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Rebuttal Testimony and Schedules  
Philip Joseph "P.J." Martin

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 151.2 MW Dakota Range III Wind Facility

Case No. PU-18-430

**Resource Planning**

Exhibit\_\_\_(PJM-2)

June 12, 2019

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**I. INTRODUCTION**

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- Q. PLEASE STATE YOUR NAME AND TITLE.
- A. My name is Philip Joseph “P.J.” Martin. I am the Director, Resource Planning, for Northern States Power Company – Minnesota (NSP or Xcel Energy or the Company).
- Q. ARE YOU THE SAME P.J. MARTIN WHO SUBMITTED PRE-FILED DIRECT TESTIMONY IN THIS PROCEEDING?
- A. Yes.
- Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?
- A. The purpose of my Rebuttal Testimony is to respond to the Direct Testimony of Commission Advocacy Staff Witness James A. Heidell with regard to the economic impacts of the proposed power purchase agreement (PPA) between the Company and Dakota Range III, LLP for a new wind generation facility (Dakota Range III). My testimony provides additional modeling conducted in response to Mr. Heidell’s testimony and also explains how our modeling process works for this and similar transactions.
- Q. HOW IS YOUR TESTIMONY ORGANIZED?
- A. My Testimony is organized as follows:
- Section II discusses the Supplemental Analysis conducted by the Company on Dakota Range III and the Google load;
  - Section III provides a system cost analysis of the Google load;



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1 is one of many different load scenarios that could occur under the Google  
2 ESA, but for the purposes of the Supplemental Analysis, all Parties agreed it  
3 was a reasonable representation of potential load growth for the data center.  
4 Additionally, following discussions with Advocacy Staff, we updated the  
5 outlet capacity amounts in the Strategist model from 1,350 to 1,800 MW in  
6 all cases.

7  
8 Q. WHAT DOES STRATEGIST MODEL?

9 A. Strategist is a production cost model. This means it analyzes the costs to the  
10 NSP System of the generation portfolio and ancillary costs, such as certain  
11 transmission components as well as fixed and variable operations and  
12 maintenance costs. While it produces its results in a revenue requirements  
13 outlook, the revenue requirements are only for the production component  
14 of the Company's system-wide cost of service. Said differently, Strategist  
15 does not capture all of the Company's cost of service, only those costs  
16 related to generation.

17  
18 Q. WHY IS THIS IMPORTANT?

19 A. The Strategist tool only measures system costs of production to meet certain  
20 forecasts based on the model assumptions. While it optimizes a "least cost"  
21 expansion plan, it does not account for other costs of service such as  
22 transmission and certain administrative and general expenses, nor the impact  
23 of load growth – and associated sales that come from that load growth – on  
24 allocation of these costs. This is important because the interplay of Dakota  
25 Range III and the Google load on the Company's North Dakota cost of

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1 service goes beyond the ability of Strategist to measure; additional analysis to  
2 the outputs from Strategist are necessary to obtain a complete picture.

3  
4 Q. WHAT DID THE SUPPLEMENTAL ANALYSIS INDICATE WITH RESPECT TO NSP  
5 SYSTEM COSTS TO SUPPORT THE GOOGLE LOAD?

6 A. The first step of the Supplemental Analysis involved adding the Google load  
7 to our load forecast and Dakota Range III as a resource addition and then  
8 determining the difference in impact that the Google load made. The  
9 Supplemental Analysis found that the addition of Dakota Range III and the  
10 assumed Google data center load results in reduced market sales in the 2021-  
11 2030 period by an average of *[TRADE SECRET BEGINS*  
12 *TRADE SECRET ENDS]* annually, and reduced dump energy by  
13 *[TRADE SECRET BEGINS* *TRADE SECRET ENDS]*  
14 annually during the same timeframe, as well as the acceleration of the  
15 addition of a combustion turbine from 2030 to 2028. This results in an  
16 overall system cost increase of *[TRADE SECRET BEGINS*  
17 *TRADE SECRET ENDS]* PVRR system-wide.

18  
19 Q. WAS THERE AN ADDITIONAL STEP TO THE SUPPLEMENTAL ANALYSIS?

20 A. Yes. As I noted earlier, Strategist outputs do not reflect the increased load,  
21 retail sales, and demand allocator impacts that occur with the addition of  
22 adding significant new load to the system. Consequently, the Company  
23 analyzed the impact in changes to the demand allocator that occur from the  
24 Google load and applied that analysis to the Strategist outputs.

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1 Q. DID THIS RESULT IN SAVINGS FOR NORTH DAKOTA CUSTOMERS?

2 A. Yes. While overall system production costs increase as a result of the  
3 addition of the Google load, the Supplemental Analysis found that  
4 production costs allocated to North Dakota decrease by *[TRADE*  
5 *SECRET BEGINS* *TRADE SECRET ENDS]* PVRR and  
6 up to *[TRADE SECRET BEGINS* *TRADE SECRET ENDS]*  
7 million in a single year due to the shifting of production costs from North  
8 Dakota to Minnesota under the demand allocator due to the Google load.

9

10 Q. DOES THE SUPPLEMENTAL ANALYSIS PROVIDE A COMPLETE VIEW OF THE  
11 IMPACTS OF THE GOOGLE LOAD TO NORTH DAKOTA CUSTOMERS?

12 A. No. The Supplemental Analysis accounted for the demand allocator impacts  
13 of the addition of the Google data center load in Minnesota and factored  
14 this into the calculation. However, the Supplemental Analysis did not  
15 account for the shifting of other system costs or the energy allocator impacts  
16 of adding the Google load to Minnesota.

17

18 Q. DOES THIS MEAN THERE ARE ADDITIONAL SAVINGS TO NORTH DAKOTA  
19 CUSTOMERS THAT ARE NOT REFLECTED IN THE SUPPLEMENTAL ANALYSIS?

20 A. Yes. Company Witness Benjamin C. Halama calculates these savings in his  
21 Rebuttal Testimony. His results indicate a net savings to North Dakota  
22 customers of up to *[TRADE SECRET BEGINS* *TRADE*  
23 *SECRET ENDS]* PVRR when both Dakota Range III and *[TRADE*  
24 *SECRET BEGINS* *TRADE SECRET ENDS]* of Google load  
25 are added to the NSP System. These savings are generated by the shifting in

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1 costs from North Dakota to Minnesota, as described in detail by Mr.  
2 Halama.

3  
4 Q. IN LIGHT OF MR. HALAMA'S ADDITIONAL ANALYSIS, IN YOUR VIEW ARE THE  
5 COST SAVINGS TO NORTH DAKOTA CUSTOMERS REASONABLE?

6 A. Yes, I believe that the cost savings to North Dakota customers are  
7 reasonable. It should not be a surprise that load growth naturally increases  
8 overall system costs as additional resources are required to serve the energy  
9 and capacity needs of the additional load. However, there are two reasons in  
10 this case that the incremental load is good for North Dakota customers.  
11 First, higher retail sales will increase system costs but reduce customer rates,  
12 as demonstrated by Mr. Halama's analysis (bigger denominator in the rate  
13 calculation). Second, we are procuring an extremely economic resource to  
14 help serve the new load and further reduce overall system costs. Therefore,  
15 the combination of the load growth and the low-cost wind resource create a  
16 win-win for all of our customers.

17  
18 **III. SYSTEM COST ANALYSIS OF GOOGLE LOAD**

19  
20 Q. DID YOU CONDUCT ADDITIONAL ANALYSIS OF THE SYSTEM COST IMPACTS OF  
21 ADDING THE GOOGLE DATA CENTER LOAD TO THE NSP SYSTEM?

22 A. Yes. In response to Mr. Heidell's testimony, I conducted additional  
23 Strategist runs isolating the production cost to the entire NSP System of  
24 adding the Google data center load. Although the addition of the Google  
25 load itself is not before the Commission, it is reasonable to consider in  
26 analyzing the Dakota Range III ADP because the Google ESA is tied to

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1 Dakota Range III. This analysis demonstrates that large load additions to  
2 the system generate cost savings system-wide. The results of my additional  
3 analysis for the 2021-2030 period are included below in part as Table 1 and  
4 in full in Exhibit\_\_\_(PJM-2), Schedule 2.

5  
6 **Table 1**  
7 **Results of Analysis for 2021-2030**

8 Scenario	PVRR (\$M)	Cost/Savings (\$M)	Notes
9 <i>[TRADE SECRET BEGINS</i>			
10			
11			
12			

12 *TRADE SECRET ENDS]*

13  
14 Q. WHAT ARE THE IMPACTS OF ADDING DAKOTA RANGE III TO THE SYSTEM  
15 WITHOUT THE GOOGLE LOAD?

16 A. Table 1 shows that if the Google load is not added to the system, the  
17 addition of Dakota Range III reduces overall system costs by about  
18 *[TRADE SECRET BEGINS* *TRADE SECRET ENDS]*  
19 PVRR (DAK minus Base in Table 1). This is consistent with what one  
20 would expect when adding a low-cost resource to the NSP System.

21  
22 Q. WHAT ARE THE SAVINGS GENERATED BY DAKOTA RANGE III IF THE  
23 GOOGLE LOAD IS ALSO ADDED TO THE SYSTEM?

24 A. Table 1 demonstrates that if the Google load is added to the system, the  
25 addition of Dakota Range III generates savings of *[TRADE SECRET*  
26 *BEGINS* *TRADE SECRET ENDS]* PVRR (DAK W Load

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1 minus Base W Load). Thus the addition of the Google load increases the  
2 system savings from the Dakota Range III project by over *[TRADE*  
3 *SECRET BEGINS* *TRADE SECRET ENDS]* PVRR when  
4 compared with the addition of Dakota Range III alone.  
5

6 Q. WHAT DOES THIS ANALYSIS DEMONSTRATE OVERALL ABOUT THE PRUDENCE  
7 OF DAKOTA RANGE III?

8 A. This analysis demonstrates that the Dakota Range III PPA will generate cost  
9 savings across the NSP System regardless of whether the Google load comes  
10 onto the system. It further demonstrates that the Google load amplifies the  
11 savings of the Dakota Range III PPA, producing an additional *[TRADE*  
12 *SECRET BEGINS* *TRADE SECRET ENDS]* PVRR  
13 savings across the system. Thus, Dakota Range III is prudent as a  
14 standalone resource and is prudent when considered in combination with  
15 the Google load.  
16

17 **IV. IMPACTS OF REJECTING THE ADP APPLICATION**  
18

19 Q. HOW DOES MR. HEIDELL PROPOSE TO TREAT THE COSTS AND BENEFITS OF  
20 THE GOOGLE DATA CENTER LOAD IF THE ADP APPLICATION IS REJECTED?

21 A. If the Commission rejects the Company's request for an ADP for the  
22 Dakota Range III PPA, Mr. Heidell proposes addressing the costs of the  
23 PPA in the Fuel Cost Rider (FCR) by removing the PPA from the  
24 Company's fuel and purchased power, and removing the load of the data  
25 center from system sales in the calculation of average system fuel and power  
26 costs. Thus the PPA and the Google data center load would be removed

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1 from the numerator and denominator, respectively, of the Company's  
2 calculation of the system average cost of fuel.

3  
4 Q. IS MR. HEIDELL'S PROPOSAL FEASIBLE?

5 A. Ultimately, no. I believe it is not possible to fully isolate the costs of the  
6 Google load, including associated transmission costs, in order to prevent  
7 them from being applied to North Dakota customers. There are too many  
8 variables that can trigger certain costs as well as savings to be able to fully  
9 isolate the impacts of the Google load short of system separation, as  
10 discussed by Company Witness Bria E. Shea in her Rebuttal Testimony. As  
11 noted above, the addition of the Google load in Minnesota shifts the  
12 demand and energy allocations from North Dakota to Minnesota. Thus in  
13 order to fully account for the impacts of the Google load, we would have to  
14 adjust these allocation factors based on the expected impacts of serving the  
15 Google load. As noted elsewhere in the Company's testimony, the Google  
16 load *[TRADE SECRET BEGINS* *TRADE SECRET*  
17 *ENDS]* and it would be virtually impossible to directly correlate certain  
18 system costs to the Google load alone.

19  
20 **V. CONCLUSION**

21  
22 Q. PLEASE SUMMARIZE YOUR CONCLUSIONS.

23 A. The Supplemental Analysis of Dakota Range III and the Google load  
24 demonstrated cost savings to North Dakota customers, and due to the  
25 limitations of the Strategist tool these costs are likely an underestimate.  
26 Additionally, the Dakota Range III PPA decreases system costs by *[TRADE*

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1        *SECRET BEGINS*                                *TRADE SECRET ENDS]* PVRR as a  
2        standalone resource, but these savings increase to [*TRADE SECRET*  
3        *BEGINS*                                *TRADE SECRET ENDS]* PVRR if the Google  
4        load is also added to the NSP System. Under all scenarios modeled and  
5        sensitivity tests conducted and in the record of this Case, the Dakota Range  
6        III PPA and Google load provide cost savings to North Dakota customers.

7

8    Q.    DOES THIS CONCLUDE YOUR PRE-FILED REBUTTAL TESTIMONY?

9    A.    Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF NORTH DAKOTA

NORTHERN STATES POWER COMPANY  
ADVANCE PRUDENCE  
151.2 MW DAKOTA RANGE III WIND FACILITY

CASE NO. PU-18-430

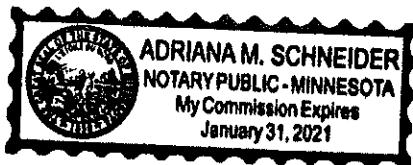
VERIFICATION

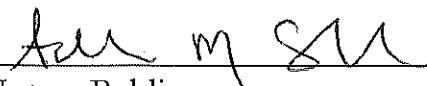
STATE OF MINNESOTA            )  
  )SS.  
COUNTY OF HENNEPIN

Philip Joseph Martin, being first duly sworn on oath, deposes and says that he is the Director of Resource Planning and Bidding 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.

  
\_\_\_\_\_  
Philip Joseph Martin

Subscribed and sworn to before me on this 10 day of June, 2019



  
\_\_\_\_\_  
Notary Public  
My Commission expires: 1-31-21

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- Not Public Document – Not For Public Disclosure  
 Public Document – Not Public Data Has Been Excised  
 Public Document

Xcel Energy Information Request No. 2-8  
Docket No.: PU-18-430  
Response To: ND Public Service Commission  
Requestor: Victor Schock  
Date Received: April 17, 2019

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Question:

Referring to confidential Attachment A to NSP's response to NDPSC-1-011;

- a) If the Google load was added to Strategist for the scenario with Dakota Range III would the market sales and dump energy be lower?
- b) If the market sales are lower as a result of adding both Dakota Range III and the Google load to the NSP system, will that lower the savings estimate for adding Dakota Range III?
- c) Please rerun the Dakota Range III scenario with Markets On and adding the Google load and provide an update to Attachment A and an update of the forecast savings. **(Note, if there are issues with this request or you want to discuss assumptions please contact Advocacy Staff as we are not trying to create unnecessary work.)**
- d) If Strategist is rerun with the addition of the Google load how does the addition of combustion turbines change from the Resource Reference case?

Response:

The modelling inputs provided in this response were developed in collaboration with Advocacy Staff and have been agreed to by the Parties as reasonably representative of a potential load growth scenario for the Google Data center. Additionally, per discussions with Advocacy Staff, the Company has updated the outlet capacity amounts in the model from 1,350 to 1,800 MW of outlet in all cases and sensitivities (including the Reference Case).

Last, while Strategist provides a reasonable view of overall system costs, its outputs do not reflect the increased load, retail sales, and demand allocator impacts that occur with the addition of material new load to the system. Said differently, Strategist's outputs reflect only the added costs to the system of serving additional load and not the benefits of that new load. Consequently, the Company has applied a demand

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allocator analysis to the Strategist outputs to help ensure that both the costs and the benefits of the addition of the Google load are appropriately captured. This analysis indicates that the addition of the Google load lowers overall costs to our North Dakota customers in all years and on a PVRR basis.

- a) Please see Attachment A provided in live Excel spreadsheet format with the trade secret version of this response. The addition of the assumed Google load results in reduced market sales and dump energy. During the 2021-2030 timeframe, market sales are reduced by an average of *[TRADE SECRET BEGINS TRADE SECRET ENDS]* annually while dump energy is reduced by an average of *[TRADE SECRET BEGINS TRADE SECRET ENDS]* annually.
- b) Please see the tab named “ND Impact to 2030” in Attachment A to this response and/or the table below. The addition of the assumed Google load increases overall costs relative to the other cases primarily because the addition of the assumed load accelerates the addition of a combustion turbine from 2030 to 2028. At the same time, however, the addition of the assumed load in Minnesota will impact the allocation of costs to North Dakota. Consistent with the methodology used to calculate the impact in Table 3 of Company Witness Mr. Philip Martin’s Direct Testimony, the table below shows the change in the jurisdictional allocator due to the added assumed load in Minnesota through 2030.

(\$M)	PVR R	Nom-inal	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	<i>[TRADE SECRET BEGINS</i>														
Base-Mnkato Owned															
DAK															
DAK w Load															
2019 ND Dem Alloc															
ND Alloc Costs															
ND Dem Alloc w/ Google															
ND Alloc Costs w/ Google															
Allocator difference															
<b>ND Cost Impact</b>															

*TRADE SECRET ENDS]*

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As shown above, while overall system resource costs increase, costs allocated to North Dakota [*TRADE SECRET BEGINS* *TRADE SECRET ENDS*] on a PVRR basis.

- c) Please see Attachment A provided with the Trade Secret version of this response.
- d) The addition of the assumed Google load results in the acceleration of a single combustion turbine (CT) from 2030 to 2028 to help accommodate the additional load requirements. In the original runs, the model added 1 CT in 2027 and 3 CTs in 2030. With the load addition, the model adds 1 CT in 2027, 1 CT in 2028 and 2 CTs in 2030.

Portions of this response and Attachment A in its entirety are marked as Trade Secret and include information of the same type as the information identified in the Company's First Supplement to its Application for Trade Secret Protection (filed May 2, 2019) in this Case and should therefore be afforded Trade Secret Protection consistent with the request in the First Supplement.

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Preparer: P.J. Martin  
Title: Director, Resource Planning  
Department: Resource Planning  
Telephone: 612.321.3065  
Date: May 16, 2019

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Northern States Power Company

Case No. PU-18-430  
NDPSC Data Request No. 2-8  
Attachment A

Attachment A provided in live Excel spreadsheet format with the Trade Secret version of this response includes inputs used in running modelling for the Dakota Range III scenario with Markets On.

Attachment A is marked as Trade Secret in its entirety and includes information of the same type as the information identified in the Company's First Supplement to its Application for Trade Secret Protection (filed May 2, 2019) in this Case and should therefore be afforded Trade Secret Protection consistent with the request in the First Supplement.

***[TRADE SECRET BEGINS***

***TRADE SECRET ENDS]***

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Northern States Power Company

Case No. PU-18-430  
Exhibit\_\_\_\_(PJM-2), Schedule 2  
4 Pages Total

Schedule 2 provided with the Not-Public version of the Rebuttal Testimony of Company Witness Philip J. Martin provides an analysis isolating the production cost to the entire NSP System of adding the Google data center load.

Schedule 2 is marked as Not-Public in its entirety. The information therein is consistent with the type of information approved for protection in the Commission's ORDER GRANTING TRADE SECRET PROTECTION, issued March 19, 2019, and its ORDER GRANTING SUPPLEMENTAL TRADE SECRET PROTECTION, issued May 21, 2019 in the above-noted case.

***[TRADE SECRET BEGINS***

***TRADE SECRET ENDS]***