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Xcel Energy

Docket No.: E002, ET2/CN-06-1115

Response To: Elizabeth Goodpaster and Mary Marrow  
Wind on the Wires, et al

Information Request No. 8

Date Received: March 31, 2008

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Question:

- a) Referring to Sec. 6.4.6.2 entitled “Twin Cities – Fargo 345 KV project”, page 6.50, please provide:
- 1) the present NDEX limit;
  - 2) the points at which the NDEX flows are measured; and
  - 3) the increased flows at each measurement point which comprise the 350 MW increase.
- b) If added wind generation in North Dakota exceeds the 350 MW increase, what other facilities will carry the excess?
- c) As the NDEX limit is largely determined by system stability considerations as well as transmission line capability, what stability studies were conducted, and briefly summarize the results.

Response:

a-1) The present North Dakota Export (“NDEX”) limit is 1,951 MW.

a-2) NDEX is the sum of the flows on the following lines:

Audubon – Hubbard 230 kV Line  
Rugby – Glenboro 230 kV Line  
Edgeley – Ordway 115 kV Line  
Forman – Summit 115 kV Line  
Big Stone – Blair 230 kV Line  
Sully Buttes – Oahe 230 kV Line  
Ellendale – Audbon Junction 115 kV Line  
Morris – Granite Falls 230 kV Line

La Porte – Badoura 115 kV Line  
Drayton – Letellier 230 kV Line  
Andelope Valley – Broadland 345 kV Line  
Leland Olds – Fort Thompson 345 kV Line  
Leland Olds – Groton 345 kV Line  
Bison – Maurine 230 kV Line  
Alexandria – Douglas County 115 kV Line  
Canby – Granite Falls 230 kV Line  
Inman – Wing River 230 kV Line  
Kerkhoven – Kerkhoven Tap 115 kV Line

- a-3) As noted, the NDEX is the sum of the line flows identified in part a (2). Flow across NDEX is not apportioned to the lines comprising the NDEX boundary. Rather, consideration with regard to regional stability is only given to the sum of the NDEX flow. Consequently, it is not possible to attribute the anticipated increase in NDEX flow to an increase in flows on any specific line.
- b) This question assumes that more than 350 MW could be added to the system after the CapX2020 345 kV Projects are constructed. The precise increase in NDEX will be determined by future operational reliability studies that will be coordinated by the Northern MAPP Operating Review Working Group. These studies will likely not begin until there is some certainty as to the in-service date of the proposed facilities and will be completed before such facilities are on line. Regardless of how much generation is added or a new NDEX level, it is not reasonably possible to identify how the power flows in the region will be affected given the uncertainty of how much generation might be developed, when and where.
- c) During the dynamic stability review for the TIPS Update, a total of 18 stability contingencies were studied throughout the Upper Midwest. Precise descriptions of these contingencies can be found in Section 4.3 (Page 18) of the TIPS Update (Appendix A-3 of the Application).

The dynamic stability review showed that the addition of the Fargo – St. Cloud 345 kV line resulted in improved system damping and dynamic voltage support when no additional generation is exported across NDEX. Because the existing system is known to be dynamically stable, improved system damping and dynamic voltage support indicates the opportunity to transfer additional generation across NDEX without making the system less reliable than it is today.

Additional stability simulations were performed with a net NDEX increase of 350 MW. It is the results of these simulations that led to the belief that the Twin Cities - Fargo 345 kV line could yield a 350 MW increase in NDEX. Each of the contingencies mentioned above was run with the 350 MW increase in generation. These contingencies were each observed to be stable and did not have any adverse impacts on regional stability.

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