Direct Testimony and Schedule
Jason T. Standing

**STATE OF NORTH DAKOTA**
**BEFORE THE**
**NORTH DAKOTA PUBLIC SERVICE COMMISSION**

In the Matter of the Application of Northern States Power Company for an Advance Determination of Prudence for the Lyon County to Sherburne County 345 kV Transmission Line

Case No. PU-23-____

Exhibit___(JTS-1)

# Transmission Planning

March 23, 2023

## Table of Contents



## Schedule

# I. INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND TITLE.

A. My name is Jason Standing. I am the Manager for Transmission Planning for Xcel Energy Services, Inc. (Xcel Energy), which supports the Xcel Energy operating companies, including Northern States Power Company-Minnesota (NSP or the Company). The Company provides electric service to customers in Minnesota, North Dakota, and South Dakota. The Company's affiliate, Northern States Power, a Wisconsin corporation (NSPW), provides electric service to customers in Wisconsin and Michigan. The Company and NSPW, together under the Interchange Agreement, own and operate the five-state integrated Upper Midwest Northern States Power Company system (NSP System).

Q. PLEASE DESCRIBE YOUR QUALIFICATIONS AND EXPERIENCE.

A. I have worked for Xcel Energy since 2004 in the area of Transmission. I have been in my current position since 2019. Prior to joining Xcel Energy, I was an engineer in various roles for different companies. In these various roles, I have done distribution planning, system protection, substation design, field engineering, and project management. My statement of qualifications is provided as Exhibit___(JTS-1), Schedule 1.

Q. WHAT ARE YOUR CURRENT RESPONSIBILITIES?

A. In my current role, I manage the Transmission Planning department for NSP and NSPW. My team is responsible for maintaining the system reliability through detailed analysis of the transmission system. We provide cost-effective solutions to a variety of issues that impact the transmission system.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY IN THIS PROCEEDING?

A. The purpose of my Direct Testimony is to provide general background on the Company's transmission cost estimates and to support the Company's proposal to construct and own the Lyon County to Sherburne County 345 kilovolt (kV) Transmission Line (the Project). The Project will be an approximately 160- to 180-mile double circuit transmission line connecting the existing Sherburne County Substation (Sherco Substation) in Becker, Minnesota, to a new substation in Lyon County, Minnesota, along with other associated facilities, including intermediate and voltage support substations. Specifically, I will discuss the Project cost and transmission interconnection cost assumptions that the Company relied upon in proposing the Project as part of its most recent Upper Midwest Integrated Resource Plan (IRP) proceeding, including how these estimated costs remain valid today. Finally, I briefly address why the Project is needed and will benefit customers, notwithstanding the Company's involvement in the Midcontinent Independent System Operator's (MISO) Long Range Transmission Planning (LRTP) portfolio.

Q. WHAT IS THE COMPANY REQUESTING IN THIS ADP?

A. Over the next seven years, NSP plans to retire all three units at the Sherco Generating Station (Sherco) located in Becker, Minnesota. While the Company is planning to replace some of this retiring capacity with on-site generation, the Company is proposing to construct the Project in order to bring new generation from other parts of Minnesota to the existing Sherco Substation point of interconnection (Sherco POI) to maximize the value of the Company's existing interconnection rights. Constructing the Project will allow the Company to bring new generation resources online to meet

identified capacity and energy needs, while avoiding delays and costs related to the MISO queue and congestion issues associated with the renewable-resource-rich area of southwestern Minnesota. As I describe further below, the Project is needed regardless of the interconnection capacity provided by MISO's LRTP project portfolio.

Q. HOW IS YOUR DIRECT TESTIMONY ORGANIZED?

A. My Direct Testimony is organized as follows:

- First, I provide some high-level background regarding the relationship between the Project and the Company's resource planning process;
- Second, I discuss the MISO LRTP process and how the Project differs from it;
- Third, I outline the assumed generic interconnection costs used in resource planning and explain why these estimates remain valid; and,
- Finally, I provide the estimated costs for the Project and discuss their relationship to generic per-line estimates developed in resource planning.

## II. TRANSMISSION COST ESTIMATES USED IN THE COMPANY'S IRP

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. In this section, I give a brief introduction to the relationship between the Project and the Company's IRP, discuss the differences between the Project and the LRTP, and then move on to the Company's estimates for generic interconnection costs assumed in the IRP and why those estimates, which are vital to calculating the value of the Project, remain valid. I also describe the

cost estimates for the Project and why these align with previous transmission cost estimates for other transmission projects.

### A. Background Regarding the IRP and the Project

Q. DOES YOUR TESTIMONY PROVIDE AN IN-DEPTH DISCUSSION OF THE COMPANY'S RESOURCE PLANNING PROCESS?

A. No, my discussion of the IRP is largely focused on providing some general background relevant to the need for the Project and the cost estimates that the Company develops for interconnecting with new generation resources. Those cost estimates provide a useful benchmark to use in evaluating the value of the Project. Company witness Ms. Farah Mandich provides more discussion of the Company's most recent resource planning cycle and a discussion of the economic value of the Project.

Q. WHAT ARE THE CRUCIAL COMPONENTS OF THE COMPANY'S RESOURCE PLAN RELEVANT TO THE NEED FOR THE PROJECT AND RELEVANT COST ESTIMATES USED IN EVALUATING THE PROJECT?

A. The "Alternate Plan" that was approved by the Minnesota Public Utilities Commission (MPUC) includes the following key items that are relevant to transmission planning and the need for the Project:

- Retiring all coal generation by 2030, and reducing operations at some units prior to retirement;
- Adding nearly 6,000 MW of new renewables to NSP's system by 2034; and
- Constructing and owning the Project, in order to retain valuable interconnection rights at the Sherco POI and provide a hedge against

MISO interconnection queue timing delays and high system upgrade costs associated with interconnecting new generation.

Q. WHY ARE INTERCONNECTION RIGHTS AT THE SHERCO POI PARTICULARLY VALUABLE?

A. MISO is experiencing significant ongoing transmission constraints and the MISO queue suffers from delays. Accordingly, the process of interconnecting necessary new generation resources can be difficult, costly, and time consuming. By using the existing rights at the Sherco POI, the Company can add new generation at less cost and in a more expedited manner.

Q. WHAT ARE THE COMPANY'S PLANS FOR RETIREMENT OF THE SHERCO UNITS?

A. NSP plans to retire all three units at Sherco by 2030. Specifically, Sherco Unit 2 will be retired in 2023, Sherco Unit 1 will be retired in 2026, and Sherco Unit 3 will be retired in 2030. Ms. Mandich provides more details regarding the Company's Sherco retirement plans.

Q. HOW WILL THE COMPANY REPLACE THE RETIRING GENERATION RESOURCES AT SHERCO?

A. As noted above, the Company's approved resource plan calls for adding 6,000 MW of new renewable generation, much of which will replace the retiring capacity at Sherco. As discussed further by Ms. Mandich, MISO's generator replacement rules require the Company to replace the retiring Sherco capacity within three years; otherwise NSP will lose the valuable interconnection rights at the Sherco POI associated with the Sherco Units. As I discussed above, these existing interconnection rights at Sherco are highly valuable. As a result, after evaluating several different scenarios for replacing the retiring Sherco

resources, the Company's Alternate Plan proposed to construct and own the Project, to serve the twin goals of (1) bringing substantial amounts of generation onto the system to meet our identified capacity needs and carbon reduction goals, and (2) reutilizing our existing interconnection rights at the Sherco POI while simultaneously avoiding costly and unpredictable MISO queue and congestion issues. The Project allows the Company to "control our own fate" and reutilize our valuable existing interconnection rights, rather than rely solely on the MISO queue and the potentially significant system upgrade costs associated with interconnecting needed capacity in the future.

Q. DID THE COMPANY EVALUATE THE PROJECT'S LOCATION AS PART OF RESOURCE PLANNING?

A. Yes. While typical resource planning does not account for resource location, NSP's power flow and dynamic system modeling do consider a generator's location. These planning models also examine grid reliability and stability impacts of specific resource additions or subtractions at very granular timescales. The Company conducted significant modeling to assess the viability and cost-effectiveness of the Sherco gen-tie concept, with different configurations and amounts of generation it could reliably deliver. Initial reliability screens showed the line could be added while maintaining system stability, assuming the requisite equipment is added and identified line capacity and POI limits are followed.

Q. HAS THE COMPANY ADDRESSED SOME OF THE MISO QUEUE ISSUES IN OTHER WAYS?

A. Yes. In March 2020, Xcel Energy joined with nine other transmission-owning Load Serving Entities in the Upper Midwest to produce the CapX2050

Transmission Vision Report. (CapX2050 Report). The goal of the CapX2050 Report was to educate and inform Upper Midwest policymakers and other stakeholders about the future of the grid in future decades. One of the critical findings from the CapX2050 Report was the need for more transmission system infrastructure to accommodate the transition to more non-dispatchable resources.

NSP included this CapX2050 study in its latest IRP dockets and analysis, underscoring the comprehensive nature of the Company's transmission and resource planning procedures.

Q. HOW DOES THE PROJECT RELATE TO THE TRANSMISSION EXPANSIONS CONTEMPLATED IN THE CAPX2050 REPORT?

A. As its purpose is to directly connect with Company-owned generation resources and use valuable existing interconnection rights, the Project differs from other transmission projects and is not the type of transmission expansion contemplated in the CapX2050 Report. The Project is a separate initiative.

## B. The Project and MISO's Long Range Transmission Planning

Q. PLEASE PROVIDE A HIGH-LEVEL OVERVIEW OF MISO'S LRTP PROCESS.

A. MISO has identified LRTP as a key initiative to support reliability within the MISO territory. The focus of the LRTP is to improve the ability to move electricity across the MISO region from where power is generated to load centers, reliably and at the lowest possible cost. Through MISO's Planning Advisory Committee (PAC)—which the Company participates in—MISO

plans to approve four tranches of transmission solutions developed to provide reliable and economic energy delivery to address future reliability needs.

Q. HAS MISO ALREADY APPROVED A TRANCHE OF PROJECTS UNDER THE LRTP?

A. Yes. The 2022 MVP Portfolio, also referred to as the LRTP Tranche 1 Portfolio, was the first tranche of transmission solutions developed as part of MISO's LRTP effort to provide reliable and economic energy delivery to address future reliability needs resulting from transformational changes in the resource fleet. The MISO Board of Directors unanimously approved the $10.3 billion LRTP Tranche 1 Portfolio on July 25, 2022. This portfolio includes 18 transmission projects in MISO's Midwest Subregion. For these projects, MISO found a benefit-to-cost ratio of at least 2.6, where benefits well exceeded costs.

The Portfolio represents the most complex transmission study effort in MISO's history. Specifically, the Portfolio consists of more than 2,000 miles of additional transmission lines that will allow up to 53 gigawatts of new generation capacity to connect to the transmission grid. None of the Portfolio projects will connect with southwestern Minnesota.

Q. IS THE PROJECT PART OF THE LRTP PORTFOLIO?

A. No. The Project is separate from the LRTP process and portfolio. It has a more specific purpose of connecting specific generation resources in southwestern Minnesota with the Company's Sherco Substation POI.

Q. WILL THE LRTP PORTFOLIO PROJECTS ALLEVIATE THE NEED FOR THE PROJECT?

A. No. Although the LRTP projects are designed to provide substantial interconnection capacity, alleviating existing congestion and enabling additional generation interconnections, they do not address the needs identified by the Company for this Project. Without the Project, it would be difficult for the Company to utilize the prime wind resources in southwestern Minnesota and its Sherco interconnection rights.

Q. WOULD IT MAKE SENSE FOR THE COMPANY TO USE LRTP PORTFOLIO PROJECTS TO CONNECT WITH ADDITIONAL GENERATION RESOURCES RATHER THAN USING THE PROJECT TO CONNECT WITH RESOURCES IN SOUTHWESTERN MINNESOTA?

A. No. The MISO interconnection queue process can take considerably more time than the process for interconnecting into the Project line and injecting power into the system at the existing Sherco POI. As the units at Sherco retire, the Company is planning to maintain its current interconnection capacity at Sherco by continuing to inject power at this POI via local generation and the Project. If the Company were forced to utilize LRTP networked lines to accomplish this task, it would run the risk of interconnection delays that could jeopardize its ability to meet identified capacity and energy needs. Further, the interconnection process under MISO can entail relatively high costs, making these projects less cost-efficient.

Q. WOULD THE PROPOSED PROJECT LINE HAVE THE SAME INTERCONNECTION PROCESS AS THE LRTP LINES?

A. No. The LRTP projects will be networked lines, meaning any generator will be able to seek interconnection using MISO's generator interconnection queue. The only way NSP can retain its interconnection rights at Sherco is to directly connect Company-owned generation to the Sherco substation via a single generation tie line, like the Project.

Q. SO DO YOU BELIEVE THAT THE PROJECT IS NEEDED IN ADDITION TO MISO'S LRTP PROJECTS?

A. Yes. Even with the substantial investments in the MISO transmission grid contemplated by the LRTP, NSP is making its own transmission expansion to account for the loss of generation resources at the Sherco POI. While the LRTP projects do provide some additional transmission resources to the Company's load centers, they do not eliminate need for the Company to develop additional generation to meet the need identified in the IRP. Therefore, a combination of Company-funded projects and MISO-wide projects will help provide system reliability as existing units retire. The Project will provide efficient and reliable transmission service and allow the Company to retain and use its interconnection rights at Sherco while simultaneously meeting Company-wide emission goals.

### C. Transmission Interconnection Costs

Q. HOW DID NSP EVALUATE TRANSMISSION INTERCONNECTION COSTS IN THE IRP?

A. In the IRP, the Company evaluated different baseload scenarios considering the potential transmission costs associated with each scenario's modeled

generation buildout. In other words, when evaluating generation resources, NSP also included any potential transmission expansion projects necessary to interconnect the particular generation resources. This metric is defined as the comparative cost required to build transmission to accommodate generation expansion in a given scenario. These cost assumptions are used by Ms. Mandich in her evaluation of the costs of alternatives to the Project.

Q. WHAT INTERCONNECTION COST ASSUMPTIONS DID THE COMPANY INCORPORATE INTO THE MODELING?

A. For each scenario, the Company modeled transmission interconnection costs at $500/kW for wind additions and $200/kW for solar additions. These dollar-per-kilowatt transmission cost assumptions are estimates based on a number of different studies, historical Resource Plan assumptions, and recent MISO queue study results.

Q. PLEASE PROVIDE ADDITIONAL DETAIL ON HOW NSP DERIVED THESE INTERCONNECTION COST ASSUMPTIONS IN THE IRP.

A. For wind, the Company started by reviewing estimates contained in the 2015 IRP. The Company then also employed a random siting analysis to help inform the transmission delivery cost estimates as well. However, NSP assessed that the resulting costs did not represent the full costs of wind interconnections because they only represented addressing localized system overloads and did not capture more significant transmission upgrades that would be identified and required as part of the larger MISO study process. Thus, NSP found the process useful but did not place much weight on the results. Finally and most importantly, the Company considered the recent system impact studies identified in recent MISO Definitive Planning Phase

(DPP) cost estimates, which identified interconnection costs of approximately $969/kW. Taking that information into account, the Company determined that an estimate of $500/kW for wind transmission interconnections was appropriate.

The Company used a similar analytical process for solar as it did for its wind transmission interconnection cost estimates. Ultimately, NSP considered recent system impact study estimates from MISO's DPP cost estimates. Based on that analysis, the Company estimated a $200/kW cost for solar interconnections.

Q. SINCE THIS INITIAL RESEARCH IN THE IRP, HAS THE COMPANY CONDUCTED FURTHER INTERCONNECTION COST ANALYSIS?

A. Yes. Based on most recent MISO Interconnection Queues, Transmission Access confirmed that the 2019 IRP numbers are still valid.

### D. Project Cost Assumptions and Updated Estimates

Q. DURING THE IRP, DID NSP DEVELOP ANY COST ESTIMATES FOR FUTURE GEN-TIE TRANSMISSION LINE PROJECTS?

A. Yes. As part of the planning process, the Company developed per-mile transmission line cost estimates that NSP could use to develop costs for future projects. The Company arrived at a $3.5 million per mile figure for double-circuited transmission lines, excluding right of way costs.

Q. HOW DID THE COMPANY DEVELOP ITS COST ESTIMATE FOR THE PROJECT?

A. Since the final route has not been determined, the Company developed a Project cost based on estimated route length, plus substation costs. This

analysis was based on NSP's recent experience constructing another 345-kV line in Minnesota—the Company updated the actual costs from this prior project based on current market conditions and included a contingency factor. In additional to the actual costs of this prior project, NSP considered the following components in developing its cost estimates:

- Transmission line structures and materials;
- Transmission line construction and restoration;
- Transmission line permitting and design;
- Transmission line and substation right-of-way acquisition; and
- Substation materials, permitting, design, and construction.

Q. BASED ON THIS ANALYSIS, WHAT IS THE ESTIMATED COST OF THE PROJECT?

A. NSP estimates that construction of the Project, including substation construction, will cost $817 million (NPV in $2023) assuming a 180-mile line. These costs include all transmission line costs (including materials, associated construction, permitting and design costs, and risk assessment contingencies), two new substations and a series compensation substation, Sherco Substation modification costs (including materials, construction, permitting and design costs, and risk contingencies), AFUDC, and right-of-way/land acquisition costs. On a nominal basis, this value equates to approximately $1.14 billion. Table 1 below provides a breakdown of the Project costs on a nominal basis.

**Table 1**

**Project Cost Estimates**

| Project Components | $millions |
|---|---|
| Transmission Line (Gen-tie) | $689 |
| Sherburne County Substation (Sherco) Modifications | $9 |
| Terminal Substation (Lyon County)<br>Series Compensation Equipment | $164 |
| Intermediate Substation | $24 |
| Series Compensation Substation | $253 |
| **Project Total** | $1.139 |

Q. HOW DO THESE COSTS COMPARE TO THE GENERIC TRANSMISSION LINE COSTS THE COMPANY DEVELOPED IN THE LAST IRP?

A. The transmission cost divided by 180 miles results in a total cost per mile of approximately $3.8 million, including right of way costs. These estimated costs are generally consistent with the per-mile transmission line cost estimates the Company provided during the IRP proceeding and have been updated to account for inflation and cost pressures occurring more generally, as well as changed assumptions regarding Project components. More specifically, for example, the Project as proposed now would include synchronous condensers at the Terminal Substation; those facilities were not included in the IRP cost estimate because, at that time, the attributes provided by the synchronous condensers were planned to be fulfilled via combustion turbine (CT) capacity with a clutch feature. Separately, too, the cost estimate now incorporates changes since 2021 as a result of inflation, supply chain issues, rising material costs, and a challenging labor market.

Q. CONSIDERING THESE CHANGES, DO YOU BELIEVE THE COST ESTIMATES ARE REASONABLE?

A. Yes. The cost estimates represent a reasonable basis upon which to make planning and prudence decisions. It is important to note, however, that the Project cost estimates are based on long straight alignments. If the final route for the line includes many corner structures and/or an alignment that jumps across features, costs will increase.

## III. CONCLUSION

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes, it does.

**BEFORE THE PUBLIC SERVICE COMMISSION**
**OF THE STATE OF NORTH DAKOTA**

NORTHERN STATES POWER COMPANY
ADVANCE PRUDENCE - LYON COUNTY TO
SHERBURNE COUNTY 345 KV TRANSMISSION LINE
APPLICATION

CASE NO. PU-23-____

VERIFICATION

STATE OF MINNESOTA )
) SS.
COUNTY OF HENNEPIN )

Jason T. Standing, being first duly sworn on oath, deposes and says that he is Manager of Transmission Planning for Applicant Northern States Power Company, a Minnesota corporation, in the above-captioned matter, that the testimony submitted in the above-captioned matter under his name was prepared under his direction, that he knows the contents thereof, and that the same is true and correct to the best of his knowledge and belief.

Jason T. Standing

Subscribed and sworn to before me on this 14th day of March, 2023

JODI LYNN YANZ
NOTARY PUBLIC
MINNESOTA
My Commission Expires 01/31/2027

Notary Public
My Commission expires: 1/31/2027

# Jason T. Standing

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## SUMMARY

Degreed Electrical Engineer experienced in management in government, commercial, and utility markets. Capable of satisfying customer needs and expectations through creative engineering problem solving techniques and accurate communications.

## PROFESSIONAL EXPERIENCE

Xcel Energy, Minneapolis, MN 2019-current
**Manager Transmission Planning, NSP/NSPW**

- Lead a team of transmission experts to develop long-term plans to ensure reliable transmission operations
- Coordination of diverse groups of contributors to develop regional and local plans
- Serve as expert witness in state permitting and regulatory process
- Develop future planning tools and processes to help with the grid of the future

Xcel Energy, Minneapolis, MN 2015-19
**Principal Transmission Planning Engineer**

- Lead Transmission Planning engineer for the Twin Cities area
- Responsible for training new Transmission Planning engineers
- Involved in local and regional policy with states and RTOs
- Develop computer programming skills and incorporate into Transmission Planning

Xcel Energy, Minneapolis, MN 2014-15
**PROMOD Planning Engineer**

- Provide Production Cost Modeling for the NSP area
- Evaluate transmission project impacts to generation
- Congestion analysis

Xcel Energy, Minneapolis, MN 2004-14
**Senior Specialty Transmission Planning Engineer**

- Responsible for leading and improving the Constructability I process for which all new transmission projects must be approved through
- Lead Technical expert for the Hiawatha Certificate of Need
- Lead the MISO MTEP process for NSP and NSPW areas
- Involved with neighboring and regional entities to create cost effective solutions to the regional and bulk transmission issues
- Work closely with MISO to ensure Xcel Energy's interests are being heard through multiple working groups

Wunderlich-Malec Systems, Minnetonka, MN 2002-2003
**Project Manager**

- Managed the design, electrical system analysis, and procurement for substation projects
- Responsible for delivering cost analysis to the customer, preparing equipment bids, while monitoring expenses
- Provided field support for the construction team to ensure that the substation was delivered on time and to the customer's satisfaction

**Design Engineer**

- Lead design engineer for the American Transmission Company's new 69 kV substation
- Lead engineer responsible for accurate settings of the system protection relays
- Responsible for ensuring the NEC codes were followed
- Created new drawing sets while updating old drawing sets to ensure accuracy for the customer

Sebesta Blomberg and Associates, Roseville, MN 2000-2002
**Project Engineer**

- Commissioning specialist whose duties included creating test sheets for various types of electrical equipment, field visits, overseeing testing specialists at the Pentagon and other commercial sites
- Design engineer who used creative problem-solving techniques to redesign customer's 230 kV and 115 kV breaker control panels.
- Developed load flow and system protection studies

Alliant Energy, Madison, WI 1999-2000
**Distribution Systems Planner**

- Responsible for running load flow analysis for the southern Wisconsin electrical distribution and transmission systems
- Involved in maintaining and updating existing computer models to reflect changes to the physical system
- Prepared cost analysis reports for management

## EDUCATION

B.S. in Electrical Engineering, North Dakota State University, Fargo, ND 1999
MBA, University of Minnesota, Minneapolis, MN 2011
Profession Engineer Minnesota, PE 2012

## COMPUTER EXPERIENCE

PSSE, PROMOD, Synergi, SKM Power Tools, Microsoft Office