

Direct Testimony and Schedule
Farah L. Mandich

Before the Minnesota Public Utilities Commission
State of Minnesota

In the Matter of the Application of Northern States Power Company d/b/a Xcel Energy
for a Certificate of Need for Additional Dry Cask Storage at the
Monticello Nuclear Generating Plant Independent Spent Fuel Storage Installation
in Wright County

Docket No. E002/CN-21-668
Exhibit___(FLM-1)

Resource Planning

March 1, 2023

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Schedule

Statement of Qualifications

Schedule 1

1 **I. INTRODUCTION AND QUALIFICATIONS**

2
3 Q. PLEASE STATE YOUR NAME AND TITLE.

4 A. My name is Farah L. Mandich. I am Director of Resource Planning and
5 Bidding for Xcel Energy Services, Inc. (XES or Service Company), which
6 supports the Xcel Energy operating companies, including Northern States
7 Power Company d/b/a Xcel Energy (Xcel Energy or the Company). The
8 Company provides electric service to customers in Minnesota, North Dakota,
9 and South Dakota.

10
11 Q. PLEASE DESCRIBE YOUR QUALIFICATIONS AND EXPERIENCE.

12 A. I have worked for XES since April 2019 in the areas of Regulatory Affairs and
13 Resource Planning. I have been in my current position since September 2021.
14 In my first role with the Company, in the Regulatory Affairs department, I
15 worked with cross-functional teams to develop Integrated Resource Plan
16 (IRP) and resource acquisition filings for the Company.

17
18 Prior to joining XES, I worked as a Policy Advisor for Southern California
19 Edison, a large investor-owned utility in California. In this role, I supported
20 development of Integrated Resource Planning and resource acquisition
21 regulatory filings before the California Public Utilities Commission. My
22 statement of qualifications is provided as Exhibit____(FLM-1), Schedule 1.

23
24 Q. WHAT ARE YOUR CURRENT RESPONSIBILITIES?

25 A. In my current role, I lead the Resource Planning team on the development of
26 resource plans and acquisitions for the five-state integrated Upper Midwest
27 Northern States Power Company system (NSP System), which provides

1 electric service to customers in North Dakota, South Dakota, Minnesota,
2 Wisconsin, and Michigan. This includes assisting the Company in making
3 reasonable and prudent acquisition decisions for electric generation resources.
4

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

6 A. The purpose of my Direct Testimony in this proceeding is to support the
7 Company's application for a Certificate of Need (CON) to expand the existing
8 Integrated Spent Fuel Storage Installation (ISFSI) at the Monticello Nuclear
9 Generating Plant (Monticello Plant or the Plant). The Plant is currently slated
10 to operate until 2030, and the proposed expansion of the Plant's ISFSI will
11 enable the Plant to operate for an additional 10 years, until 2040. If the ISFSI
12 is not expanded, the Monticello Plant would need to close in 2030, and the
13 Company would need to replace the substantial capacity and energy it provides
14 to the NSP System with other resources.
15

16 Q. WERE YOU INVOLVED IN DEVELOPING THE COMPANY'S CON APPLICATION,
17 AND ARE YOU SPONSORING ANY PORTIONS OF THE CON APPLICATION?

18 A. Yes. I was involved in developing the Company's CON Application
19 (Application) and am sponsoring the following sections of the Application:

- 20 • Ch. 3.3 (Resource Plan)
- 21 • Ch. 4.1 (Adequacy, Reliability, Safety and Efficiency of Energy Supply)
22 (excepting sections 4.1.2- 4.1.3)
- 23 • Ch. 4.2.2 (Generation Alternatives)
- 24 • Ch. 4.2.4 (No Action)
- 25 • Ch. 5.1 (Socially Beneficial Uses of the Output of the Facility)
- 26 • Ch. 9.3 (Generation Alternatives (Also "No Action" Alternative)).

1 Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

2 A. My testimony is organized as follows:

- 3 • *Section II*: I discuss the role of nuclear generation generally, and the
4 Monticello Plant particularly, in Xcel Energy's electrical generation.
- 5 • *Section III*: I address resource planning in the context of the Company's
6 most recent IRP Docket in Minnesota.
- 7 • *Section IV*: I discuss the Generation Alternatives to the Monticello Plant
8 should the Plant's life not be extended.
- 9 • *Section V*: Conclusion

10

11 **II. THE ROLE OF NUCLEAR POWER AND THE**
12 **MONTICELLO PLANT IN THE COMPANY'S**
13 **ELECTRICAL GENERATION PORTFOLIO**

14

15 Q. PLEASE EXPLAIN THE IMPORTANCE OF NUCLEAR GENERATION TO THE
16 COMPANY'S GENERATION PORTFOLIO.

17 A. The Company's nuclear generation plants, including the Monticello Plant,
18 provide critical baseload generation and fuel diversity benefits that are
19 important for maintaining overall reliability on the NSP System. Additionally,
20 the Monticello Plant provides carbon-free baseload generation, and in that
21 respect, its continued operation is critical to achieving the Company's (and
22 Minnesota's) carbon-reduction goals while reducing exposure to more volatile
23 fuel and wholesale electricity prices.

24

25 Q. CAN YOU HIGHLIGHT SOME OF THE FACTORS THAT MAKE THE MONTICELLO
26 PLANT AN IMPORTANT BASELOAD RESOURCE ON THE NSP SYSTEM?

27 A. Yes. As a baseload resource, the Plant operates 24 hours a day, seven days a

1 week for extended periods of time. The Monticello Plant provides 671
2 megawatts of baseload capacity and has generated over 200 million MWh
3 since it started operating. As a synchronous generator, the Monticello Plant
4 also provides a wide range of essential reliability services to the grid. Nuclear
5 generation is inherently more resistant to reliability events such as severe
6 weather and fuel disruptions due to on-site fuel storage. The Plant is critical
7 to Xcel Energy's ability to meet the ongoing, steady or base demand for
8 electrical power. The removal of the Monticello Plant from the electrical
9 supply system would create a several hundred MW capacity deficit and a
10 several million MWh deficit in the region in 2031, if not replaced with other
11 generation resources.

12
13 Q. PLEASE ADDRESS THE MONTICELLO PLANT'S IMPORTANCE AS A CARBON-
14 FREE GENERATION RESOURCE.

15 A. Since it has commenced operations, the Monticello Plant's generation
16 translates into over 212 million tons of CO₂ emissions avoided. The Plant is
17 a cornerstone of Xcel Energy's vision to achieve an 80 percent reduction in
18 carbon emissions compared to 2005 levels by 2030 and our Company goal of
19 providing 100 percent carbon-free electricity to our customers, the state and
20 the region by 2050.

21
22 Governor Tim Walz recently signed 2023 Minn. L. Ch. 7, mandating, among
23 other things, that each electric utility in the state of Minnesota generate or
24 procure 100 percent carbon-free electricity for its Minnesota retail customers
25 by 2040. Nuclear generation will be an important component of the
26 Company's compliance with this statutory requirement, as well as the interim
27 carbon-free generation goals established by this new law, cost effectively. The

1 impact of this new law on the Company's Application is discussed in greater
2 detail in the testimony of Company witness Mr. Allen Krug.

3
4 **III. THE COMPANY'S UPPER MIDWEST**
5 **INTEGRATED RESOURCE PLAN**
6

7 Q. HAS THE EXTENSION OF THE LIFE OF THE MONTICELLO PLANT BEEN
8 CONSIDERED BY THE COMMISSION IN ANY OTHER DOCKET?

9 A. Yes. The Minnesota Public Utilities Commission (Commission) considered
10 the extension of the Plant's life as part of the Company's 2020-2034 Upper
11 Midwest IRP cycle.

12
13 Q. DID THE COMPANY SUBMIT RESOURCE PLANS IN THE IRP DOCKET THAT
14 INCLUDED EXTENSION OF THE MONTICELLO PLANT?

15 A. Yes. The IRP was initially filed in 2019 in Docket No. E002/RP-19-368,
16 proposing a preferred plan that recommended extension of the Monticello
17 Plant. The Company filed two additional plans during the course of the IRP
18 Docket, including the Company's Alternate Plan, filed in June of 2021. Each
19 of the Company's proposed plans recommended extending the operation of
20 the Monticello Plant until 2040.

21
22 Each of the submitted plans, including the Alternate Plan, included an
23 extensive discussion of the Company's forecasts of energy and capacity needs
24 over the IRP time period, including factors that could lead to variance in those
25 forecasts.

1 Q. HOW DID THE COMPANY GO ABOUT ANALYZING POTENTIAL ALTERNATIVES
2 TO THE PROPOSED MONTICELLO PLANT EXTENSION IN THE IRP?

3 A. In the course of the IRP, the Company analyzed options for replacing the
4 capacity and energy provided by the Monticello Plant.

5

6 Q. ARE THOSE IRP ANALYSES USEFUL IN CONSIDERING ALTERNATIVES TO THE
7 ISFSI EXPANSION PROPOSED IN THIS CON PROCEEDING?

8 A. Yes. As I noted above, if the Commission does not grant the CON allowing
9 the Company to expand the ISFSI at the Monticello Plant, the Plant would
10 need to shut down in 2030, and the Company would need to replace the
11 substantial capacity and energy it provides to the system. The analysis
12 performed in the IRP Docket addressed these alternatives.

13

14 Q. PLEASE SUMMARIZE THE RESULTS OF THIS ANALYSIS.

15 A. The Company's IRP analysis found that, in general, extending the life of the
16 Monticello Plant as part of our IRP Alternate Plan is cost effective from both
17 a present value of revenue requirements (PVRR) and present value of societal
18 cost (PVSC) perspective, supports achievement of our carbon reduction goals,
19 and ensures that we maintain a robust share of firm and/or dispatchable
20 generation relative to peak load across seasons. The analysis of replacement
21 scenarios favored extension of the Monticello Plant due to the important
22 reliability, resource diversity, and carbon-reduction benefits that the Plant
23 provides to the NSP System. I discuss this analysis in greater detail in Section
24 IV of my testimony.

1 Q. HAS THE COMMISSION RENDERED A DECISION ON THE IRP?

2 A. Yes. On April 15, 2022, the Commission issued its order in the IRP docket
3 approving the Company's Alternate Plan with some modifications. This order
4 provides, among other things, that the Company is authorized to pursue the
5 extension of the operating life of the Plant by 10 years.¹

6

7 Q. WHAT STANDARDS GOVERN THE COMMISSION'S CONSIDERATION OF AN IRP?

8 A. Under Minn. R. 7843.0500, subp. 3, resource options and resource plans must
9 be evaluated on their ability to:

- 10 A. maintain or improve the adequacy and reliability of utility service;
- 11 B. keep the customers' bills and the utility's rates as low as practicable,
12 given regulatory and other constraints;
- 13 C. minimize adverse socioeconomic effects and adverse effects upon the
14 environment;
- 15 D. enhance the utility's ability to respond to changes in the financial,
16 social, and technological factors affecting its operations; and
- 17 E. limit the risk of adverse effects on the utility and its customers from
18 financial, social, and technological factors that the utility cannot
19 control.

20

21 Q. ARE THESE STANDARDS ALIGNED WITH THE CRITERIA THE COMMISSION
22 CONSIDERS IN A CON PROCEEDING SUCH AS THIS?

23 A. The two standards are not completely aligned, but both standards take into
24 consideration the adequacy and reliability of energy supply, cost, and
25 socioeconomic and environmental effects. Thus, while the Commission's

¹ *In the Matter of the 2020-2034 Upper Midwest Integrated Resource Plan of Northern States Power Company d/b/a Xcel Energy*, MPUC Docket No. E002/RP-19-368. ORDER APPROVING PLAN WITH MODIFICATIONS AND ESTABLISHING REQUIREMENTS FOR FUTURE FILINGS at 32 (April 15, 2022).

1 decision in the IRP does not, in and of itself, approve the expansion of the
2 ISFSI or the extension of the Monticello Plant's operating life, it does indicate
3 that the extension of the Plant's life is an essential piece of our plan that was
4 found to satisfy the IRP criteria.

6 **IV. GENERATION ALTERNATIVES**

7
8 Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

9 A. In this section, I discuss the Company's analysis of two primary alternative
10 Replacement Cases. These analyses are discussed in Chapter 9 of the CON
11 Application.

12
13 Q. HOW DID THE COMPANY CONDUCT THIS ANALYSIS?

14 A. For purposes of analyzing the Monticello Plant extension individually, the
15 Company compared the IRP Alternate Plan, in which Monticello is extended
16 to 2040, to two replacement cases. The first replacement case (Replacement
17 Case 1) retires Monticello at its currently scheduled date and allows the
18 resource planning model to freely optimize replacements needed to fill the
19 energy and capacity needs created by the retirement. In other words, we
20 allowed the model to select the most cost-effective alternative resources to
21 replace Monticello, and we did not require the model to choose any specific
22 resource type to replace the Plant. If left to optimize the most cost-effective
23 resources to replace Monticello, the model will choose to add (or pull forward
24 from later years) approximately 750 MW of gas-fired combustion turbines
25 (CTs) in 2030, primarily to meet capacity needs, alongside approximately 750
26 MW of additional wind resources and 200 MW of solar resources throughout
27 the planning period, relative to the Alternate Plan.

1 In the second replacement case, the model was restricted from selecting any
2 incremental CTs to those that were included in the IRP Alternate Plan.
3 (Replacement Case 2). In essence, this prevented the model from replacing
4 the Monticello Plant's capacity with gas-fired units. In this scenario, the model
5 selects resources to meet customer needs left open by Monticello's retirement
6 entirely with solar, energy storage, and wind. Specifically, it pulls forward
7 and/or adds an incremental 300 MW of battery energy storage resources, 600
8 MW of incremental solar, and 950 MW of incremental wind.

9
10 Q. WHAT FACTORS MUST THE COMMISSION CONSIDER WITH RESPECT TO
11 GENERATION ALTERNATIVES?

12 A. Generally, generation alternatives are to be evaluated on four factors: size,
13 type and timing of the proposed facility compared to the alternatives; cost of
14 the proposed facility and cost of energy compared to the cost of alternatives
15 and the cost of energy that would be supplied; natural and socioeconomic
16 impacts compared to the alternatives; and the reliability of the proposal
17 compared to alternatives.

18
19 Q. WHAT WERE THE RESULTS OF THE COMPANY'S ANALYSIS OF POTENTIAL
20 REPLACEMENT CASES?

21 A. This analysis found that extending the operational life of the Monticello Plant
22 best balances the Company's objectives regarding cost, carbon reduction,
23 reliability and market risk outcomes, relative to both Monticello replacement
24 cases.

1 These findings are summarized in the table below. The most favorable
 2 outcomes for each cost, environmental and risk/reliability metric are
 3 highlighted in green below.

4
 5 **Table 4-1: Key Metrics for the Company’s Alternate Plan Relative to**
 6 **Alternatives in which Monticello is Retired in 2030**

Category	Measure	Alternate Plan <i>(as presented in IRP)</i>	Monticello Replacement 1 <i>(fully optimized replacement)</i>	Monticello Replacement 2 <i>(replace with only renewables and storage)</i>
Resource Assumptions and Selection	Baseload retirements assumed before 2034	<ul style="list-style-type: none"> • King (2028) • Sherco 3 (2030) • Prairie Island (2033-2034) 	<ul style="list-style-type: none"> • King (2028) • Sherco 3 (2030) • Monticello (2030) • Prairie Island (2033-2034) 	<ul style="list-style-type: none"> • King (2028) • Sherco 3 (2030) • Monticello (2030) • Prairie Island (2033-2034)
	Resources optimized	All available	All available	<ul style="list-style-type: none"> • Wind, solar, battery energy storage • Must replace all energy and capacity from Monticello by 2031
	Incremental resources (MW) selected to replace Monticello capacity and energy relative to the Alternate Plan, through 2034	n/a	<ul style="list-style-type: none"> • CT: 750 • Wind: 750 • Solar: 200 <p><i>Plus fewer market sales and additional market purchases</i></p>	<ul style="list-style-type: none"> • Storage: 300 • Solar: 700 • Wind: 950 <p><i>Plus additional market purchases</i></p>

Category	Measure	Alternate Plan <i>(as presented in IRP)</i>	Monticello Replacement 1 <i>(fully optimized replacement)</i>	Monticello Replacement 2 <i>(replace with only renewables and storage)</i>
Cost²	2020-2045 PVSC (\$ million), delta from Alternate Plan	n/a	63	89
	2020-2045 PVRR (\$ million), delta from Alternate Plan	n/a	(38)	88
Environmental Performance	Carbon reduction from 2005 levels, 2031 (percent)	86	83	86
	Total carbon serving customers, 2031 (million tons)	3.815	4.721	3.840
	Total carbon-free generation, 2031 (percent)	82	78	82
Risk and Reliability	Firm capacity-to-annual (summer) peak demand ratio, 2034	0.58	0.58	0.51
	Firm capacity-to-winter peak demand ratio, 2034	0.75	0.75	0.66

² Deltas may not tie out to total PVSC and PVRR values noted here, due to rounding.

1 Q. PLEASE SUMMARIZE WHAT THE MODELING SHOWED REGARDING THE COSTS
2 ASSOCIATED WITH CONTINUING TO OPERATE THE MONTICELLO PLANT
3 COMPARED TO THE REPLACEMENT CASES.

4 A. From a cost perspective, Replacement Case 1 results in higher costs on a
5 PVSC basis, of approximately \$63 million over the full analysis period (2020-
6 2045). There are several contributing factors to these cost differences between
7 the cases. First, while Replacement Case 1 results in reduced cost associated
8 with running the Monticello facility for an additional 10 years, these reductions
9 are largely offset by the incremental combustion turbine (CT), wind, and solar
10 resources selected in the plan. Further, Replacement Case 1 results in higher
11 market purchase costs and less revenue from market sales. Finally, there are
12 higher levels of generation from emitting resources and market purchases,
13 which all increase emissions associated with the plan and thereby the cost of
14 carbon.

15

16 On a PVRR basis, because externality and regulatory costs of carbon are not
17 included and there are differences in resource dispatch, this plan results in
18 incremental savings relative to the Alternate Plan, of approximately \$38
19 million. Minnesota planning standards, however, require consideration of
20 externality costs and regulatory cost of carbon for emitting resources.³
21 Considering only the PVRR costs of each scenario would risk customer
22 exposure to future federal or state policy changes that prioritize or require
23 increasingly clean energy supply. For example, when this resource plan was
24 developed, the state of Minnesota had not yet adopted 2023 Minn. L. Ch. 7,
25 the legislation requiring the Company to generate or procure 100 percent

³ Minn. Stat. § 216B.2422 subd.3.

1 carbon-free electricity for its Minnesota retail customers by 2040, but we are
2 better positioned to comply with these new requirements as a result of
3 including reasonable regulatory costs of carbon in our past analyses.

4
5 From a cost perspective, Replacement Case 2, which precluded use of carbon-
6 emitting resources as replacement, results in higher costs on both a PVSC and
7 PVRR basis by approximately \$90 million over the full analysis period (2020-
8 2045). There are several contributing factors to these cost differences between
9 the cases. Again here, while Replacement Case 2 results in reduced cost
10 associated with running the Monticello facility for an additional 10 years, these
11 reductions are offset by the storage, wind, and solar resources pulled forward
12 into earlier years. Further, while there is relatively little difference in annual
13 market sales between Replacement Case 2 and the Alternate Plan, this case
14 relies more heavily on market purchases. Also underlying this cost result are
15 increased integration costs⁴ associated with higher levels of wind and solar
16 added here, in earlier years, relative to the Alternate Plan.

17
18 Q. DOES THE RECENTLY ENACTED INFLATION REDUCTION ACT AFFECT THE
19 COST OF THE MONTICELLO PLANT EXTENSION?

20 A. Yes. The Inflation Reduction Act (IRA) includes tax benefits that, for at least
21 the first few years of the extension, will reduce costs below those previously
22 anticipated to continue to operate the Monticello Plant past 2030. For nuclear
23 generation, the IRA affords Production Tax Credits (PTC) for energy
24 generated; however, unlike for renewable generation, the value is not fixed.
25 Rather, it provides different levels of incentive related to MISO market prices

⁴ Integration costs account for the cost of market uncertainty around renewable energy production forecasts; essentially that the market needs to carry additional resources in order to make up for probabilistic uncertainty in that forecasting.

1 at the gen-node where the unit injects energy. I should note that the U.S.
2 Department of Treasury continues to develop and refine tax guidance at the
3 time of this filing; however, in general, we expect these new PTCs to further
4 improve the economics of the Monticello extension.

5
6 Q. PLEASE SUMMARIZE THE DIFFERENCES IN ENVIRONMENTAL PERFORMANCE
7 ASSOCIATED WITH CONTINUING TO OPERATE THE MONTICELLO PLANT
8 COMPARED TO THE REPLACEMENT CASES.

9 A. Removing the Monticello unit from our portfolio and allowing the model to
10 optimize its replacement with gas and wind resources leads to increased
11 carbon emissions associated with serving customers. Replacement Case 1
12 achieves lower levels of carbon reduction from a 2005 baseline after 2030, and
13 notably regresses from its 2030 low when Monticello retires. This regression
14 occurs because, although a number of renewable resources are added to
15 partially replace the energy from Monticello, the system also relies more
16 heavily on gas generation and market purchases to serve customer needs when
17 renewables are not available. As noted in the summary table above,
18 Replacement Case 1 includes nearly one million tons of additional carbon
19 emitted in service of customer needs in 2031, the first year after Monticello
20 would cease operations.

21
22 On a carbon emissions basis, Replacement Case 2 performs better than
23 Replacement Case 1, which allowed incremental CTs, and performed similarly
24 to the Alternate Plan; this is because we required the model to choose
25 resources to replace the energy and capacity from Monticello with zero
26 emissions renewable resources and battery energy storage. However, there

1 are still differences in the emissions reduction achievement between cases, due
2 largely to increased market purchases in Replacement Case 2.

3
4 Q. HOW DID THE REPLACEMENT CASES COMPARE TO THE ALTERNATE PLAN WITH
5 RESPECT TO RISK?

6 A. Monticello is a significant baseload resource on the NSP System. For over 50
7 years, the 671 MW Monticello Plant has played a critical role in the fleet of the
8 Company's generating resources, generating over 200 million MWh of energy,
9 which translates to over 210 million tons of avoided carbon emissions. The
10 Plant operates at full capacity 24 hours a day, 7 days a week for extended
11 periods of time and is used to meet the ongoing, steady or base demand for
12 electrical power. The plant has achieved an average capacity factor of 95
13 percent over the past three years (including a record-setting 99.3 percent in
14 2018 and over 98 percent in 2020 and 2022). In the spring of 2021, the Plant
15 completed a record run of 704 days of continuous operation. No other
16 resource in our fleet, with the exception of Prairie Island, provides this type
17 of consistent, reliable, carbon-free energy and capacity. Combined with
18 Prairie Island, the Plant represents nearly 27 percent of the total electric energy
19 (and 45 percent of the carbon-free energy) our customers consumed in 2021.
20 Neither of the Replacement Cases replaces the capacity and energy generated
21 by the Monticello Plant with the same sort of baseload resource.

22
23 With respect to Replacement Case 1, the clean baseload energy that would
24 have been produced by the Monticello Plant is only partially backfilled with a
25 mix of renewables and gas generation. Replacement Case 1 requires additional
26 gas dispatch from existing resources (such as gas combined cycle facilities) and
27 new and existing CTs. Replacement Case 1 also includes substantially less

1 generation overall than the Alternate Plan, indicating that the resultant
2 resource portfolio includes reduced sales and increased market purchases
3 rather than fully replacing the generation from Monticello. This creates an
4 exposure point for customers; if we have to lean more heavily on the market
5 to meet customer energy needs, customers are more exposed to electricity
6 market price volatility, whereas nuclear energy provides steady, low cost and
7 carbon-free energy on a 24/7 basis (planned outages notwithstanding).

8
9 Replacement Case 2 does not maintain the same level of firm and dispatchable
10 capacity on our system as the Alternate Plan or Replacement Case 1. This
11 ratio is an indication of how much market risk a particular portfolio may result
12 in during periods of low renewable and/or duration limited resource
13 availability. Whereas the Alternate Plan and Replacement Case 1 maintained
14 a nearly 60 percent ratio relative to summer peak demand and a 75 percent
15 ratio relative to forecasted winter peak demand, Replacement Case 2 relies
16 more heavily on variable renewables and duration limited energy storage. This
17 plan results in a firm-to-peak load ratio of closer to 50 percent in the summer
18 and 70 percent for winter load. This ratio, while not an official reliability
19 metric, provides an indication of potential market risk, especially in light of
20 observed periods of low renewable output over multi-day events. Winter
21 Storm Uri in February, 2021 or the 2019 polar vortex are clear examples of
22 such events, but as discussed in our IRP, these periods of low renewable
23 output do not always occur concurrent with extreme weather. During this
24 period of time, our nuclear units were valuable and stable sources of clean
25 baseload generation, whereas wind resources were lower than average across
26 much of the Company's Upper Midwest footprint.

V. CONCLUSION

1

2

3 Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

4 A. Yes, it does.

Farah L. Mandich

Statement of Qualifications

Farah Ladan Mandich is Director of Resource Planning and Bidding for Northern States Power Company – Minnesota. She currently leads the Company’s Resource Planning team in the development of resource plans and resource acquisitions for the NSP System, which provides electric service to customers in North Dakota, South Dakota, Minnesota, Wisconsin, and Michigan. She has been in this role since September 2021; previously she did a one-year development rotation in the Resource Planning team as a specialist and acting team lead. Mandich initially joined Xcel Energy in April 2019 as a Regulatory Policy Specialist, where she was responsible for developing resource planning and resource acquisition regulatory filings for NSPM.

Prior to joining Xcel Energy, Mandich was a Policy Advisor at Southern California Edison (SCE), a large investor-owned utility in California. In this role, she supported development of Integrated Resource Planning and resource acquisition regulatory filings before the California Public Utilities Commission. Before working on California regulatory issues, Mandich was a Knowledge Specialist in global consultancy McKinsey & Company’s Electric Power & Natural Gas practice, where she served as a subject matter expert to both U.S. and international clients on North American utility and renewable energy markets.

Mandich received her Bachelor of Science in Economics from Texas Christian University and her Master of Public Policy from the University of Michigan’s Gerald R. Ford School of Public Policy.