by: Christian Winter\_\_\_\_\_\_\_\_\_\_\_\_\_ List Sources of Information:

Title: Transmission System Planning Engineer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Department: System Performance & Transmission Planning\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Telephone: 218-355-2908\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_