STATE OF MINNESOTA

OFFICE OF ADMINISTRATIVE HEARINGS FOR THE PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE ROUTE
PERMIT APPLICATION FOR THE
CAPX2020 HAMPTON – ROCHESTER –
LA CROSSE 345 KV TRANSMISSION
LINE

PUC DOCKET NO. E002/TL-09-1448 OAH DOCKET NO. 7-2500-20283-2

DIRECT TESTIMONY OF

GRANT STEVENSON

On Behalf of

APPLICANT

NORTHERN STATES POWER COMPANY, A MINNESOTA CORPORATION

April 18, 2011

Exhibit _____

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1		I. INTRODUCTION AND QUALIFICATIONS
2		
3	Q.	STATE YOUR NAME AND BUSINESS ADDRESS.
4	Α.	My name is Grant Stevenson and my business address is 414 Nicollet Mall,
5		Minneapolis, MN 55401.
6		
7	Q.	BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION?
8	Α.	I am employed as a Senior Transmission Project Manager at Xcel Energy
9		Services Inc., the service company provider for Northern States Power
0		Company, a Minnesota corporation ("Xcel Energy" or the "Company"). As
1		part of my responsibilities in this position, I am the project manager for the
12		Hampton to Rochester to La Crosse 345 kilovolt ("kV") Transmission Project
13		("Hampton - Rochester - La Crosse Project" or "Project") and am primarily
14		responsible for capital project scope, cost, schedule, and risk management of
15		the Project.
16		
17	Q.	PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL EXPERIENCE.
18	Α.	I graduated from the University of Minnesota in 1986 with a Bachelor's degree
9		in Mechanical Engineering. After graduation, I joined Northern States Power
20		Company as a Mechanical Engineer at the Sherburne County generating plant
21		in Becker, Minnesota. I was responsible for managing projects to improve
22		productivity, efficiency, and safety at the company's largest generating plant. I
23		also managed contractors, plant operations, maintenance, and technical
24		personnel. Since 1986, I have held positions with Xcel Energy with increasing
25		responsibility.

1		
2		I became a Transmission Project Manager in September 2000. In my role as
3		Transmission Project Manager, I was a project manager for Xcel Energy's 825
4		megawatt ("MW") wind outlet transmission projects in southwestern
5		Minnesota from 2003 until 2006. The project included more than 500 miles of
6		transmission lines and affected 29 substations. In August 2006, I was
7		promoted to Senior Transmission Project Manager. This is the fifth
8		transmission line proceeding I have participated in. My resume is attached as
9		Schedule 1.
0		
1	Q.	FOR WHOM ARE YOU TESTIFYING?
12	Α.	I am providing testimony on behalf of Xcel Energy, the Applicant for a Route
13		Permit in this proceeding.
14		
15	Q.	WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?
16	Α.	The purpose of my testimony is to provide information regarding the Project,
17		including engineering design, costs and schedule.
18		
19	Q.	WERE YOU INVOLVED IN THE PREPARATION OF XCEL ENERGY'S ROUTE
20		PERMIT APPLICATION IN THIS PROCEEDING?
21	Α.	Yes. I contributed to the engineering and project management sections of the
22		Route Permit Application ("Application") and was involved in the routing
23		analysis and development. I have participated in all aspects of the Project's
24		public outreach, including public open houses, agency meetings, the
25		Department of Commerce scoping meetings and advisory task force meetings.

1		
2		
3	Q.	WHAT SCHEDULES ARE ATTACHED TO YOUR TESTIMONY?
4	Α.	Schedule 1: Resume of Grant Stevenson
5		
6	Q.	ARE YOU AVAILABLE TO PROVIDE TESTIMONY IN SUPPORT OF PARTICULAR
7		SECTIONS OF THE ROUTE PERMIT APPLICATION?
8	Α.	Yes. I am testifying in support of portions of Chapter 2 including Section 2.4
9		(Project Schedule) and Section 2.5 (Project Costs) and those portions of
0		Chapter 3 (Section 3.1 Transmission Structure Engineering, Design, Section
1		3.4.2 Construction Procedures, 3.4.3 Transmission Line Construction, Section
12		3.4.4 Restoration Procedures, 3.5 Maintenance Procedures) relating to project
13		design, construction and maintenance.
14		
15		II. PROJECT OVERVIEW
16		
17	Q.	PLEASE PROVIDE A GENERAL DESCRIPTION OF THE PROJECT.
18	Α.	The Project consists of 345 kV transmission line facilities and substation
9		connections between the Hampton Substation and a new substation in the La
20		Crosse, Wisconsin area and a 161 kV transmission line between the proposed
21		North Rochester Substation and the existing Northern Hills Substation. The
22		Minnesota portion of the Project consists of the following:
23		A new 345 kV transmission line from the Hampton Substation
24		near Hampton, Minnesota (permitted as part of the Brookings
25		County—Hampton 345 kV Project) to a proposed North

1		Rochester Substation to be located between Zumbrota and Pine
2		Island, Minnesota;
3		• A new 345 kV transmission line from the proposed North
4		Rochester Substation to the proposed Mississippi River crossing
5		near Kellogg, Minnesota.
6		A new 161 kV transmission line between the proposed North
7		Rochester Substation and the existing Northern Hills Substation,
8		located in northwest Rochester, Minnesota; and
9		Construction of the proposed North Rochester Substation and
0		improvements to the Hampton and Northern Hills substations.
11		As currently proposed, the 345 kV sections of the Project in Minnesota will be
12		constructed as a single circuit on double-circuit capable poles.
13		
14		The Wisconsin portion of the Project will be permitted in a separate
15		proceeding before the Public Service Commission of Wisconsin.
16		
17	Q.	WHAT DOES IT MEAN FOR POLES TO BE "DOUBLE CIRCUIT CAPABLE"?
18	Α.	It means that the poles are designed to support two 345 kV circuits. For this
19		particular project, the davit arms for both circuits will be installed during initial
20		construction but only one circuit will be installed except as noted below.
21		
22	Q.	DOES THE CERTIFICATE OF NEED REQUIRE DOUBLE CIRCUIT CAPABILITY?
23	Α.	Yes. The Commission's Certificate of Need Order approved double circuit
24		capability for 345 kV portions of the Hampton – Rochester – La Crosse
25		Project to address future demand growth. Docket No. E-002/CN-06-1115,

1		Order Granting Certificates of Need With Conditions (May 22, 2009)
2		("Order"). The Commission noted that:
3 4 5 6 7 8		The obligation to build a single transmission line to meet short- and medium-term needs provides an opportunity to anticipate a longer-term need. In exchange for incurring the incremental cost of the Upsized Alternative in the short term - a cost estimated at \$200 million for all three [345 kV] projects - Applicants would receive for decades to
9 10 11 12 13		come the benefits of increased flexibility and avoided costs associated with building new transmission towers in certain areas. Given these advantages, MISO states that building single transmission lines on double-circuit towers has become standard practice.
14		Order at 29. The Commission therefore authorized the Applicants "to
15		implement their plans for making optimum use of the resulting capital
16		investments" by building double circuit capable poles. Id. at 30.
17		
18	Q.	WHAT ARE THE BENEFITS OF DOUBLE CIRCUIT CAPABILITY?
19	Α.	A double circuit line can occupy the same width of right-of-way as a single
20		circuit line. Therefore, constructing a double-circuit capable line has the
21		potential to reduce the overall number of transmission corridors.
22		
23	Q.	DESCRIBE THE ROUTES PROPOSED FOR THE NEW 345 KV LINE.
24	Α.	The Company proposed two routes in the Application for the new 345 kV line,
25		the Preferred Route and the Alternative Route. Both routes start at the
26		Hampton Substation near Hampton, Minnesota and end at a Mississippi River
27		crossing at Alma. In addition, the Company identified two route options to
28		provide flexibility at the Zumbro River Crossing ("Zumbro Dam Route

1		Option") and through the McCarthy Lake Wildlife Management Area
2		("WMA") ("McCarthy Lake Route Option"). During the Environmental
3		Impact Statement Scoping Process, another route option was proposed to
4		avoid impacts to the McCarthy Lake WMA that follows State Highway 42 to a
5		point south of Kellogg, Minnesota ("Highway 42 Route Option"). A map
6		showing these routes and route options is included as Schedule 2 to Tom
7		Hillstrom's Direct Testimony.
8		
9	Q.	DESCRIBE THE ROUTES PROPOSED IN THE APPLICATION FOR THE NEW 161
10		KV LINE.
11	Α.	The Company also proposed two routes for the new 161 kV line, the Preferred
12		Route and the Alternative Route. Both of the 161 kV routes start at the
13		proposed site of the new North Rochester Substation between Zumbrota and
14		Pine Island and end at the existing Northern Hills Substation in Rochester. A
15		map showing these two routes is included as Schedule 5 to Tom Hillstrom's
16		Direct Testimony.
17		
18	III.	TRANSMISSION STRUCTURE DESIGN AND CONSTRUCTION
19		
20	Q.	WHAT TYPE OF STRUCTURES DOES THE COMPANY PROPOSE TO USE FOR
21		THIS PROJECT?
22	Α.	For the Project's proposed 345 kV line, Xcel Energy proposes to primarily use
23		single pole, self-weathering steel double-circuit structures. For the North
24		Rochester – Northern Hills 161 kV line, Xcel Energy proposes to use single-
25		pole, self-weathering steel, single circuit structures. Single steel pole structures

are typically placed on large pier foundations of cast-in place, reinforced concrete. Specialty structures, including H-frame structures and other multiple pole, may be required in certain limited circumstances. For example, H-frame structures are sometimes required near environmentally sensitive areas when longer spans are required. H-frame structures consist of two steel poles with cross bracing. If soil conditions are poor, a deeper foundation, piling or other type of foundation may be required. Two-pole structures may also be required when the alignment turns at a 45- to 90-degree angle to reduce foundation size and aid constructability.

Q. ARE THERE ANY OTHER STRUCTURE TYPES THAT ARE PROPOSED FOR THIS PROJECT?

A. Yes. The crossing of the Mississippi River presents unique considerations that will require the use of triple circuit specialty structures. A portion of this crossing is on Upper Mississippi River Wildlife Refuge lands ("Refuge") managed by the U.S. Fish and Wildlife Service ("USFWS") and a Special Use Permit from the USFWS will be required to cross the Refuge. An existing 161/69 kV double-circuit transmission line crosses the Mississippi River and Refuge at the Project's proposed crossing location. The existing line crosses approximately 0.5 mile of Refuge lands and includes two structures on Refuge property. The proposed triple-circuit specialty structures will be constructed to carry two 345 kV circuits and a 161 kV circuit but will be operated at 345/161/69 kV. In Appendix E of the Application, the Company identified four possible design options for the proposed river crossing that which have

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1		location for a future 345 kV circuit and carry an existing 69 kV circuit
2		underbuild. These structures would range in height from 135 to 185 feet and
3		have spans of approximately 500 to 1,000 feet. The triple-circuit structures will
4		require an additional pole mid-span to support the 69 kV circuit.
5		
6	Q.	Are there any areas where two circuits will be strung on the
7		DOUBLE CIRCUIT CAPABLE STRUCTURES AT THE TIME OF CONSTRUCTION?
8	Α.	Yes. At crossings of US-52, Xcel Energy proposes to install conductors and
9		insulators on both sides of the poles during initial construction to facilitate the
10		addition of a second circuit in the future. Installation of both sets of
11		conductors will avoid future construction related conflicts and disruptions to
12		highway operations when the second circuit is warranted. Xcel Energy also
13		requests flexibility to install both sets of conductors at the crossings of the
14		Zumbro River in areas of difficult access.
15		
16		The Modified Preferred 345 kV Route and Alternate 345 kV Route follow the
17		Dairyland Power Cooperative's Q3 Rochester to Alma 161 kV line for 9 to 11
18		miles to the Mississippi River. For these routes, the Company proposes
19		installing 345 kV conductors and insulators on both circuits. The segment
20		would be energized at 345/161 kV to carry the new line and the existing Q3
21		line. No additional 345 kV circuit capacity would be created in any of these
22		configurations.
23		
24		If the Highway 42 segment is selected, the route would not follow the existing
25		Q3 and there would be no co-location.

1		
2	Q.	WOULD THE STRINGING OF THE SECOND SET OF CONDUCTORS AND
3		INSULATORS AS YOU PROPOSE AFFECT THE CAPACITY OF THE 345 KV LINE?
4	Α.	No. At crossings of US-52 the two sets of wires would be tied together and
5		would operate as a single circuit. At that Zumbro River crossing the second set
6		of conductors and insulators would be installed but not energized. For sections
7		collocated with Dairyland Power Cooperative's Q3 line, the second set of
8		conductors would be energized at 161 kV to carry the existing Q3 circuit.
9		
10	Q.	Are there any areas where the second set of conductors that
11		WOULD EXCEED 1,500 FEET?
12	Α.	Yes. At the Zumbro River crossing, the second set of conductors may be
13		installed to avoid later construction activities in areas of difficult or sensitive
14		construction access. At this location, the length of the second set of
15		conductors would likely be longer than 1,500 feet, however, the second set of
16		conductors would not be energized.
17		
18	Q.	If a portion of the 345 kV line were co-located with the $\mathbf{Q3}$, how
19		WOULD A SECOND 345 KV CIRCUIT LIKELY BE ACCOMMODATED?
20	Α.	At such time deployment of a second 345 kV circuit is warranted, the Q3 line
21		would need to be routed to a new 345/161 kV substation located in the
22		Plainview area to maintain community service reliability. In addition, a new
23		345/161 kV substation may be required near Alma to maintain outlet capability

would not be required to add a second 345 kV circuit if the Project were

of Dairyland Power Cooperative's generating plant. In contrast, these facilities

24

25

Cos	sts, 2009 Dollars	s (millions)	
Route	Initial	2 nd 345 kV	Total
Alternative	Construction	Circuit	
Hwy 42 Route	\$20.7	\$2	\$22.8
Q3 Route	\$18.7	\$16 to 31.3	\$34.7 to 50

3

4

Q. WHAT CONDUCTORS DOES THE COMPANY PROPOSE TO USE FOR THE

5 **PROJECT?**

A. Each phase of the 345 kV transmission line will consist of bundled conductors composed of two 954 kcmil 54/7 Cardinal Aluminum Conductor Steel

Supported ("ACSS") cables or conductors of comparable capacity. Each phase of the 161 kV transmission line will consist of a single conductor using 795

ACSS cables or conductors of comparable capacity. Typically, only one circuit (three pairs of bundled conductors) will be installed on three davit arms.

12

13 Q. What are the anticipated span lengths for the Project?

A. Spans would typically be 600 to 1,000 feet between structures for the majority of the 345 kV line Project. The 161 kV structures will be spaced approximately 400 to 700 feet apart.

17

18 Q. WILL FIBER OPTIC CABLES ALSO BE INSTALLED?

19 A. Yes. The shield wires on the 345 kV and 161 kV transmission line facilities will 20 include fiber optic cable that allows a path for substation protection equipment 21 to communicate with equipment at other terminals on the transmission line.

1		
2	Q.	DESCRIBE THE RIGHT-OF-WAY THAT WILL BE REQUIRED FOR THE
3		PROJECT.
4	Α.	Generally, a right-of-way cleared of obstructions is required for the safe
5		operation of the facilities. A 150-foot wide right-of-way will be needed for the
6		majority of the 345 kV transmission line. In some limited instances, where
7		specialty structures are required for long spans or in environmentally sensitive
8		areas, a larger, 180-foot wide, right-of-way may be required. A 80-foot wide
9		right-of-way will be required for the 161 kV transmission line.
0		
11	Q.	CAN YOU PROVIDE AN OVERVIEW OF THE CONSTRUCTION TECHNIQUES
12		THE COMPANY EXPECTS TO EMPLOY?
13	Α.	The general construction techniques for transmission line and substation
14		construction are contained in the Route Permit Application. Application at p.
15		3-13 to 3-20. To reduce the time of construction and minimize ground
16		disturbing impacts, Xcel Energy may use helicopters for conductor installation
17		and some hardware installation.
18		
9		In addition, Xcel Energy may use implosive connectors to join conductors and
20		deadend hardware rather than hydraulic splices. Implosive connectors use a
21		specific controlled detonation to fuse the conductors and hardware together.
22		The process creates noise equivalent to a clap of thunder or commercial

fireworks, which lasts only an instant. The implosive process provides for a

specific engineered connection, which improves the strength and quality of the

connections that can be a potential failure point in the transmission system. In

23

24

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1	addition, it takes less time than installing hydraulically-compressed connectors
2	and reduces the number of set up areas required on the ground. This further
3	reduces ground-disturbing activities.
4	
5	Both of these construction techniques are currently being used to construct the
6	CapX2020 Monticello to St. Cloud 345 kV Transmission Line Project.
7	The Company will coordinate with the Minnesota Department of
8	Transportation to develop a traffic management plan to minimize interference
9	with the operation of the highway.

IV. PROJECT SCHEDULE AND COST

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11

13 Q. What is the time schedule for completing the Project?

A. An overview of the expected permitting and construction schedule for the
Project was included in the Application in Section 2.4 and is provided below.
Additionally, Project completion by the second quarter of 2015:

HAMPTON –ROCHESTER –LA CROSSE 345 kV				
PROJECT SCHEDULE				
ACTIVITY	TIMEFRAME			
Minnesota Route Permit	Fall 2011			
Granted				
Wisconsin Certificate of Public	Spring 2012			
Convenience and Necessity				
Federal Environmental Impact	Spring 2012			
Statement				
Pre-Construction Activities	Spring 2012			
Construction Underway	Fourth Quarter 2012 to			
	Second Quarter 2015			

Project Completion	Second Quarter 2015
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Q. WHAT IS THE PROJECTED CAPITAL COST OF THE PROJECT?

The total cost of the Project, which includes the survey, engineering, materials, construction, right-of-way, and project management associated with the transmission line and substations, is dependent, in significant part, on the design of the transmission line facilities. The Project (Minnesota portion) will cost \$229 million to \$253 million (in 2009 dollars), depending on the route selected, as summarized in the tables below. I would note that the costs for the Hampton Substation are listed as zero as this substation is being permitted and constructed as part of the CapX2020 Brookings County – Hampton 345 kV Transmission Project (Docket No. E002/TL-08-1474).

345 kV Route Alternative	Cost (Millions)
Modified Preferred Route	\$194
Alternative Route	\$202
Modified Preferred Route with McCarthy Lake	\$199
Route Option	
Modified Preferred Route with Zumbro Dam	\$191
Route Option	
Modified Preferred Route with Highway 42 Route	\$196
Option	
Alternative Route with McCarthy Lake Route	\$207
Option	
Alternative Route with Highway 42 Route Option	\$202

Α.

161 kV Route Alternative	Cost (Millions)
Preferred Route	\$16
Alternative Route	\$17

1

Substation	Cost (Millions)
North Rochester Substation	\$22
Northern Hills Substation	\$2

2

3

CONCLUSION V.

4

- 5 DOES THIS CONCLUDE YOUR DIRECT TESTIMONY? Q.
- 6 Α. Yes.

7

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Grant David Stevenson, PMP

Xcel Energy 414 Nicollet Mall – MP8A Minneapolis, MN 55401 612-330-6330

grant.stevenson@xcelenergy.com

Experience

Project Manager, Senior Project Manager

2000 to present

Transmission Business Unit, Xcel Energy, Minneapolis, MN

- Provide strategic leadership to multidisciplinary teams on various high-profile transmission and substation projects.
- Work with planning, engineering, siting, construction, consultants and contractors to define scope
 of work, produce project estimates, gain capital spending authorization, establish project schedules,
 track and reconcile expenditures, gain permits, design, bid and construct capital projects to that
 meet budgets and in-service dates.
- Work extensively with the public and state regulatory officials during project permitting phases to
 locate new transmission lines in areas that balance issues of land use, cost, impact to people and
 impact to the natural environment. Participate and lead public meetings and provide testimony in
 permit proceedings.
- Recent project portfolio has included:
 - Since 2006, project manager for CapX 2020 Fargo and LaCrosse projects.
 - Project manager of Southwest Minnesota 825 MW wind transmission project, 2003 2006.
 This \$250 million project involved construction of 200 miles of new transmission lines, the reconstruction of 300 miles of existing lines, and impacted 29 substations. The project also required project agreements with 11 electric utilities.
 - SE Metro project, a rebuild of an existing 115 line to double circuit 115.
 - Bloomington relocation project, including 115 kV double circuit underground construction.

Sales and Customer Service Manager

1999 to 2000

Electric Sales and Customer Service, Northern States Power Company, Minneapolis, MN

- Successfully led team of 10 account representatives to meet goals in sales, customer service, demand side management and customer satisfaction.
- Managed projects to improve customer satisfaction and team effectiveness.
- Hired, trained and coached employees on energy management, conservation, distribution reliability.

Energy Management Engineer, Account Executive

1990 to 1999

Northern States Power Company, Minneapolis, MN

- Provided effective technical support to key industrial customers and NSP sales representatives regarding energy conservation programs and initiatives.
- Assumed role of Account Executive in 1995, managing NSP's relationship with several demanding strategic customers.
- Led multidisciplinary teams to solve customer-specific electric reliability, power quality, capacity, and distribution construction problems.

Plant Project Engineer

1986 to 1990

Sherburne County Generating Plant, Northern States Power Company, Becker, MN

- Managed contractors, directed work of plant operations, maintenance and technical personnel.
- Managed projects to improve productivity, efficiency and safety at NSP's largest generating plant.
- Identified electrical and mechanical problems and recommended corrective repairs.

Professional Certification

Certified Project Management Professional (PMP) by Project Management Institute, 2007

Education Project Management Institute Project Management Professional Training, 2007

Minnesota Management Institute, University of Minnesota School of Management, 2000 Intensive, condensed MBA-level business management curriculum.

Minnesota Management Academy, University of Minnesota School of Management, 1998 Management principles and skills for front-line managers.

Post-graduate coursework at University of St. Thomas and University of Minnesota in economics, business law, marketing, manufacturing.

Bachelor of Mechanical Engineering, University of Minnesota, 1986