

BEFORE THE MINNESOTA OFFICE OF ADMINISTRATIVE HEARINGS  
600 North Robert Street  
St. Paul, MN 55101

FOR THE MINNESOTA PUBLIC UTILITIES COMMISSION  
121 7<sup>th</sup> Place East, Suite 350  
St Paul MN 55101-2147

IN THE MATTER OF THE  
APPLICATION OF ITC MIDWEST LLC  
FOR A CERTIFICATE OF NEED AND  
ROUTE PERMIT FOR THE  
MINNESOTA-IOWA 345 KV  
TRANSMISSION LINE PROJECT IN  
JACKSON, MARTIN, AND FARIBAULT  
COUNTIES

MPUC Docket No. ET6675/CN-12-1053  
OAH Docket No. 60-2500-30782

**DIRECT TESTIMONY AND ATTACHMENTS OF ADAM J. HEINEN**

**ON BEHALF OF**

**THE MINNESOTA DEPARTMENT OF COMMERCE,  
DIVISION OF ENERGY RESOURCES**

**APRIL 29, 2014**

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1 **I. INTRODUCTION**

2 **Q. What is your name, business address, and occupation?**

3 A. My name is Adam J. Heinen. My business address is 85 Seventh Place East, Suite 500,  
4 Saint Paul, Minnesota, 55101. I am employed as a Public Utilities Rates Analyst with  
5 the Minnesota Department of Commerce, Division of Energy Resources (Department or  
6 DOC).

7  
8 **Q. What are your educational and professional backgrounds?**

9 A. A complete summary of my educational and professional background is presented in  
10 DOC Ex. \_\_\_ AJH-1 (Heinen Direct).

11  
12 **Q. What are your main responsibilities in this proceeding?**

13 A. My responsibility in this proceeding is to review the need analysis associated with ITC  
14 Midwest LLC's, a Michigan limited liability company (ITCM or the Applicant), request  
15 for a certificate of need (CN) for its proposed 345 kilovolt (kV) transmission line and  
16 associated facilities (Project) in Minnesota and Iowa.

17  
18 **Q. Please summarize how your testimony is organized.**

19 A. My testimony is arranged as follows:

- 20 • Project Description and Background;
- 21 • Relevant Minnesota Statutes and Rules;
- 22 • Analysis of Need;
- 23 ○ System Constraints;

- Special Protection Schemes;
  - Locational Marginal Price;
  - Project Area Demand; and
  - Conclusions.
- Summary and Conclusions.

**Q. Do you address all issues associated with this Project in your testimony?**

A. No, I do not. Department Witness Dr. Steve Rakow addresses the policy implications and alternatives analysis for this Project, and Department Witness Mr. Mark Johnson discusses the methods to recover costs associated with the Project.

## **II. PROJECT DESCRIPTION AND BACKGROUND**

**Q. Please provide a description of ITCM's proposed Project.**

A. The proposed Project will expand the existing Lakefield Junction substation for a new 345kV line, construct a new substation near the existing Winnebago Junction substation, construct 75 miles of new 345kV transmission line, re-connect four existing 161kV lines to the new substation near the existing Winnebago Junction substation, and decommission the Winnebago Junction substation. The requested CN is part of the Multi-Value Projects (MVP) portfolio of the Midcontinent Independent Transmission System Operator, Inc. (MISO) and is collectively referred to as MVP3.

1 **Q. What is a Multi-Value Project?**

2 A. An MVP is a proposed transmission project that is designated by MISO as acceptable for  
3 cost sharing across all entities in the MISO footprint because the project provides  
4 sufficient benefit to the overall bulk transmission system and meets three criteria. DOC  
5 Ex. \_\_\_\_ AJH-2 (Heinen Direct). At a high level, the three criteria are:

- 6 1) the project must be developed through the transmission expansion planning  
7 process, enable reliable and economic transmission of energy policy  
8 mandates, and deliver this energy in a more reliable and economic method;
- 9 2) the project must provide multiple types of economic value across the entire  
10 MISO footprint and have a benefit to cost ratio greater than 1.0; and
- 11 3) the project must address at least one transmission issue associated with a  
12 projected reliability violation.

13  
14 **Q. Do you address the cost implications of MVP3 in your testimony?**

15 A. No, I do not. These issues are addressed in the Direct Testimony of Mark Johnson.  
16

17 **Q. Does MVP3 have any relation to other planned transmission projects or is it**  
18 **proposed as an isolated project?**

19 A. Although MVP3 is proposed as a standalone project, it is linked to another planned MVP  
20 in Northern Iowa. Referred to as MVP4, this related project would be connected to the  
21 proposed Project at the Kossuth County Substation in Iowa. MVP4 would be operated by  
22 Mid-American Energy and would consist of 206 miles of 345kV line in Northern Iowa.  
23 Despite being a separate project, MVP4 is important to the Applicant's need analysis for

1 MVP3 in this proceeding. In its need analysis, ITCM bases many of its price, reliability,  
2 and energy deliverability assumptions on the assumed fact that MVP4 is operational in  
3 tandem with MVP3.

### 4 5 **III. RELEVANT MINNESOTA STATUTES AND RULES**

#### 6 **Q. What Minnesota Statutes are associated with your analysis in this proceeding?**

7 A. Minnesota Statutes §216.2421 and §216B.243 govern the requirements for a certificate of  
8 need for a large energy facility (LEF). In terms of high voltage transmission lines, a  
9 project is considered to be an LEF if it is greater than 1,500 feet in length and has a  
10 capacity greater than 200kV. Since the proposed Project is 75 miles long in Minnesota  
11 and 345 kV, a certificate of need is required before construction may begin. In regards to  
12 my analysis, there are two subparts to Minnesota Statute §216B.243 of interest. These  
13 areas are as follows:

14 Subd. 3. **Showing required for construction.** No  
15 proposed large energy facility shall be certified for  
16 construction unless the applicant can show that demand for  
17 electricity cannot be met more cost effectively through  
18 energy conservation and load-management measures and  
19 unless the applicant has otherwise justified its need. In  
20 assessing need, the commission shall evaluate:

21  
22 (1) The accuracy of the long-range energy demand  
23 forecasts on which the necessity for the facility is  
24 based;

25 ...

26 (9) with respect to a high-voltage transmission line, the  
27 benefits of enhanced regional reliability, access, or  
28 deliverability to the extent these factors improve the  
29 robustness of the transmission system or lower costs for  
30 electric consumers in Minnesota.

1 **Q. What Minnesota Rules are associated with your analysis?**

2 A. Minnesota Rule Chapter 7849 governs the provision of data and information associated  
3 with LEFs in a CN proceeding. My testimony will address the following decision criteria  
4 from Minnesota Rules 7849.0120:

5 A certificate of need must be granted to the applicant on  
6 determining that:

7 A. the probable result of denial would be an adverse effect  
8 upon the future adequacy, reliability, or efficiency of  
9 energy supply to the applicant, to the applicant's  
10 customers, or to the people of Minnesota and  
11 neighboring states, considering:

12 (1) the accuracy of the applicant's forecast of demand  
13 for the type of energy that would be supplied by the  
14 proposed facility;  
15

16 **Q. Did the Applicant request any exemptions to its filing requirements?**

17 A. Yes. On December 4, 2012, prior to the filing of its initial application, the Applicant  
18 filed a *Request for Exemptions from Certain CN Application Content Requirements* with  
19 the Commission. ITCM Ex. \_\_\_\_ (Exemption Request). ITCM requested these  
20 exemptions because the required data are not necessarily applicable to ITCM's project  
21 and its operational characteristics. Instead, the Applicant proposed to provide  
22 comparable, substitute, information and data that are more relevant to the details  
23 associated with the proposed Project and the Applicant's business characteristics. On  
24 February 8, 2013, the Commission issued an *Order* granting exemptions to certain filing  
25 requirements in Minnesota Rules. *See* February 8, 2013 *Order* at Page 1; included as  
26 ITCM Ex. \_\_\_\_ Appendix C2 (Initial Petition).

1 **IV. ANALYSIS OF NEED**

2 **Q. Based on your understanding of the application, what is the primary objective of the**  
3 **proposed Project?**

4 A. ITCM stated that the proposed Project, MVP3, is designed to relieve transmission  
5 constraints in the Project area and facilitate the movement of energy associated with  
6 renewable resources to markets outside the Project area. ITCM Ex. \_\_\_ at 5-12 (Berry  
7 Direct). The Applicant also stated that the current transmission structure in the Project  
8 area prevents the placement of additional renewable resources. Further, ITCM explained  
9 that the transmission system in the area of the proposed Project has been constrained and  
10 operating under sub-optimal conditions for an extended period of time. *Id.*

11  
12 A. *SYSTEM CONSTRAINTS*

13 **Q. Does the Applicant quantify the level of constraints that have been present in the**  
14 **proposed Project area?**

15 A. Yes. ITCM included a MISO response to Commission discovery in Docket No.  
16 E001/PA-07-540 which shows all of the binding transmission constraints present on the  
17 ITCM service territory in calendar years 2011 and 2012. ITCM Ex. \_\_\_ at Appendix H  
18 (Initial Petition). The Applicant's review of constraints consisted of analyzing ITCM's  
19 binding constraints which impacted Minnesota load and generation in MISO's Day-  
20 Ahead Energy Market. ITCM identified a total of 261 separate constraints over the two  
21 calendar years. The Applicant also identified the number of hours each constraint was in  
22 place and whether the constraint impacted Minnesota pricing nodes.



1 **Q. Did the Applicant review the binding constraints associated specifically with the**  
2 **Project area in this proceeding?**

3 A. No, it did not. ITCM did, however, provide a name for each constraint; as such, I was  
4 able to estimate the number of constraints, and constraint hours, generally associated with  
5 the Project area. My analysis estimates 12 constraints, for a total of 1,981 hours, in  
6 calendar year 2011 and 3 constraints, for a total of 1,242 hours, in calendar year 2012 for  
7 the Project area. Given the number of hours in these calendar years, I conclude that 2011  
8 had constraints for approximately 23 percent of the hours (1,981/8,760) and 2012 had  
9 constraints for approximately 14 percent of its hours (1,242/8,784; 2012 was a leap year).

10  
11 **Q. What do you conclude after reviewing the information regarding binding**  
12 **constraints?**

13 A. The information provided by the Applicant shows that in recent years there have been a  
14 large number of binding constraints in the Project area. The number, and magnitude, of  
15 constraints suggest that additional transmission capacity is needed in the Project area.  
16 DOC Witness Dr. Rakow analyzes the relative abilities of the proposed Project and  
17 alternatives to relieve the constraints.

18  
19 *B. SPECIAL PROTECTION SCHEMES*

20 **Q. What sub-optimal operational characteristic does the Applicant discuss in its**  
21 **application?**

22 A. ITCM stated in its application that there are currently two Special Protection Schemes  
23 (SPS) on its system in Southwestern Minnesota, the Fieldon Capacitor Bypass (Fieldon)

1 SPS and the Nobles County—Wilmarth (Wilmarth) SPS. ITCM Ex. \_\_\_\_ at Appendix J,  
2 Pages 17-18 (Initial Application). The Applicant explained why an SPS is a sub-optimal  
3 operating condition in the following ways:

4 Generally, an SPS is a remedial operating solution to a  
5 transmission reliability violation, often resulting from the  
6 installation of new facilities which either aggravate or  
7 initiate the violation. SPSs can function well as operational  
8 solutions to address certain transmission deficiencies, but  
9 do not obviate the underlying need for new transmission  
10 facilities. [ITCM Ex. \_\_\_\_ at Appendix J, Pages 17-18  
11 (Initial Application)].

12  
13 ITCM's experience is that SPSs are generally undesirable  
14 because they can lead to exponential growth in demands  
15 placed on the transmission system and create operational  
16 complexities. [ITCM Ex. \_\_\_\_ at Appendix J, Page 18  
17 (Initial Application)].  
18

19 In other words, an SPS allows the transmission system to operate under current  
20 dynamics; however, there is still an underlying issue that should be fixed, at some point,  
21 to ensure future reliability.  
22

23 **Q. How long have the SPS conditions been in place on ITCM's system in Southwestern**  
24 **Minnesota?**

25 A. Based on the information in this record, both SPSs have existed for an extended period of  
26 time. The Fieldon SPS has been in place since 2001 when the Great River Energy (GRE)  
27 Lakefield Junction Station connected to the grid. In addition, the Wilmarth SPS has been  
28 in place since Northern States Power Company installed the Split Rock to Lakefield  
29 345kV line in 2007.

1 **Q. Did ITCM conduct an analysis of the transmission system if the proposed Project is**  
2 **built, and what impact it would have on the existing SPSs?**

3 A. Yes. The Applicant stated that it created a scenario by which MVP3 is added to the  
4 transmission system. Based on this analysis, ITCM stated that its results suggest that  
5 both SPSs would be retired if MVP3 is constructed.

6  
7 **Q. Does ITCM make the final determination of whether an SPS is retired?**

8 A. No, it does not. MISO makes the final determination of whether an SPS should or should  
9 not be retired.

10  
11 **Q. Did you examine any additional information regarding SPSs?**

12 A. Yes. In its annual MISO Transmission Expansion Plan (MTEP) reports, MISO provides  
13 various reliability analyses, including examining SPS conditions. Since ITCM's need  
14 analysis is based, in large part, on information from MTEP11 (included as Appendix I in  
15 the Initial Petition), I also examined information from MTEP12 and MTEP13.

16  
17 **Q. Did you observe any information regarding the SPSs discussed in this proceeding**  
18 **that have appeared to have changed since MTEP11?**

19 A. Perhaps. While reviewing Appendix D3 of MTEP13, I observed that MISO labels the  
20 Lakefield and Wilmarth/Nobles SPSs as Inactive. In response to this observation, I  
21 issued discovery to ITCM. In its response to DOC Information Request No. 33, the  
22 Applicant stated that:

23 ...the term inactive, when referring to an SPS, indicates that  
24 for the particular scenario studied, the contingency

1 simulated does not create an overload that triggers the need  
2 for the SPS, that is, the SPS is not needed to mitigate a  
3 system loading issue under the conditions that were  
4 studied.

5  
6 DOC Ex. \_\_\_\_ AJH-3 (Heinen Direct).  
7  
8

9 **Q. What does the information in your review and the Applicant's response to**  
10 **Department discovery suggest?**

11 A. While it is clear that there has been curtailment in the area, as discussed above, it is  
12 unclear whether there are still reliability concerns to be addressed in the area. As such, I  
13 recommend that ITCM fully explain in its Rebuttal Testimony whether potential  
14 reliability issues still exist in the Project area and, if so, to provide further information of  
15 the reliability concerns.

16  
17 *C. LOCATIONAL MARGINAL PRICE*

18 **Q. Did the Applicant consider, or review, any impacts to energy prices associated with**  
19 **its proposed Project?**

20 A. Yes. Using PROMOD,<sup>1</sup> ITCM conducted an analysis of expected Locational Marginal  
21 Prices (LMP) for Minnesota, and the expected price impacts to Minnesota Load Serving  
22 Entities (LSE), if the proposed Project is constructed. ITCM Ex. \_\_\_\_ at Appendix M  
23 (Initial Application). In this analysis, which included various sensitivity conditions, the  
24 Applicant concluded that the proposed Project would generally decrease energy prices for  
25 the State of Minnesota and Minnesota LSEs. ITCM forecasted potential decreases in  
26 Minnesota LMPs of between \$0.61 per MWh to \$0.90 per MWh.

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<sup>1</sup> PROMOD is a software package that uses detailed generation and transmission system data to estimate various operating conditions and outcomes, including LMPs.

1 **Q. What are Locational Marginal Prices, and what impact do they have on retail**  
2 **electricity customers?**

3 A. Locational Marginal Price is the marginal cost of supplying, at least cost, the next  
4 increment of electric demand (*i.e.*, MW) at a specific location (commonly referred to as a  
5 node) on the electric power network. The price takes into account supply bids  
6 (generation) and demand offers (load) and the various aspects of the transmission system  
7 including operational constraints. LMPs are generally incorporated into the wholesale  
8 rates charged to LSEs, which are then passed on to retail ratepayers through their utility's  
9 monthly fuel cost adjustment on the bill.

10  
11 **Q. Has the Applicant updated its pricing analysis through the course of this**  
12 **proceeding?**

13 A. Yes. The Applicant updated its pricing analysis in response to discovery requests by the  
14 Department. ITCM Ex. \_\_\_\_ at Schedule 2 (Schatzki Direct). This updated analysis was  
15 in response to questions regarding various scenarios that could arise if expected outcomes  
16 in ITCM's base application do not occur (*e.g.*, MVP4 is not constructed).

17  
18 **Q. What does this updated pricing analysis suggest?**

19 A. The updated report suggests that construction of a transmission line in the study area  
20 likely would result in lower LMP prices in Minnesota and for Minnesota LSEs. ITCM  
21 Ex. \_\_\_\_ at Schedule 2 (Schatzki Direct). The updated decrease in prices for the  
22 Applicant's proposed Project (MVP3 and MVP4 both constructed) are slightly lower than  
23 in the Initial Petition, but still result in a decrease in LMPs of between \$0.48 per MWh

1 and \$0.68 per MWh. For the other scenarios the Applicant examined, the decreases in  
2 LMP are not as great as the proposed Project. Also, in all cases, construction of a  
3 transmission line (MVP3 or an alternative) in the Project area would not harm Minnesota  
4 ratepayers through higher LMPs.

5  
6 **Q. What are your conclusions regarding LMPs in this proceeding?**

7 A. Based on the information and analyses in this proceeding, I conclude that construction of  
8 a transmission line (MVP3 or an alternative) in the Project area likely would decrease  
9 LMPs, which would, all else being equal, have a positive impact on Minnesota ratepayers  
10 through lower rates.

11  
12 *D. PROJECT AREA DEMAND*

13 **Q. Did the Applicant provide a forecast of expected demand in the Project area?**

14 A. Yes, it did. In Appendix 53, the Applicant provides forecasts of expected demand for  
15 2018 and 2023 for each of the sub-stations in the Project area. ITCM anticipates an  
16 increase in Project area demand of approximately 40 MW between 2013 and 2023.

17  
18 **Q. Do you have reason to question the reasonableness of these demand forecasts?**

19 A. No, I do not. I have reviewed the projected demand increases and they do not appear to  
20 be unreasonable. ITCM's expected demand forecasts do not appear unreasonable  
21 because, overall, the projected minor increases in demand are consistent with electricity  
22 demand and load growth in southwestern Minnesota.

1 **Q. Do you have any other observations regarding the Applicant's overall demand**  
2 **forecast?**

3 A. Yes. Although the forecast indicates increased demand in the Project area, it is unlikely  
4 that this demand will be served by the Project. In fact, the Applicant stated that this slow  
5 demand growth may exacerbate issues because this demand is not sufficient enough to  
6 utilize wind resources being constructed in the Project area. ITCM Ex. \_\_\_ at Appendix  
7 53 (Initial Petition). Essentially, electric supply exceeds electric demand in southwestern  
8 Minnesota and transmission allows the surplus generation to be exported to other areas.  
9 Therefore, increases in demand in the Project area would decrease the need for  
10 transmission and the associated export capacity.

11 As noted by ITCM, the purpose of this Project is to relieve the existing capacity  
12 constraint, improve the ability of renewable generation capacity to reach energy markets  
13 further east, and, subsequently, reduce LMPs in Minnesota. Ultimately, the question of  
14 need is related more to the ability of Project to improve deliverability and relieve any  
15 existing reliability conditions in Minnesota, as explained above.

16  
17 *E. CONCLUSIONS*

18 **Q. Based on your review, do you believe need exists for this Project?**

19 A. Based on my review, I conclude that construction of a new transmission line is  
20 appropriate and needed. Based on the information provided by ITCM, it appears that  
21 construction of a transmission line (MVP3 or an alternative) in the study area would  
22 result in increased deliverability to other markets in MISO and would result in decreased  
23 LMPs for Minnesota retail customers. It is, however, unclear at this time whether the

1 proposed Project would improve transmission system reliability; therefore, I have  
2 requested that the Applicant address this issue in detail in its Rebuttal Testimony.

3  
4 **Q. Do you make any recommendations regarding whether the proposed Project or an  
5 alternative is appropriate?**

6 A. No, I do not. Dr. Rakow presents the Department's analysis regarding the appropriate  
7 size, type and timing of facilities including alternatives.

8  
9 **V. CONCLUSIONS AND RECOMMENDATIONS**

10 **Q. What are your conclusions regarding the need for this Project?**

11 A. Based on my review of the information in this proceeding, I conclude that construction of  
12 a transmission line in the Project area would likely improve deliverability and reduce  
13 constraints on the transmission system. There are, however, questions regarding  
14 reliability issues in the Project area which I have asked the Applicant to address in  
15 Rebuttal Testimony. The appropriate size, and type, of transmission line to construct is  
16 unclear, and the Department's review of alternatives in this proceeding is discussed in the  
17 Direct Testimony of Dr. Steve Rakow.

18  
19 **Q. Do you have any additional recommendations?**

20 A. Yes. I recommend that ITCM provide a full explanation of how MTEP13 Appendix D3  
21 relates to DOC Information Request No. 33 and whether potential reliability issues still  
22 exist in the Project area.



1 | **Q. Does this conclude your Direct Testimony?**

2 | A. Yes.