

PUBLIC VOLUME

ATTACHMENT B

AFFIDAVIT OF MR. DANIEL P. KLINE

Madison area, wholly in Wisconsin; (2) the common endpoint for the La Crosse – Madison Line and the 345 kV line from the Twin Cities to La Crosse (the “Twin Cities – La Crosse Project”) that is currently being permitted before the Public Service Commission of Wisconsin (“PSCW”); (3) the Midwest Independent Transmission System Operator, Inc.’s (“MISO”) regional planning process that concluded that the La Crosse – Madison Line is to interconnect with NSPW’s facilities; and (4) the calculation of potential economic harm to the NSP Companies if ATC’s unwillingness to negotiate mutually agreeable ownership arrangements under the Agreement of the Transmission Facilities Owners to Organize the Midwest Independent Transmission System Operator, Inc. (“TOA”) and the MISO Open Access Transmission, Energy and Operating Reserve Markets Tariff (“MISO Tariff”) goes unremedied.

5. As Manager, Regulatory Administration, I am responsible for activities that relate to Xcel Energy’s transmission function. This includes developing company policy as it relates to Federal Energy Regulatory Commission (“FERC” or the “Commission”) orders; developing policies and interventions in FERC dockets; and coordinating the Xcel Energy Operating Companies participation in their respective regional organizations, chiefly MISO, Southwest Power Pool, Inc. (“SPP”), and WestConnect. I am also responsible for coordinating compliance efforts associated with the Xcel Energy Operating Companies Open Access Transmission Tariff. In addition to my duties at XES, I am also the chair of MISO’s Regional Expansion Criteria and Benefits (“RECB”) Task Force, the stakeholder committee responsible for developing the organization’s cost allocation policy. As part of this work, I have also been involved in the development and analysis of the rate treatment for new transmission facilities, including for those transmission facilities that will receive cost allocation treatment as a Multi Value Project (“MVP”) under the MISO Tariff, such as the La Crosse – Madison Line.
6. Prior to my current position, I was a Senior Engineer, Regional Transmission Planning for XES. As a Senior Engineer, my duties included coordinating the participation of all MISO Transmission Owners (“TOs”) in the MISO Planning Advisory Committee (“PAC”), which is the MISO committee responsible for developing MISO’s regional planning document, the Midwest ISO Transmission Expansion Plan (“MTEP”). The MTEP is the culmination of the regional planning process adopted pursuant to the Commission’s Order No. 890, documented in Attachment FF to the MISO Tariff. In my role as Senior Engineer, my responsibilities included guiding contemplated transmission projects through the MISO transmission planning process and working for their inclusion in the MTEP. In addition, I assisted in preparation of the biennial transmission planning reports submitted by the Minnesota Transmission Owners (“MTO”), including Northern States Power Company, a Minnesota corporation (“NSPM”) and ATC, to the Minnesota Public Utilities Commission (“MPUC”).
7. Prior to my role as a Senior Engineer, I was a Transmission Planning Engineer for NSPW and NSPM (together the “NSP Companies”). The NSP Companies operate an integrated electric system (the “NSP System”) serving portions of Minnesota, North Dakota, South Dakota, Wisconsin and the Upper Peninsula of Michigan. The NSP System is planned and operated on a single system basis. In my affidavit, I will refer to NSPW, NSPM and XES jointly as “Xcel Energy”.

8. Through my employment with Xcel Energy, I have become familiar with the workings of the MISO planning process and the history of development of transmission in the upper-Midwest, including development of a long sought after second transmission link between the Twin Cities area in Minnesota and eastern Wisconsin. There is presently a single extra high voltage transmission line from the Twin Cities to eastern Wisconsin, the so-called King – Eau Claire – Arpin – Rocky Run 345 kV line, plus certain lower voltage facilities. As a result, there has long been a “constrained interface” between the NSP System and utilities to the west and north in the historic Mid-Continent Area Power Pool (“MAPP”) region, and loads and generation in the eastern portions of Wisconsin, which are now served by the ATC transmission system. The constrained interface both limits the ability for lower cost energy resources to flow from generation to loads, and creates system reliability issues, particularly in terms of system stability, during either switching or outages (planned or unplanned) on the King – Eau Claire – Arpin – Rocky Run line. The NSP Companies own the portion of the King – Eau Claire – Arpin – Rocky Run line from the A.S. King substation to the Arpin substation (approximately 183 miles), and ATC owns the portion from near Arpin Substation to the rest of the ATC system. At present, the only connection from Arpin Substation to the Madison area is a circuitous path that results in a weak connection.

Development of the La-Crosse Madison Line

9. A new high-voltage transmission link between the Twin Cities area in Minnesota to the Madison area in Wisconsin was studied as early as 1999, prior to the formation of ATC, as part of the Wisconsin Interface Reliability Enhancement, Phase II, Study (“WIRES Phase II Report”) efforts. The WIRES Phase II Report is provided as Attachment D to the Complaint.
10. The WIRES Phase II Report identified a transmission line from the NSPM Prairie Island Substation, southeast of the Twin Cities, to the Columbia Substation, just north of the Madison area and then owned by one of ATC’s predecessor owners, as a project that would address certain stability issues in the Minnesota-Wisconsin transmission interface, that arise when the King—Eau Claire – Arpin – Rocky Run 345 kV line is switched. This Prairie Island – Columbia line was one of several alternatives identified in the WIRES Phase II Report to mitigate this reliability issue. Of the identified alternatives, the Arrowhead – Westin 345 kV Line was ultimately constructed. The Arrowhead – Westin line runs from north of Duluth, Minnesota, to near Madison, and is owned by ATC.
11. Northern States Power Company, the predecessor to NSPW’s parent company, Xcel Energy Inc., was a participant in the WIRES Phase II Report.
12. A La Crosse to Madison transmission link was also proposed by the CapX2020 Initiative as part of their vision study work culminating in the 2005 CapX2020 Vision Study. While Xcel Energy personnel were leaders in the Vision Study, representatives of the other CapX2020 participants worked collaboratively on the Vision Study. The CapX2020 Vision Study is provided as Attachment E to the Complaint.

13. The CapX2020 Initiative is a collaboration of 11 utilities in the upper-Midwest that was formed to study and propose transmission projects necessary to meet the needs of the region through 2020. The utilities participating in the CapX2020 Initiative are: Central Minnesota Municipal Power Agency; Dairyland Power Cooperative (“DPC”); Great River Energy; Minnesota Power; Minnkota Power Cooperative; Missouri River Energy Services; Otter Tail Power Company; Rochester Public Utilities; Southern Minnesota Municipal Power Agency; WPPI Energy (“WPPI”); and the NSP Companies.
14. The CapX2020 Vision Study identified transmission facilities electrically similar to the Prairie Island – Columbia transmission line identified in the WIRES Phase II Report. The CapX2020 Vision Study identified a 345 kV transmission line from a substation near the Prairie Island generating station in the Twin Cities area to a substation in the La Crosse area as the first phase. The CapX2020 Vision Study also identified a second phase: an additional 345 kV transmission line extending from the end point of the first phase to the Columbia Substation near Madison (now owned by ATC).
15. Based on the results of the CapX2020 Vision Study, the CapX2020 utilities started earnest planning of the Twin Cities – La Crosse transmission facility identified in the Vision Study. This scoping work culminated in the Twin Cities – La Crosse Project, a 345 kV transmission line from the NSPM Hampton Corner substation, south of the Twin Cities, to the new NSPW Briggs Road Substation north of La Crosse, Wisconsin. The Twin Cities – La Crosse line (also referred to as “Hampton – La Crosse”) was initially reviewed by MISO in MTEP07, and was approved by the independent MISO Board of Directors in MTEP08. This project pre-dates the provisions of the MISO Tariff providing for an MVP designation for certain transmission projects, but the Twin Cities – La Crosse Project was found to provide regional reliability benefits and was designated as a “Baseline Reliability” project in MTEP08 pursuant to the then applicable provisions of Attachment FF of the MISO Tariff. The planned in-service date was 2015.
16. A new Briggs Road Substation was proposed to be constructed as the eastern endpoint of the Twin Cities – La Crosse Project and is being designed to serve as the western endpoint for the La Crosse – Madison Line. In essence, the Briggs Road Substation is intended to serve as the best-available middle connection for the Twin Cities to Madison transmission link, which will be developed in two phases.
17. The new Briggs Road Substation is electrically identical to the previously-studied North La Crosse Substation used as a proxy in all study work identifying a Twin Cities – La Crosse – Madison transmission link.
18. The Minnesota portion of the Twin Cities – La Crosse Project received a Certificate of Need (“CON”) from the Minnesota Public Utilities Commission (“MPUC”) in May 2009; and on February 8, 2012, an Administrative Law Judge issued findings of fact recommending a specific route in Minnesota. The recommended route will now be considered by the MPUC. The Wisconsin portion of the Twin Cities – La Crosse Project is currently in the permitting process before the Public Service Commission of Wisconsin (“PSCW”) in Docket No. 5-CE-134. The CapX2020 participants in the project (NSP, DPC and WPPI) have filed for a Certificate of Public Convenience and Necessity

(“CPCN”), a process that considers both the need and route for a proposed transmission project. The project is proposed to terminate at the Briggs Road Substation, to be wholly owned by NSPW.

19. The Twin Cities – La Crosse Project was pursued separately from the La Crosse – Madison transmission link due to study work that identified the need for nearer-term reliability enhancements in the areas of Rochester and La Crosse. The ability for the project to connect to a future La Crosse – Madison transmission line was one factor in the 345 kV design of the Twin Cities – La Crosse line.
20. The NSP Companies were the lead utility for the CapX2020 Vision Study. ATC participated in the CapX2020 Vision Study. I was an active participant in the CapX2020 Technical Team on behalf of the NSP Companies, and am aware of the various transmission planning studies and recommendations for specific projects in the Vision Study.
21. The need for a La Crosse area to Madison area transmission line was also identified in the Minnesota RES Update Study (“RES Update”) in 2009, submitted to the MPUC as part of the 2009 Biennial Transmission Projects Report. The RES Update was a study performed collaboratively by various owners of transmission facilities in Minnesota, known as the Minnesota Transmission Owners (“MTO”) group. The MTO members were: ATC, Basin Electric Power Cooperative, Central Minnesota Municipal Power Agency, Dairyland Power Cooperative, Great River Energy, Heartland Consumers Power District, Interstate Power and Light, Minnesota Municipal Power Agency, Minnesota Power, Minnkota Power Cooperative, Missouri River Energy Services, Otter Tail Power Company, Rochester Public Utilities, Southern Minnesota Municipal Power Agency, Willmar Public Utilities, and NSP. The RES Update was performed so the MTO could identify transmission upgrades necessary for Minnesota electric utilities to meet their state-imposed renewable energy portfolio standards. Like the CapX2020 Vision Study, the RES Update concluded that a new high-voltage transmission facility is necessary between the La Crosse area and eastern Wisconsin to ensure reliable operation and full dispatch of new generation resources. Specifically, this study identified the installation of a project substantially similar to the La Crosse – Madison Line, which was shown to provide significant benefits in all cases studied, as the appropriate facility to provide this link. The RES Update is provided as Attachment F to the Complaint.
22. The NSP Companies were an active participant and leader in the study work culminating in the RES Update. I personally directed the study work on behalf of the NSP Companies and am aware of the studies and recommendations for specific projects.
23. While the study work to that point had clearly identified the La Crosse area connection of the La Crosse – Madison line, such an identification had not been performed for the connection in the Madison area. To provide a more granular level study for the eastern end point of the overall Twin Cities – La Crosse – Madison connection, a separate study was commissioned.

24. Due to its familiarity with the transmission system in eastern portion of the study area, ATC was selected to be the lead utility for this more granular study work. Xcel Energy was an active participant in this study work, however.
25. The additional study work culminated in the 2010 Western Wisconsin Transmission Reliability Study (“WWTRS”). The WWTRS assessed the reliability needs in western Wisconsin in the eight- to ten-year out time frame, and also evaluated the extent to which different transmission options would meet these needs using various reliability measures. The WWTRS is provided as Attachment G to the Complaint.
26. The WWTRS concluded that the La Crosse – North Madison – Cardinal and the Dubuque – Spring Green – Cardinal 345 kV Projects would provide the best reliability benefits in Wisconsin and would provide additional load serving benefits, energy and loss savings and other economic and policy benefits such as the ability to integrate and deliver renewable energy.
27. Based in part on the outcome of the WWTRS, the La Crosse – Madison Line and the other aspects studied in the WWTRS projects were designated as a candidate Multi Value Projects (“Candidate MVPs”) by MISO, subject to further study. These projects were then designated as MVPs by the MISO Board of Directors on December 8, 2011.
28. The La Crosse – Madison Line constitutes the portion of the La Crosse – North Madison – Cardinal Project that extends from NSPW’s proposed Briggs Road Substation in the La Crosse area to ATC’s North Madison substation in the Madison area.
29. The WWTRS report characterizes the La Crosse – Madison Line as “extending” the Twin Cities – La Crosse Project and also “connecting” to the Twin Cities – La Crosse Project. This study work concludes that the La Crosse – Madison Line was studied to be an extension of the CapX2020 Twin Cities – La Crosse Project. This viewpoint is supported by MISO’s MVP analysis, which identified the La Crosse – Madison Line as connecting to the Twin Cities – La Crosse Line (seemingly at the Briggs Road Substation) and then extending eastward to ATC’s North Madison Substation. In fact, the additional substation equipment that needs to be installed at the Briggs Road Substation to accept the 345 kV circuit of the La Crosse – Madison Line is included in the project description and is eligible for broad based MVP cost sharing as part of the approval of the La Crosse – Madison Line in the 2011 MTEP (“MTEP11”).

The Presumptive End Point

30. The WWTRS and the MISO MVP study work both concluded that the NSPW Briggs Road Substation is the appropriate “North La Crosse” connection between the Twin Cities – La Crosse Project and the La Crosse – Madison Line.
31. The NSPW Briggs Road Substation is identified as the an endpoint of the La Crosse – Madison Line in MTEP11, and as described above, the additional equipment needed at the Briggs Road Substation to accept the 345 kV circuit of the La Crosse – Madison Line are included in the MVP designation of the La Crosse – Madison Line.

32. The exact location of where the Twin Cities – La Crosse Line terminates and the La Crosse – Madison Line begins is less important than the fact that the two projects must begin and end at the same place to obtain the benefits inherent in the projects and to avoid duplication of facilities. The MISO Candidate MVP studies resulted in approval of La Crosse – Madison as an MVP. Thus, even if the specific location of the interconnecting substation is changed in the PSCW CPCN process for Twin Cities – La Crosse, the fact remains that the La Crosse – Madison 345 kV Line needs to interconnect with the Twin Cities – La Crosse Line in order to achieve the east-west benefits consistently studied over the past decade and which allowed the La Crosse – Madison Line to satisfy the multiple criteria for designation as an MVP in MTEP11.
33. While the precise configuration of both the Twin Cities – La Crosse Project and the La Crosse – Madison Line will be determined by the PSCW through its CPCN transmission facility permitting process, my engineering judgment is that if the La Crosse – Madison Line interconnects to the Twin Cities – La Crosse Project at some point other than the Briggs Road Substation, there would be diminished load serving benefits to the La Crosse area.
34. Serving the La Crosse area through a lower voltage or radial line will require additional, and duplicative, facilities to ultimately connect that radial circuit to the La Crosse – Madison Line at some point in the future when load serving needs require it. By connecting the La Crosse – Madison Line to the Twin Cities – La Crosse Project at the Briggs Road Substation, no duplicate facilities will be needed since the final segment of the Twin Cities – La Crosse Project will not be radial. This is one reason all the study work identifies the La Crosse – Madison Line as extending the Twin Cities – La Crosse Project from a common endpoint.
35. In any case, even if the PSCW decides to move the connection between the two lines to a different point, the 345 kV connection from the La Crosse area to Madison must connect directly with the 345 kV line from the Twin Cities to La Crosse in order to obtain the reliability and energy transfer benefits of a 345 kV connection between the two systems.

MISO Planning Process

36. MISO employs a “top down, bottom up” planning approach. This means that the MISO planning process is designed to integrate planning at the regional level with the local planning processes of the TOs to ensure that all necessary facilities are built to ensure a reliable and economic transmission system.
37. This planning approach is the basis of the MISO Tariff’s planning provisions provided for in Attachment FF of the Tariff as required by Order No. 890.
38. As part of the “bottom up” planning approach, and in accordance with the Transmission Owner’s Agreement between the MISO TOs, each TO engages in local system planning in order to carry out its responsibilities for meeting its respective transmission needs in collaboration with MISO and subject to the requirements of applicable state law or regulatory authority.

39. The NSP Companies have integrated their local planning processes into MISO's larger planning effort.
40. As part of this integrated process, the NSP Companies work collaboratively with other MTO utilities to determine the transmission facilities that may be needed in the future to meet its load serving and reliability requirements and provides its analysis to MISO. The Minnesota utilities collaborate to perform an annual analysis of the transmission system's ability to meet applicable North American Electric Reliability Corporation ("NERC") standards and identifies projects based on the results of that study. The results of this study (as well as any more focused studies that are necessary) are submitted to MISO. MISO then takes all of the local plans from the TOs that have integrated their local planning into MISO's planning efforts and performs a regional analysis to determine what transmission facilities are necessary to provide optimal and non-duplicative solutions for all of the TOs.
41. ATC does its local planning pursuant to the terms of Attachment FF-ATCLLC of the MISO Tariff. Once ATC has identified the transmission facilities that its local planning process has identified as being necessary, these projects are then integrated into MISO's regional planning process to ensure an optimal and non-duplicative series of transmission projects are ultimately approved to be constructed.
42. I note that as part of its local planning process, Attachment FF-ATCLLC of the MISO Tariff requires ATC to hold a yearly meeting with MISO TOs who may be affected by ATC's local planning to ensure that ATC's local planning is properly coordinated with the planning efforts of the neighboring TOs. It was at such a meeting in October 2010, when I and other Xcel Energy transmission personnel in attendance learned that ATC intended to own 100 percent of the La Crosse – Madison project. Xcel Energy personnel objected to the characterization of the Project as an ATC-owned project, and notified the ATC personnel in attendance that NSPW intended to fulfill its ownership obligations under the TOA for the La Crosse – Madison Line.
43. To coordinate all of the local planning requirements and receive stakeholder feedback, TOs participate in Subregional Planning Meetings ("SPM") in their respective planning subregions pursuant to a schedule provided by MISO. At these SPMs, TOs may be requested to present their proposed projects to stakeholders and discuss the justification, alternatives, estimated costs, expected in-service dates, and other aspects of proposed projects.
44. MISO also manages the planning process from a "top down" approach. Through this "top down" approach MISO, through the regional planning process, integrates the local planning processes of its TOs and the advice and guidance of stakeholders into a coordinated regional transmission plan and identifies additional expansions as needed to provide for an efficient and reliable transmission system. In other words, MISO, in collaboration with its Transmission Owning Members, is ultimately responsible for integrating all local planning process to ensure that broad based regional solutions are identified.

45. MISO coordinates its “top down” planning responsibilities through the Planning Advisory Committee (“PAC”) in which all MISO stakeholders may participate and which reviews and recommends transmission projects for inclusion in the MTEP, which must be approved by the independent MISO Board of Directors.
46. The day-to-day planning work is coordinated by MISO through its planning staff. The planning staff work with the TOs and other stakeholders to solicit information and create the models used in planning. Oftentimes, the work of the MISO planning staff is in collaboration with the representatives of the TOs.
47. The collaboration is often done informally. For example, MISO will often solicit information from the TOs via email to particular engineers working on a particular project. This includes cost estimates and other system information for which a particular engineer may be knowledgeable. This informal, collaborative process allows MISO to efficiently perform its planning work subject to the more formal oversight of the SPMs and the PAC.
48. The ultimate outcome of these planning efforts is the MTEP. The MTEP uses an iterative process to identify which transmission projects will ensure an efficient and reliable transmission system by using the different appendices of the MTEP to identify and winnow projects.
49. There are three appendices to the MTEP: Appendix A; Appendix B; and Appendix C. As projects are further developed and refined they move from Appendix C (conceptual projects) to Appendix B (potential projects) and ultimately into Appendix A (approved projects).
50. Appendix C projects are projects which are proposed by a TO, stakeholders, or MISO staff for which specific needs have not been established but that are thought to be a potentially beneficial expansion. All newly proposed projects start as Appendix C projects in the MTEP process.
51. Appendix B projects are those that are demonstrated to be a potential solution to an identified reliability, policy or other need or benefit. Oftentimes, when a need is identified, Appendix C projects are then tested to determine if they help to meet that need. Several solutions to the same need may be included in Appendix B until the preferred solution among alternatives is selected.
52. Appendix A projects are projects that have been justified to be the preferred solution to an identified need and have been approved by the MISO Board of Directors. Once a project is approved by the Board of Directors as an Appendix A project, the project must be implemented by one or more assigned TOs. Implementation of an Appendix A project is assumed in modeling for subsequent planning cycles.
53. As noted, the Twin Cities – La Crosse line was approved in MTEP08. The La Crosse – Madison Line, by contrast, was initially considered as an Appendix C project in MTEP09 and considered as an Appendix B project in MTEP10. The La Crosse – Madison Line was designated in MTEP11 as an Appendix A project on December 8, 2011. The

MTEP11 report approved by the MISO Board assumes the line will interconnect with the CapX2020 Twin Cities – La Crosse Line at the interconnection point between the two lines, namely the proposed NSPW Briggs Road Substation.

54. Xcel Energy has been actively involved in the transmission planning process, including the MISO MTEP process, associated with the La Crosse – Madison Line for more than a decade. The La Crosse – Madison Project has been planned to interconnect at the Briggs Road Substation to be owned by NSPW.

Harm to Xcel Energy and NSPW

55. As indicated above the NSP Companies have transferred functional control of the bulk of their transmission facilities to MISO. Consequently, for wholesale transmission services, the NSP Companies earn their Commission authorized rate of return on these assets pursuant to the MISO Tariff.
56. As an MVP, transmission charges for the La Crosse – Madison Line will generally be allocated to load within the MISO footprint on a load share basis. These transmission charges will be calculated pursuant to Attachment MM of the MISO Tariff and collected pursuant to Schedule 26-A of the MISO Tariff.
57. As NSPW is obligated to share equally in the costs of the La Crosse – Madison Line, NSPW has estimated its share of the line to cost approximately \$175 million and be placed in service in 2018. The estimated fixed charge rate factor for NSPW transmission assets is approximately 16 percent.

[SIGNATURE PAGE FOLLOWS]

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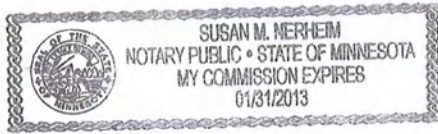


Daniel P. Kline, P.E.

Subscribed and sworn to before me

this 10th day of February, 2012

Susan M. Nerheim
Notary Public



SCHEDULE 1 TO AFFIDAVIT OF MR. DANIEL P. KLINE

CURRICULUM VITAE

Daniel Kline, P.E.

- Summary** **Licensed professional engineer with ten years' experience** in transmission planning, regulatory process, and project leadership ranging geographically from single cities to large multi-state regions with utilities across the country and around the world
- Education** **Master of Engineering in Engineering Management** | University of Idaho | Moscow, ID
Bachelor of Science in Electrical Engineering | Iowa State University | Ames, IA
- Experience**
- 02/11 to Present* *Xcel Energy Services Inc.* *Minneapolis, MN*
Manager, Regulatory Administration (Transmission)
- Manage department responsible for oversight of federal transmission tariff policy
 - Oversee company's compliance with federal transmission regulations; identify weaknesses and develop plans to correct those weaknesses
 - Represent MISO utilities in regional cost allocation discussions as vice-chair of cost allocation task force
 - Develop relationships with neighboring utilities to help company meet its transmission needs
 - Negotiate transmission interconnection terms with neighboring utilities to further company transmission policy goals
 - Coordinate Xcel Energy involvement in regional organizations
 - Facilitate development of company policy on FERC Orders and develop interventions in FERC dockets
 - Participate in due diligence review of new transmission projects
 - Vice-Chair, MISO RECB Task Force, 2011
 - Chair, MISO RECB Task Force, 2012
- 04/09 to 02/11* *Xcel Energy Services Inc.* *Minneapolis, MN*
Senior Engineer, Regional Transmission Planning
- Coordinate involvement of Xcel Energy planning department in regional cost allocation discussions; develop guiding principles, determine how those principles apply in the framework of regional discussions, and negotiate with other stakeholders to find common ground
 - Coordinate participation of all Midwest ISO transmission owners in Planning Advisory Committee
 - Represent Xcel Energy in discussions for Upper Midwest Transmission Development Initiative (UMTDI)
 - Oversee Xcel Energy participation in Strategic Midwest Area Renewable Transmission (SMART) Study; review study models, shape study assumptions, develop study alternatives
 - Manage Xcel Energy participation in regional transmission "seams" issues, including interface with utilities in Canada, North Dakota, South Dakota, and Wisconsin
 - Assess FERC rulings and provide input from planning into Company and transmission owner interventions
 - Participate in development of regulatory strategy, draft testimony, and testify before Minnesota Public Utilities Commission in line route proceeding for multi-state 345 kV line
 - Draft and review filings and responses to Federal Energy Regulatory Commission matters related to transmission planning, system reliability, and energy markets
- 02/06 to 04/09* *Northern States Power Co. (Minnesota)* *Minneapolis, MN*
Transmission Planning Engineer
- Oversee completion of 10-year plan for Xcel Energy's entire Wisconsin service territory. Coordinate and focus efforts of other engineers to complete this work

- Manage study of upper Midwest region focused on identifying necessary electric transmission infrastructure to meet 2016 renewable energy standard milestone. Assist in developing necessary regulatory filings
- Lead the technical analysis and development of a 250-mile, 345 kV transmission line from Fargo, North Dakota to Monticello Generating Plant with capital expenditures of approximately \$500 million dollars and assist with necessary regulatory filings
- Guide projects to inclusion in Midwest ISO Transmission Expansion Plan (MTEP)
- Complete focused study to develop long-term planning solutions for two areas in Wisconsin; resulting projects represent approximately ten years and \$35 million worth of capital improvements
- Develop technical regulatory requirements for permit applications in Wisconsin
- Represent Xcel Energy at public meetings to increase awareness of and public involvement in the transmission planning process
- Review and respond to MRO Standards changes with respect to their effect on Xcel Energy
- Represent Xcel Energy to third-parties and the Midwest ISO during generation interconnection proceedings
- Analyze transmission projects being completed by outside utilities and their effect on Xcel Energy's transmission grid
- Perform analysis of requested transmission interconnections and report on their effect on the transmission network
- Coordinate implementation of projects with internal and external customers, including consultants, project managers, community members, and contractors
- Participate in review and markup of new regulations and interpretations of NERC and MRO system performance standards

07/04 to 02/06

Open Systems International, Inc.

Plymouth, MN

Power Systems Engineer

- Analyze customer requirements, created a product implementation plan for Power Systems applications on customer projects, took responsibility for implementing that plan
- Ensure the customer was thoroughly trained in the effective use of the applications they purchased
- Perform Factory Acceptance Testing with the customer
- Plan and implemented the proper commissioning strategy for the applications at a customer site after system installation, ensuring the complete implementation of the application products
- Act as a customer advocate by proposing software enhancements, monitoring software development, and advising OSI management of customer-desired features
- Manage development of Java-based power system applications by tracking and scheduling necessary software upgrades
- Create and verify power flow model for large, interconnected electrical utility
- Configure and tested a variety of applications, ranging from AGC to power flow (transmission and distribution) to geographical information systems
- Present training sessions and workshops to users both familiar with and new to OSI products
- Oversee implementation of software to integrate customer computer systems with Midwest ISO market dispatch program
- Review and comment on FERC filings related to Midwest ISO wholesale electricity market implementation

07/03 to 07/04

Pacific Gas & Electric Company

San Francisco, CA

Associate Transmission Planning Engineer

- Assess transmission grid weaknesses on ten-year horizon for four PG&E territories and more than 5500 MW of customer load
- Assist with development of state permit filings for 20-mile urban 230 kV transmission line

- Review Nuclear Regulatory Commission voltage stability requirements and study long-term voltage stability in area around Diablo Canyon Nuclear Power Plant; recommend projects to address long-term deficiencies
- Correspond with California Independent System Operator (ISO) as point of contact for issues related to reliable system operation
- Propose and obtained funding for \$12 million 230/115 kV, 420 MVA transformer installation
- Present Transmission Grid Expansion Plan Proposal to a group consisting of ISO members, independent power producers, municipal utility representatives, engineering consultants, environmental groups, and consumer watch groups
- Conduct long-term voltage reliability study of Bay Area for various critical contingencies. Results of study were used to determine Bay Area transmission projects over ten year horizon.

03/01 to 08/07

P & E Engineering Co.

Carlisle, IA

Electrical Engineer

- Analyze FERC requirements on wind generation facilities and perform voltage and power flow analysis on 34.5kV and 24.9kV collector systems for wind farms in Iowa, North Dakota, Oklahoma, and New Mexico
- Model large fossil fuel power plant from 345kV level to 480V motor control centers to initiate coordination study for entire substation
- Conduct transmission planning study for municipal electrical utility resulting in suggested system enhancements and presentation to board of directors; analyze NERC standards, determine their applicability to customer system, and make project recommendations that ensure continued compliance with NERC standards

05/00 to 01/03

MidAmerican Energy Company

Urbandale, IA

Energy Management System Associate

- Prepare energy management system database for conversion to upgrades system
- Maintain energy management system at a high level of availability
- Develop and implement plan to update system mapboard showing real-time status of transmission lines and generators
- Review planned transmission system outages and participate in analysis of their applicability to MAPP and MRO standards
- Review recommended changes to NERC operational standards and requirements and analyze system's ability to meet those requirements

**Honors
Associations**

- & Eagle Scout Award Recipient
- American Legion Boy's State Attendee
- Member, Institute of Electrical and Electronics Engineers, 2003 to 2011
- Senior Member, Institute of Electrical and Electronics Engineers, 2011 to Present
- Author, "Conducting a Multi-Region Transmission Analysis", *IEEE Panel Presentation, 2011 General Meeting*