SIERRA CLUB

June 8, 2020

Will Seuffert
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

VIA E-FILING

Re: In the Matter of an Investigation into Self-Commitment and Self-Scheduling of Large Baseload Generation Facilities
Docket No. E999/CI-19-704
Sierra Club Public Version of Initial Comments: Minnesota Power 2020 Annual Compliance Filing

Dear Mr. Seuffert:

Sierra Club respectfully submits its Initial Comments on Minnesota Power's 2020 Annual Compliance Filing in Docket No. E999/CI-19-704.

These comments and attachments contain information Minnesota Power considers to be Trade Secret. Sierra Club believes this filing comports with the Minnesota Public Utilities Commission's Notice relating to Revised Procedures for Handling Trade Secret and Privileged Data, pursuant to Minn. Rule 7829.0500.

Please contact me at (303) 454-3358 or laurie.williams@sierraclub.org if you have any questions regarding this filing.

Sincerely,

/s/Laurie Williams
Staff Attorney
Sierra Club
1536 Wynkoop St. Suite #200
Denver, CO 80202

Enclosures

STATE OF MINNESOTA
BEFORE THE PUBLIC UTILITIES COMMISSION

Katie J. Sieben	Chair
Valerie Means	Commissioner
Matthew Schuerger	Commissioner
Joseph K. Sullivan	Commissioner
John A. Tuma	Commissioner

In the Matter of an Investigation into Self-Commitment and Self-Scheduling of Large Baseload Generation Facilities	))))	Docket No. E-999/CI-19-704

SIERRA CLUB INITIAL COMMENTS
IN RESPONSE TO MINNESOTA POWER'S 2020 COMPLIANCE FILING

Developed with the Assistance of Synapse Energy Economics, Inc., Jamie Hall (lead)
485 Massachusetts Ave., Suite 3
Cambridge, Massachusetts, 02139

PUBLIC DOCUMENT – TRADE SECRET [or PRIVILEGED] DATA HAS BEEN EXCISED

June 8, 2020

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I. INTRODUCTION AND PURPOSE OF COMMENTS

Sierra Club, with the assistance of Synapse Energy Economics, Inc. (Synapse), submits these comments in response to Minnesota Power's (MP's) March 2, 2020 Annual Compliance Filing in *In the Matter of an Investigation into Self-Commitment and Self-Scheduling of Large Baseload Generation Facilities,* Docket No. E999/CI-19-704. Synapse, a research and consulting firm specializing in energy, economic, and environmental topics, has been retained by Sierra Club to provide expert services and analysis in this docket.

Sierra Club engaged Synapse in this docket to evaluate MP's commitment and dispatch decision-making practices for its Boswell 3 and 4 units and to evaluate the effects of those practices on the units' economic performance. The purpose of these comments is to provide recommendations to the Minnesota Public Utilities Commission ("the Commission") on actions the Commission should take to address uneconomic commitment and dispatch practices and related activities, and to encourage MP to operate Boswell 3 and 4 in a manner that maximizes value to ratepayers.

Recent public analyses have highlighted that utilities' heavy reliance on the practice of self-commitment and self-scheduling coal plants is harming customers.[1] When a utility fails to conduct forward-looking analyses to inform unit commitment and dispatch decisions, resulting in periods of avoidable uneconomic operation, the Commission must address the question of the prudence of the variable costs, including fuel costs, incurred during those times. Under Minnesota law, the utility bears the burden of proving these costs are reasonable and in the public interest. Minn. Stat. § 216B.16, Subd. 4.

As discussed in detail below, Minnesota Power has entirely failed to conduct the analysis required by the Commission in its *Order Accepting 2017-2018 Electric Reports and Setting Additional Requirements, In the Matter of the Review of the 2017-2018 Annual Automatic Adjustment Report for All Electric Utilities*, Docket No. E-999/AA-18-373, Nov. 13, 2019. In that Order, the Commission instructed:

> Minnesota Power, Otter Tail, and Xcel shall submit an annual compliance filing analyzing the potential options for seasonal dispatch generally, and potential options and strategies for utilizing "economic" commitments for specific coal-fired generating plants. The utilities shall include a specific explanation of barriers or limitations to each of these potential options, including but not limited to technical limits of the units and contract

[1] *See, e.g.*, Sierra Club's 2019 report *Playing With Other People's Money: How Non-Economic Coal Operations Distort Energy Markets*, available at: https://www.sierraclub.org/sites/www.sierraclub.org/files/Other%20Peoples%20Money%20Non-Economic%20Dispatch%20Paper%20Oct%202019.pdf.

> requirements (shared ownership, steam offtake contracts, minimum fuel supply requirements, (shared ownership, steam offtake contracts, minimum fuel supply requirements, etc.) as relevant, on March 1, 2020, and each year thereafter.

Id., Order Point 8. Minnesota Power did not analyze potential options for seasonal dispatch, nor did it analyze potential "options and strategies for utilizing 'economic' commitments" at its coal plants. While the Company did identify barriers to economic operation, it did so only cursorily.

Rather than completing the analyses mandated by the Commission, the Company stated:

> Minnesota Power has initiated an investigation into the alternative for economic dispatch to determine the potential operating conditions that exist at each Boswell unit and to identify potential solutions. At this time, it is too early in the investigative phase to report on conditions and potential solutions with any certainty. Minnesota Power will continue to consider this topic in its Integrated Resource Plan which will be filed on October 1, 2020, and next year's Self-Commitment filing.

2020 Compliance Filing at 6. As discussed in greater detail below, Minnesota Power repeated this dodge over and over in response to information requests. Even more surprisingly, the Company at times stated that information directly responsive to the Commission's investigation was "outside the scope" of the proceeding. Minnesota has punted completing the analyses required by Commission Order to its Integrated Resource Plan "and next year's Self-Commitment filing" – i.e., to an unspecified future date. Of course, the Company has also proposed to delay its Integrated Resource Plan by several additional months, having already received one significant extension.

Our analysis found that Minnesota Power continues to self-commit Boswell units 3 and 4, resulting in excess costs to customers. In fact, it showed that units operated uneconomically for close to or over half of all operational hours in 2017 and 2019, and nearly a third of operations hours in 2018. We concluded that moving the Boswell units to economic commitment would benefit customers.

As a result, we recommend that the Commission 1) require Minnesota Power to maintain standardized records sufficient to demonstrate they have used forward-looking analyses to inform dispatch decisions; 2) signal that the Commission will, in the next true-up proceeding, disallow recovery of fuel costs for times when coal plants were operated uneconomically in a manner that is not justified by such forward-looking analyses; and 3) require Minnesota Power to identify any proposed new coal contracts to the Commission, and to submit them for prudence review in fuel clause adjustment proceedings, before signing any such contracts.

II. DEFINITIONS

The concepts of self-commitment and economic dispatch are central to this docket. For consistency, we will rely on definitions from Minnesota Power's Annual Compliance Filing when possible.

- **Self-commitment.** Minnesota Power defines self-commitment (also referred to as a "must-run" status) as a utility practice in which it commits a resource into the MISO market at its minimum operating level regardless of economics and makes the unit available for dispatch by MISO.[2] When a utility elects to self-commit a unit, the unit is not assured sufficient revenues from the market to make whole its costs. This is in contrast to economic commitment, where MISO commits the unit only when it is economical to do so. MISO only provides a day-ahead price signal, which for some generators is insufficient, or may lead to excessive starts during the year. For this reason, self-commitment is common in MISO for units with long or costly start-up and shut-down parameters.[3] In absence of a formal multi-day MISO process, some utilities have established mechanisms for approximating economic self-commitment determinations to avoid excessive operations during extended periods of low market prices.
- **Economic dispatch.** Economic dispatch is when a utility allows MISO to dispatch a committed resource economically between its minimum and maximum operating levels. This is in contrast to self-scheduled dispatch, where a utility submits an hourly schedule to MISO on how it should dispatch a unit between its minimum and maximum operating levels, regardless of economics. In this filing, Minnesota Power confusingly appears to use the term "economic dispatch" to refer to *both* dispatch of a unit above its minimum operating level once it is already committed, and the entire process of economically committing and dispatching a unit. It is our understanding that Minnesota Power currently allows MISO to economically dispatch its Boswell units between their minimum and maximum operating levels and has initiated an investigation into moving its Boswell units to full economic commitment and dispatch. For the sake of clarity, in these comments, we use the term "economic commitment" to refer to the entire process of economically committing and dispatching a unit.

[2] Annual Compliance Filing of Minnesota Power, Docket No. Docket No. E999/CI-19-704, page 3.

[3] MISO, April 2020, *MISO 'self-commitment' trends: Most coal generation is dispatched economically.* Available at: https://cdn.misoenergy.org/202004%20Self-Commitment%20MISO%20Trends%20443759.pdf.

III. SUMMARY OF FINDINGS AND RECOMMENDATIONS

In this section, we summarize our findings and present our recommendations.

A. Key Findings

- **In its filing, Minnesota Power did not analyze the costs and benefits of moving Boswell 3 and 4 to economic commitment, nor did it analyze the potential to move the units to seasonal operation.**

- **During the reporting period, Minnesota Power frequently uneconomically self-committed Boswell Units 3 and 4.** Minnesota Power self-commits the Boswell units up to each unit's minimum operating level 100 percent of the time that the units are not in outage, regardless of economics.

- **Minnesota Power's reliance on self-commitment without the use of forward-looking analysis has resulted in many instances of avoidable, sustained losses.** Minnesota Power's failure to conduct forward-looking analyses to inform unit commitment decisions has resulted in [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] periods of consecutive hourly losses at Boswell Units 3 and 4 from 2017 to 2019, with losses totaling [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS]**. Moreover, the units operated uneconomically for close to or over half of all operational hours in 2017 and 2019 and nearly a third of operational hours in 2018.

- **Minnesota Power's claim that the Boswell units provided a net benefit to its customers during the 18-month reporting period (July 2018 through December 2019) is based on an incomplete accounting of short-run marginal costs by omitting variable predictive maintenance.** If those costs were included in Minnesota Power's variable O&M costs, the percentage of hours in which Minnesota Power found that Boswell Units 3 and 4 operated uneconomically would be greater.

- **Minnesota Power could generate over [TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS] in additional revenue for its customers by decreasing the minimum operating level of its units.** Our analysis finds that by reducing the minimum operating level of each unit by half, Minnesota Power could have increased net revenues for its customers by [**TRADE SECRET DATA BEGINS… TRADE SECRET DATA ENDS**] from 2017 through 2019.

- **Minnesota Power has not demonstrated that Boswell Units 3 and 4 represent the lowest cost option for meeting its resource adequacy requirements, or for obtaining its reliability and ancillary services.** Minnesota Power has conducted neither a robust

technical nor economic analysis exploring the costs and benefits of meeting its resource adequacy requirements through other means. Furthermore, Minnesota Power has not demonstrated that the uneconomic operation of Boswell Units 3 and 4 is justified by the need for reliability and ancillary services from those units. It may be possible for Minnesota Power to obtain needed reliability and ancillary services through less costly means.

B. Recommendations

- **The Commission should find Minnesota Power did not comply with its November 13, 2019 Order.**

- **In the absence of a multi-day commitment market at MISO, the Commission should require Minnesota Power to establish a clear and auditable mechanism of determining whether its commitment decisions are in the best interests of ratepayers, or else require Minnesota Power to use MISO's economic commitment status for both Boswell 3 and Boswell 4.** Our analysis indicates that Boswell 3 and 4 should be moved to economic commitment status. The Commission should require Minnesota Power to track and maintain for review regular forward-looking evaluations of unit commitment strategies. Minnesota Power should be required to utilize day-ahead locational marginal price (LMP) forecasts, unit operational costs, and unit start-up and shut-down costs to determine on at least a day-ahead basis, taking the full 24-hour period of expected revenues into account, whether to designate a unit as economic or must-run, or to take it offline. Minnesota Power should be required to retain this analysis to allow the Commission to evaluate whether a unit's commitment decision maximizes its economic value to Minnesota Power's customers.

- **The Commission should indicate that in Minnesota Power's next Fuel Clause Adjustment True-Up proceeding, it will disallow Minnesota Power's recovery from ratepayers any fuel and variable operations and maintenance (O&M) costs incurred as a result of Minnesota Power's uneconomic dispatch of Boswell 3 and 4, where not supported by the forward-looking analyses described above.** The reasonableness of unit commitment practices should be evaluated based on an analysis that incorporates predictive maintenance costs—and any other excluded costs that scale with and are impacted by plant operations—into the variable costs that Minnesota Power uses to make its unit commitment decisions.

- **The Commission should require Minnesota Power to evaluate, in its upcoming IRP, whether there are lower cost alternatives for meeting its resource adequacy requirements, and for obtaining reliability and ancillary services.** Alternatives

include, but are not limited to, the construction of new generation facilities, bi-lateral capacity purchases, and the purchase of capacity through the MISO capacity auction.

- **In its next IRP, Minnesota Power should also be required to analyze whether reducing the minimum operating levels at Boswell Units 3 and 4 would benefit customers.**

- **The Commission should require utilities to identify any proposed new coal contracts in Fuel Clause Adjustment proceedings, and to submit them for prudence review those proceedings, before signing any such contracts.** It should also signal that it will not allow utilities to recover from ratepayers future costs associated with new coal contracts that include fixed cost terms of service, or take or pay or liquidated damages provisions. The Commission should also indicate that any fuel contracts that contractually prohibit disclosure of the contracts' terms without Commission order is per se counter to the public interest.

IV. LEGAL STANDARD OF REVIEW

The Commission has the authority and the duty to ensure fuel costs are reasonable. Minn. Stat. § 216B.16, Subd. 6, provides the Commission with the authority to determine "just and reasonable rates" for public utilities. Proposed energy cost adjustments are considered to be a change in rates and so are subject to the same standard of review. Minn. R. 7825.2390 ("When a utility proposes new or revised electric energy...adjustment provisions, the proposal is considered a change in rates and must be reviewed according to commission rules and practices relating to utility rate changes."). To meet this standard, a utility must demonstrate that it has taken actions to minimize its fuel costs. Minn. R. 7825.2800.

Strong Commission oversight of utilities' decisions is the regulatory substitute for the consequences of free and open competition. "If a competitive enterprise tried to impose on its customers costs from imprudent actions, the customers could take their business to a more efficient provider. A utility's ratepayers have no such choice."[4] Within its assigned territory, each utility has a legal monopoly over retail electric service. Absent regulatory oversight, a utility protected from competition lacks incentive to perform as if subject to competition: "Management of unregulated business subject to the free interplay of competitive forces have no alternative to efficiency. If they are to remain competitive, they must constantly be on the

[4] *Long Island Lighting Co*., Case No. 27563, 71 PUR 4th 262 (N.Y. Pub. Serv. Comm'n, Nov 16, 1985).

lookout for cost economies and cost savings. Public utility management, on the other hand, does not have quite the same incentive."[5] A utility's motivation to act prudently arises instead from the prospect that the Commission will disallow imprudent costs.[6] The core of prudence analysis is whether captive customers can reasonably be asked to pay for a utility's choices.

The Commission has moved all fuel costs out of rate cases and into fuel clause adjustment dockets.[7] The Commission also recently reformed the fuel clause adjustment process. Under the new process:

> each utility will forecast its monthly fuel costs for the upcoming year in an annual filing, and will charge those forecasted rates unless the utility can show a significant unforeseen impact on those rates during the forecasted year. At the end of the forecasted year, each utility will compare its forecasted rates with its actual fuel costs incurred throughout the year, and will refund any overcollections or show prudence of costs before recovering under-collections.[8]

It would therefore be appropriate for the Commission to address issues with utilities' self-commitment and self-scheduling practices in annual Fuel Clause Adjustment forecast filings and annual true-up filings.

V. MINNESOTA POWER FAILED TO COMPLETE THE ANALYSES REQUIRED BY COMMISSION ORDER.

Minnesota Power has entirely failed to conduct the analysis required by the Commission in its *Order Accepting 2017-2018 Electric Reports and Setting Additional Requirements, In the Matter of the Review of the 2017-2018 Annual Automatic Adjustment Report for All Electric Utilities*, Docket No. E-999/AA-18-373, Nov. 13, 2019. In that Order, the Commission instructed that:

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[5] *Midwestern Gas Transmission Co. v. E. Tenn. Nat. Gas Co.*, 36 FPC 61, 70, 64 P.U.R.3d 433 (1966), *aff'd sub nom. Midwestern Gas Transmission Co. v. FPC*, 388 F.2d 444 (7th Cir. 1968).

[6] *See, e.g., U.S. Gypsum, Inc*., 735 N.E.2d at 797 ("As a quid pro quo for being granted a monopoly … the utility is subject to regulation by the state to ensure that it is prudently investing its revenues in order to provide the best and most efficient service possible to the consumer.").

[7] *Order Approving Compliance Filings, In the Matter of an Investigation into the Appropriateness of Continuing to Permit Electric Energy Cost Adjustments*, Docket No. E-999/CI-03-802, Nov 5, 2019, at 4.

[8] *Order Approving Additional Details of New Fuel Clause Adjustment Process, In the Matter of an Investigation into the Appropriateness of Continuing to Permit Electric Energy Cost Adjustments,* Docket No. E-999/CI-03-802, June 12, 2019.

> Minnesota Power, Otter Tail, and Xcel shall submit an annual compliance filing analyzing the potential options for seasonal dispatch generally, and potential options and strategies for utilizing "economic" commitments for specific coal-fired generating plants. The utilities shall include a specific explanation of barriers or limitations to each of these potential options, including but not limited to technical limits of the units and contract requirements (shared ownership, steam offtake contracts, minimum fuel supply requirements, etc.) as relevant, on March 1, 2020, and each year thereafter.

Id., Order Point 8. In its filing, Minnesota Power did not analyze potential options for seasonal dispatch, nor did it analyze potential "options and strategies for utilizing 'economic' commitments" at its coal plants. The Company did identify barriers to economic operation, but only cursorily.

Rather than completing the analyses mandated by the Commission, the Company stated:

> Minnesota Power has initiated an investigation into the alternative for economic dispatch to determine the potential operating conditions that exist at each Boswell unit and to identify potential solutions. At this time, it is too early in the investigative phase to report on conditions and potential solutions with any certainty. Minnesota Power will continue to consider this topic in its Integrated Resource Plan which will be filed on October 1, 2020, and next year's Self-Commitment filing.

2020 Compliance Filing at 6. In short, Minnesota Power did not complete the analyses required by the Commission, and has punted its compliance to its Integrated Resource Plan or a subsequent self-commitment docket.

Minnesota Power asserted this same response to multiple information requests by intervenors. For example, the utility stated in its compliance filing that each of the Boswell units has different operating parameters, such as start up, ramp rate, and minimum down time. The Department of Commerce asked MP to provide the minimum downtime, time required to come online, and minimum time online for each unit. MP responded that "for Boswell Units 3 and 4, Minnesota Power is currently investigating what these parameters need to be for economic dispatch in the MISO market…."[9] Similarly, Sierra Club asked for costs incurred each time a unit shuts down and restarts. Minnesota Power responded:

> Each time a unit shuts down and restarts, we would have incremental costs for fuel, labor, additional reagents, and additional maintenance due to associated impacts from thermal cycling. At this time, it is too early in the investigative phase to report on specific costs or

[9] Minnesota Power Response to DOC IR 10.

impacts to margins with any certainty, other than start-up costs, which were referenced in DOC IR 12 & 13 and outlined below.[10]

Sierra Club also asked for the lead time required to bring units online;[11] how the company evaluates whether and when the amount of forecasted energy market losses resulting from self-commitment outweigh the costs of damage due to starts and stops;[12] and whether the company "performs economic analyses to inform its unit commitment decisions (i.e., whether to designate them as must run or take them offline for economic reasons)."[13] To all of these questions, the utility responded that "it is too early in the investigative phase to report" this information.

When asked whether MP has "conducted any analysis of whether to switch its units to seasonal operations, or of the feasibility of doing so," the utility responded, again, that "Minnesota Power is currently in the process of evaluating seasonal dispatch and economic dispatch to determine the potential operating conditions that exist at each Boswell unit. At this time, it is too early in the evaluation to report on conditions and potential solutions with any certainty."[14] The utility also objected to Sierra Club's question as to whether the utility had looked at the costs and benefits of modifying coal units to lower their minimum operating levels as "outside the scope."[15]

VI. MINNESOTA POWER'S OWN ANALYSIS SHOWS ITS PRACTICE OF SELF-COMMITTING BOSWELL 3 & 4 HARMED CUSTOMERS DURING THE REPORTING PERIOD.

A. Minnesota Power Self-Commits Boswell Units 3 and 4 into MISO.

Minnesota Power operates the Boswell facility, comprised of two baseload coal units, in the MISO markets. Collectively, Boswell Units 3 and 4 represent approximately 1,000 megawatts (MW) of baseload generation.[16] Minnesota Power offers Boswell Units 3 and 4 into MISO with a must-run status 100 percent of the time that the units are not in outage, meaning Minnesota Power self-commits the units and allows MISO to dispatch the units economically between their minimum and maximum capacity.[17]

[10] Minnesota Power Response to IR SC 11.
[11] Minnesota Power Response to IR SC 13.
[12] Minnesota Power Response to IR SC 14.
[13] Minnesota Power Response to IR SC 15.
[14] Minnesota Power Response to IR SC 18.
[15] Minnesota Power Response to IR SC 10 and 23.
[16] Annual Compliance Filing of Minnesota Power, Docket No. Docket No. E999/CI-19-704, page 3.
[17] Annual Compliance Filing of Minnesota Power, Docket No. Docket No. E999/CI-19-704, page 5.

Minnesota Power is the sole owner of Boswell Unit 3 and has joint ownership of Boswell Unit 4 (80 percent share) with WPPI Energy (20 percent share).[18]

B. A review of Minnesota Power's Filing shows that most of its revenue from Boswell units 3 & 4 occurred in [TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS].

Based on the incomplete data Minnesota Power provided as Attachment 1 to its Annual Compliance Filing (which, as discussed further below, does not include all relevant variable costs), Boswell Unit 3 and Minnesota Power's share of Boswell Unit 4 appear to have collectively provided $32.0 million in net revenues for ratepayers from July 1, 2018 through December 31 2019 (the time period of the current filing), and [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] from 2017 through 2019 (see CONFIDENTIAL Table 1).

CONFIDENTIAL Table 1. Net Operational Revenues of Boswell Units 3 and 4 ($ Millions)

Year	Boswell Unit 3	Boswell Unit 4
	[TRADE SECRET DATA BEGINS…	
2017		
2018		
2019		
Total		
	…TRADE SECRET DATA ENDS]	

Sources: Attachment 1 (Trade Secret) to Annual Compliance Filing of Minnesota Power. Synapse analysis.

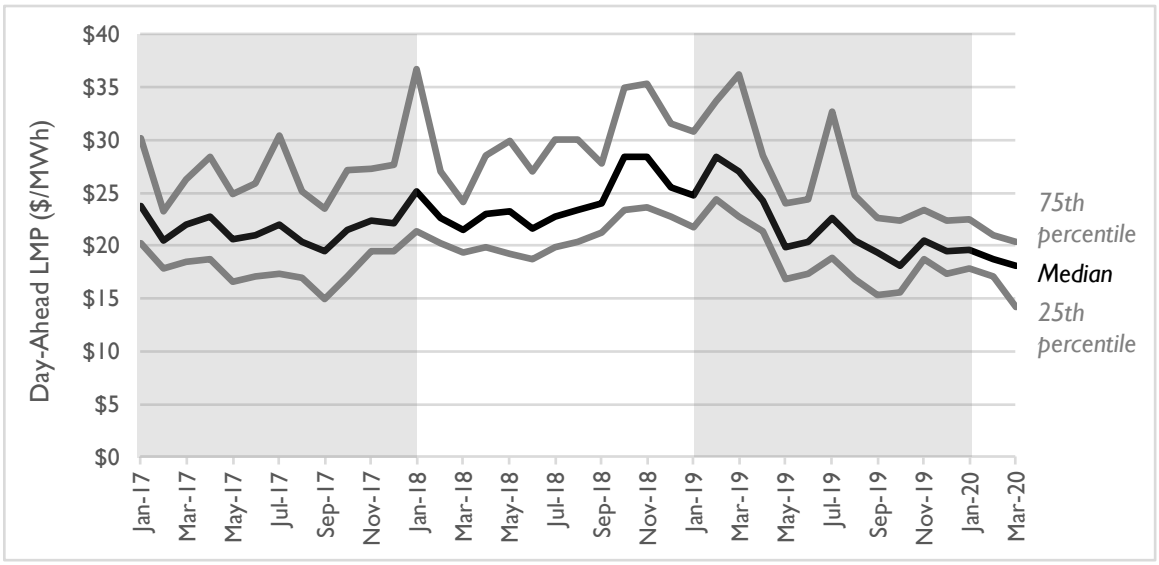
However, [**TRADE SECRET DATA BEGINS… TRADE SECRET DATA ENDS**], when LMPs were generally higher (Figure 1). In 2017 and 2019, [**TRADE SECRET DATA BEGINS… TRADE SECRET DATA ENDS**]. Boswell Unit 3 incurred net operational losses during [**TRADE SECRET DATA BEGINS… TRADE SECRET DATA ENDS**], and

[18] Annual Compliance Filing of Minnesota Power, Docket No. Docket No. E999/CI-19-704, page 8.

[TRADE SECRET DATA BEGINS… TRADE SECRET DATA ENDS], while Boswell Unit 4 incurred net operational losses during [**TRADE SECRET DATA BEGINS… TRADE SECRET DATA ENDS**] and [**TRADE SECRET DATA BEGINS… TRADE SECRET DATA ENDS**].

Now, in 2020, amidst a backdrop of low LMPs driven by low demand and low gas prices, it is likely Boswell Units 3 and 4's economic performance will be worse than in any of the prior three years.

Figure 1. Median (25th and 75th Percentile) Day-Ahead LMPs at Boswell 4



Sources: MISO Market Data. Authors' analyses. LMPs were higher in 2018, leading to higher revenue in that year. LMPs in 2020 are significantly lower, indicating that the Boswell units will likely perform worse this year than in the prior 3 years.

C. A review of Minnesota Power's own analysis indicates that reliance on self-commitment without the use of forward-looking analysis has resulted in many instances of avoidable, sustained losses.

In its Annual Compliance Filing, Minnesota Power asserts that "the Boswell facility provided $32.0 million in net energy benefit to customers for the period of July 1, 2018 through December 31, 2019" and that its analysis "demonstrates Minnesota Power is utilizing the MISO tariff and the self-commitment provisions at the Boswell facility to service its customers in an effective

manner."[19] However, this statement does not address whether the units' net operational revenues could have been greater had MP committed and dispatched them differently—for example, by utilizing economic commitment or by reducing the units' minimum operating levels. We explore these alternatives in depth in the sections below and find that: Minnesota Power could have generated greater net operational revenues had it employed forward-looking analyses to inform its commitment and dispatch decisions; and that moving Boswell 3 & 4 to economic commitment would benefit customers.

Minnesota Power self-committed Boswell Units 3 and 4 100 percent of the time that the units were not in outage from 2017 through 2019. In doing so, it often committed its units at times in which unit costs were greater than day-ahead LMPs. As shown in Table 2, Minnesota Power operated Boswell Units 3 and 4 uneconomically—that is, when unit costs were greater than day-ahead LMPs—for close to or over half of their operational hours in 2017 and 2019, and for nearly a third of operational hours in 2018.

Table 2. Operational Hours in which Boswell Units 3 and 4 Generated Uneconomically

Year	Boswell 3	Boswell 4
2017	58%	56%
2018	30%	30%
2019	40%	48%

Sources: Trade Secret Attachment 1 to Annual Compliance Filing of Minnesota Power. Synapse analysis.

The values in Table 2 rely on Minnesota Power's incomplete data provided in Attachment 1 to its Annual Compliance Filing, in which predictive maintenance costs are excluded from variable O&M costs, as discussed further below. If those costs were included in Minnesota Power's variable O&M costs, the percentage of hours in which Minnesota Power found that Boswell Units 3 and 4 operated uneconomically would be greater.

[19] Annual Compliance Filing of Minnesota Power, Docket No. Docket No. E999/CI-19-704, page 4.

D. Minnesota Power's data shows that forward-looking evaluations using LMP forecasts, unit operational costs, and start-up and shut-down times and cost could have avoided losses to customers.

When evaluating whether to commit a unit, it is prudent to weigh the projected costs and benefits of doing so. The evaluation should incorporate factors such as LMP forecasts, unit operational costs, and unit start-up and shut-down times and costs.

In general, it is more economical for Minnesota Power to de-commit Boswell Units 3 and 4 during periods in which (a) the units will likely incur net losses over a time period greater than the time it takes to first cool-down to "warm" status and then start back up from warm status; and (b) the expected losses over that period exceed the warm startup costs. Boswell Units 3 and 4 have a cool-down time to warm of [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] hours, warm startup times of [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] hours, respectively, and incremental fuel costs for startup of **[TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**], respectively.[20]

We find that Minnesota Power self-committed Boswell Units 3 and 4 during [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] periods in which the units incurred (a) consecutive losses for more hours than the units' cool-down time to warm plus warm startup time (a total of [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] hours for Boswell Units 3 and 4, respectively), and (b) incurred losses that exceeded the incremental fuel costs for startup.

Specifically, between 2017 and 2019, we find:

- There were [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] instances in which Boswell Unit 3 incurred hourly losses for more than [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] consecutive hours with total losses exceeding incremental fuel costs for startup, with total net operational losses exceeding [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**].

- There were [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] instances in which Boswell Unit 4 incurred hourly losses for more than **TRADE**

[20] Minnesota Power's response to Sierra Club Information Request 17. In its response, Minnesota Power states that it is "investigating what the typical incremental start-up costs are for O&M and wear & tear, but can provide an update on fuel cost incurred during a start-up based on historical performance." Therefore, while our analysis relies on the historical incremental fuel costs for startup that Minnesota Power provided, we acknowledge that the total typical incremental start-up costs may be higher.

SECRET DATA BEGINS… [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] consecutive hours with total losses exceeding incremental fuel costs for startup, with total net operational losses exceeding [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**].

Further, during [**TRADE SECRET DATA BEGINS… TRADE SECRET DATA ENDS**] of those instances, Minnesota Power self-committed the dispatch of Boswell Units 3 and 4 for particularly long periods of consecutive losses—longer even than the combined cool-down time to cold ([**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] hours) plus the cold startup time ([**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] hours for Boswell Units 3 and 4, respectively).

- From [**TRADE SECRET DATA BEGINS… TRADE SECRET DATA ENDS**], Minnesota Power self-committed Boswell Unit 3 for [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] consecutive hours of net losses. This is shown in CONFIDENTIAL Figure 2 below, with cleared generation in the top plot and hourly net operational revenue on the bottom plot. In every hour during this time period, unit costs exceed day-ahead LMPs. Over this multi-day period, the unit incurred [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] in net operational losses.

- During the same period from [**TRADE SECRET DATA BEGINS… TRADE SECRET DATA ENDS**], Minnesota Power self-committed Boswell Unit 4 for [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] consecutive hours of net losses. Over this multi-day period, the unit incurred [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] in in net operational losses.

CONFIDENTIAL Figure 2. Boswell Unit 3 Net Operational Revenues
[TRADE SECRET DATA BEGINS…
…TRADE SECRET DATA ENDS]

Sources: Trade Secret Attachment 1 to Annual Compliance Filing of Minnesota Power. Synapse analysis.

These findings rely on the data that Minnesota Power provided in Attachment 1 to its Annual Compliance Filing. As we mentioned above, the variable O&M costs in Attachment 1 do not include predictive maintenance costs. We would likely find more instances of consecutive hourly losses if the variable costs that Minnesota Power submits to the MISO offer curve included all

costs that scale with and are impacted by plant operations, including predictive maintenance costs.

This type of imprudent commitment can be avoided—or, at worst, the losses can be significantly mitigated—by using a consistent and auditable framework for assessing coal unit commitment in light of expected forward-looking market energy prices, or the use of economic commitment through MISO's market framework to avoid long periods of unnecessary and imprudent self-commitment.

E. Contrary to its assertions, it appears that Minnesota Power does not regularly review whether its operation of Boswell is maximizing benefits to customers.

In its Compliance Filing, Minnesota Power assures the Commission that "[t]he Company evaluates its energy market strategy and market performance for its generation portfolio on a regular basis to ensure the assets are providing value to customers within the MISO market construct. If the Company receives a signal that the current market strategy is no longer providing value to customers, then the strategy is reevaluated."[21] The Company asserts that "[b]y optimizing Minnesota Power's generation fleet in the MISO market, customers benefit by receiving the market benefits of the resources."[22]

However, Minnesota Power's responses to information requests on this point are highly suggestive that the utility does not, in fact, conduct any such evaluations. Sierra Club asked Minnesota Power to explain how regularly the company evaluates its market strategy.[23] The Company responded that it evaluates its market strategy on an "annual and seasonal basis."[24] Sierra Club asked the utility to explain what kind of "signals" would cause the Company to reevaluate its market strategy, and the process whereby they would conduct such an evaluation. Minnesota Power responded that the "Company uses MISO energy and capacity market conditions as a signal to evaluate our market strategy…. When the Company were to receive [sic] a signal that the strategy should be adjusted, we consider alternatives and vet operating options and reliability impacts."[25] In short, the utility's responses were vague to the point of meaninglessness. In response to our request that the utility provide all such evaluations and analyses performed to "evaluate its energy market strategy" for the last 5 years, the Company

[21] Compliance Filing at 3.
[22] Compliance Filing at 5.
[23] Minnesota Response to Sierra Club IR 25.
[24] *Id.*
[25] *Id.*

objected "as this information request seeks a study or studies that are outside the scope of this docket."[26]

As explained above, operating factors such as start up, ramp rate, minimum downtime, and incremental start up and shut down costs should all be considered in a forward-looking analysis of whether to self-commit units. In response to information requests for data on those issues, Minnesota Power repeatedly responded that the utility is "currently investigating what these parameters need to be for economic dispatch in the MISO market"[27] and that it is "too early in the investigative phase to report on specific costs or impacts to margins with any certainty, other than start-up costs…."[28] [29] [30] The utility provided the same response to the question of whether it "performs economic analyses to inform its unit commitment decisions (i.e., whether to designate them as must run or take them offline for economic reasons)."[31] In short, it is apparent that the utility does not, in fact, regularly assess whether the units are maximizing economic benefit to customers.

F. To ensure the utility is maximizing Boswell's economic value to its customers, the Commission should require Minnesota Power to evaluate and defend its self-commitment decisions using a consistent and auditable framework based on forward-looking energy prices as part of the Fuel Clause Adjustment proceedings.

In its Annual Compliance Filing, Minnesota Power states that "if the units['] operations were changed to shut down more frequently to try to capture these particular time periods [of net losses], the additional start-up costs (i.e. fuel cost and wear & tear) and operational limitations would need to be considered." This is exactly why forward-looking analyses should be used to make unit commitment decisions: so that multi-day revenue projections can be compared against full operational costs.

When evaluating whether to commit a unit, it is prudent a utility to evaluate the projected costs and benefits of doing so based on LMP forecasts, unit operational costs, unit start-up and shut-down times and costs, and any other relevant factors. As discussed above, Minnesota Power, not

[26] *Id.*
[27] Minnesota Power Response to DOC IR 10.
[28] Minnesota Power Response to IR SC 11.
[29] Minnesota Power Response to IR SC 13.
[30] Minnesota Power Response to IR SC 14.
[31] Minnesota Power Response to IR SC 15.

stakeholders, bears the burden of proof to support that it is making prudent commitment decisions on behalf of its customers.

Many of the losses discussed in the sections above likely could have been avoided had Minnesota Power employed a consistent and auditable framework for assessing coal unit commitment in light of expected forward-market energy prices, or the use of economic commitment through MISO's market framework to avoid long periods of unnecessary and imprudent self-commitment.

While it is reasonable for a utility to sometimes be wrong in its forecasts and decisions, it is unreasonable for a utility to: 1) have the tools to inform its decisions (namely, forward-looking analyses), 2) nevertheless make uninformed decisions that lead to losses that may have been avoidable had it used those tools, and 3) make ratepayers pay for those losses.

Thus, as long as Minnesota Power maintains its practice of self-committing Boswell Units 3 and 4, we recommend the Commission require Minnesota Power to track, and maintain for review, regular forward-looking evaluations of self-commitment to evaluate whether a unit's commitment maximizes economic value to Minnesota Power's customers. These evaluations should incorporate LMP forecasts, unit operational costs, and unit start-up and shut-down costs to determine, on at least a day-ahead basis, whether to designate a unit as economic or must-run, or take it offline.

G. In the next Fuel Clause Adjustment proceeding, the Commission should disallow recovery from ratepayers costs unnecessarily incurred due to uneconomic commitment of Boswell 3 & 4.

The instances of sustained net operational losses identified above illustrate the benefits that economic commitment can provide to Minnesota Power's customers. By switching Boswell Units 3 and 4 from self-commitment to economic commitment, Minnesota Power's customers would be shielded from long periods of consecutive losses. Therefore, we recommend that the Commission require Minnesota Power to establish a clear and auditable mechanism of determining if its commitment decisions are in the best interests of ratepayers. We further recommend that the Commission signal that it will disallow recovery of unnecessarily incurred variable O&M and fuel costs for periods when Boswell Units 3 and 4 are not operated economically in the next fuel clause adjustment true-up proceeding. This should disincentivize Minnesota Power from operating the units uneconomically for sustained periods of time.

VII. PROBLEMS WITH MINNESOTA POWER'S ANALYSIS

A. Minnesota Power excluded variable predictive maintenance costs and other non-fuel costs that scale with operation from its MISO offer curves and from its analysis in this proceeding.

It is also important to note that Minnesota Power's conclusion that Boswell Units 3 and 4 generated net positive benefits is based on only a subset of unit costs: the fuel and variable O&M costs that Minnesota Power includes in its MISO offer curve.[32] It does not include predictive maintenance and other non-fuel costs that are scalable with operation. By failing to include these costs as variable O&M costs in its pricing curve, Minnesota Power is likely understating the amount of time the plants are operating uneconomically. It is likely that had Minnesota Power employed a more rigorous assessment of variable O&M costs, it could have realized additional savings. Moreover, Minnesota Power's failure to include these costs in its MISO offer curve biases the market in favor of dispatching its plants over others that may be lower cost to operate.

Capital investment and some O&M costs, such as labor, are generally fixed (i.e., they do not vary as a function of unit output) and are therefore reasonable to exclude from an offer curve. However, a wide range of other O&M costs scale with unit operations in a predictable and known manner—either as a function of runtime or output. These variable costs are avoidable and deferrable if units are idled or dispatched at lower levels, and they therefore should be incorporated into unit commitment and dispatch decision-making. For example, maintenance conducted as a function of use or operational hours (often referred to as a predictive maintenance) should be considered variable, as should expenses for water, chemicals and reagents, and waste disposal. Minnesota Power excludes predictive maintenance in Boswell Units 3 and 4's unit costs.[33] In doing so, Minnesota Power does not accurately account for all the avoidable costs associated with committing and dispatching its units.

Minnesota Power's exclusion of these variable O&M costs results in Minnesota Power submitting into MISO an offer curve that is lower than the actual variable cost to operate the unit. In 2018, Boswell 3's average non-fuel variable O&M costs were [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] and Boswell 4's average non-fuel variable O&M costs were [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA**

[32] In its response to Sierra Club Information Request 9a, Minnesota Power lists the short-term variable costs used for the purposes of dispatch at its coal units as: the changes in reagents, fuel handling equipment incremental wear-and-tear, ash handling costs, and fuel costs defined as the average cost of inventory on hand for the generating station.

[33] Minnesota Power's response to Sierra Club Information Request 32c.

ENDS].[34] This is [**TRADE SECRET DATA BEGINS… TRADE SECRET DATA ENDS**], respectively) than the $3.29/MWh non-fuel variable O&M costs in 2020 dollars that Horizons Energy assigns to 1,000+ MW coal plants in its Fall 2019 North American Market Database, based primarily on historical O&M data from FERC Form 1. By submitting low variable costs to the MISO offer curve, Minnesota Power biases the market in favor of committing and dispatching Minnesota Power's units over other units that may actually be lower cost to operate. This also allows Minnesota Power to make the units look more economic than they are when comparing costs to the LMP revenues earned, such as when relying on the data in Attachment 1. It is important to note that these costs do not disappear just because they are not included in the MISO offer curve; instead, they are passed onto customers through rates as fixed costs in a less transparent manner.

As such, we recommend that the Commission require Minnesota Power to evaluate its unit commitment practices using an analysis that incorporates predictive maintenance costs—and any other excluded costs that scale with and are impacted by plant operations—into the variable costs that Minnesota Power uses to make its unit commitment.

B. Minnesota Power has not adequately evaluated of the costs and benefits of moving Boswell Units 3 and 4 to seasonal operations as ordered by the Commission.

The Commission instructed utilities to include in their Compliance Filing an evaluation of the costs and benefits of moving the plants to seasonal operations; that is, decommitting and/or removing its plants from the market during shoulder seasons. This would allow the capacity of the plant to always be available in case of extreme circumstances, but would remove the plant from daily commitment and dispatch decision-making processes during low-demand months of the year. The Commission recently approved Xcel Energy's plan to offer its coal units into the MISO market on a seasonal basis.[35]

CONFIDENTIAL Figure 3, below, shows that Boswell Units 3 and 4 have earned the majority of their net operational revenues in the [**TRADE SECRET DATA BEGINS… TRADE SECRET DATA ENDS]**. Thus, decommitting the units in low price seasons could offer savings to customers.

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[34] Minnesota Power's response to Fresh Energy Information Request 1a.

[35] Northern States Power Company d/b/a Xcel Energy, December 20, 2019, *Petition: Plan to Offer Generating Resources into the MISO Market on a Seasonal Basis*. Available at: https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7b6045256F-0000-CB17-8630-C2EEBC86BB66%7d&documentTitle=201912-158520-01.

CONFIDENTIAL Figure 3. Net Operational Revenues by Season, 2017-2019
[TRADE SECRET DATA BEGINS…
…TRADE SECRET DATA ENDS]
Sources: Trade Secret Attachment 1 to Annual Compliance Filing of Minnesota Power. Synapse analysis.

In its Filing, Minnesota Power asserts several barriers to moving Boswell 3 & 4 to seasonal operation, including capacity requirements and the need for reliability and ancillary services. However, the utility did not adequately substantiate those barriers, nor did it analyze whether it could obtain the benefits it currently receives from Boswell 3 & 4 more cost-effectively through other means.

1. Minnesota Power has not substantiated its claims that Boswell Units 3 and 4 are needed to meet resource adequacy requirements.

Minnesota Power states that Boswell Units 3 and 4 are needed to meet its resource adequacy requirements in MISO. However, Minnesota Power has not adequately established a capacity need in MISO in the absence of one or both of its Boswell units, on either a seasonal basis or with a full unit retirement.

According to the most recent Planning Resource Auction (PRA), MISO Zone 1 has surplus capacity and is an exporting zone.[36] Thus, Minnesota Power operates within a MISO zone with low capacity prices. While the onus is always on the utility to quantitatively justify the ways in which it meets its resource adequacy requirements, operating within an exporting zone with a capacity surplus makes the need for a quantitative justification even more necessary.

Instead, Minnesota Power has failed to conduct robust technical and economic analyses exploring the costs and benefits of meeting its resource adequacy requirement through any other means. In its Annual Compliance Filing, Minnesota Power states that it must "comply with MISO's Resource Adequacy requirements by offering its capacity resources that either clear the annual Planning Resource Auction or are used in the annual Company Fixed Resource Adequacy Plan ("FRAP")." Minnesota Power continues, stating that the "Boswell units are used to meet Minnesota Power resource adequacy requirements and, therefore, are required to offer the available energy for dispatch each day."[37] While this may be true, Minnesota Power provides no economic analysis comparing the benefits of meeting those requirements with Boswell Units 3

[36] MISO 2019 / 2020 PRA Results. April 12, 2019. Available at: https://cdn.misoenergy.org/20190412_PRA_Results_Posting336165.pdf.
[37] Annual Compliance Filing of Minnesota Power, Docket No. Docket No. E999/CI-19-704, page 5.

and 4 relative to alternative compliance. It may very well be that meeting the requirements through alternatives such as the construction of new generation facilities, bi-lateral capacity purchases, or the purchase of capacity through the MISO capacity auction would be more cost-effective than meeting the requirements with the Boswell units. Sierra Club asked Minnesota Power in discovery for information supporting the utility's statement that MISO adequacy requirements represent a barrier to changing how the Boswell units are operated; the utility objected to the question as "outside the scope" of this proceeding.[38]

As such, we recommend the Commission require Minnesota Power to examine in its upcoming Integrated Resource Plan whether it could more cost-effectively meet its MISO resource adequacy requirements through alternative methods, including—but not limited to—the construction of new generation facilities, bi-lateral capacity purchases, and the purchase of capacity through the MISO capacity auction.

2. Minnesota Power has not substantiated its claims that Boswell Units 3 and 4 are needed to provide ancillary and reliability services.

Minnesota Power states that the "majority of the ancillary service revenue [it received from July 1, 2018 through December 31, 2019] came from providing Regulation, which requires [Boswell Units 3 and 4] to increase or decrease generation within seconds to respond to small imbalances due to generation and load variation."[39] It continues, stating that "Boswell can only provide these ancillary services if the units are online and generating at minimum levels."[40]

From July 1, 2018 through December 31, 2019, Boswell Units 3 and 4 received $1 million in revenue by providing ancillary services.[41] This represents 3 percent of the total revenue that Boswell Units 3 and 4 received during that time period. Minnesota Power has not justified the uneconomic operation of Boswell Units 3 and 4 on the basis of providing these ancillary services. It may be that the savings that Minnesota Power would have experienced by offering the Boswell units using economic commitment would have outweighed the $1 million in ancillary revenues these units received. It is also possible that Minnesota Power could obtain reliability services more cost-effectively through other means. In discovery, Sierra Club asked Minnesota Power whether it had conducted any analysis of whether Boswell 3 and 4 represent

[38] Minnesota Power Response to Sierra Club IR 26.
[39] Annual Compliance Filing of Minnesota Power, Docket No. Docket No. E999/CI-19-704, page 10.
[40] *Id.*
[41] Annual Compliance Filing of Minnesota Power, Docket No. Docket No. E999/CI-19-704, pages 9-10.

the least cost manner for the utility to obtain the essential reliability services that its system needs. Minnesota Power objected to this request as outside the scope of the proceeding.[42]

As such, we recommend the Commission require Minnesota Power to include in its upcoming IRP an analysis that compares the costs and benefits of obtaining regulation services from Boswell Units 3 and 4 relative to the costs and benefits associated with alternative means of obtaining reliability services.

C. Minnesota Power Has Not Adequately Analyzed the Potential to Increase the Net Revenues of Boswell Units 3 and 4 by Reducing the Units' Minimum Operating Levels.

Above we discussed a series of analytical and predictive steps that Minnesota Power can and should take to improve unit performance. An additional operational change that Minnesota Power can and should evaluate is reducing the minimum operating levels of Boswell Units 3 and 4, thereby allowing the units to incur fewer losses when it does make sense to maintain operation during periods of low market prices. Sierra Club asked Minnesota Power in discovery whether it had examined the costs and benefits of modifying its coal units to lower their minimum operating levels. Consistent with many other responses in this docket, Minnesota Power objected to this request as "outside the scope" of the investigative proceeding, and re-iterated that it has initiated an investigation into the alternative for economic dispatch.[43]

Minnesota Power states in its Annual Compliance Filing that its "customers benefited from the flexible operations at Boswell that includes backing down during lower market conditions."[44] However, when Boswell Units 3 and 4 are committed, the most that Minnesota Power can back them down to is their minimum operating levels.[45] If Minnesota Power lowered the minimum operating levels of the units, then during times of lower market prices when Minnesota Power wanted to keep the unit online, Minnesota Power would be able to back down the units even lower than it presently can and thus reduce operational losses.

We evaluated the impacts of reducing the minimum operating levels of Boswell Units 3 and 4 by half from 2017 through 2019; i.e., a [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] MW reduction for Boswell Unit 3 and a [**TRADE SECRET DATA**

[42] Minnesota Power Response to Sierra Club IR 28.
[43] Minnesota Power Response to Sierra Club IR 10.
[44] Annual Compliance Filing of Minnesota Tail Power, Docket No. Docket No. E999/CI-19-704, page 4.
[45] Annual Compliance Filing of Minnesota Tail Power, Docket No. Docket No. E999/CI-19-704, page 5.

BEGINS…TRADE SECRET DATA ENDS] MW reduction for Boswell Unit 4.[46] Using the data provided by Minnesota Power as Attachment 1 to its Annual Compliance Filing, we implemented this reduction during hours meeting two conditions: (1) the units cleared for dispatch at the minimum operating level, and (2) the units' costs exceeded day-ahead LMPs (i.e., it was uneconomical for the unit to be dispatched). The units now incurred lower costs in the day-ahead market when unit costs exceeded day-ahead LMPs.

Then, we evaluated the secondary benefits of having the capacity that was removed from the day-ahead market available in the real-time market. Specifically, we allowed the units to dispatch into the real-time market the MW that we removed from the day-ahead market when real-time market prices exceeded unit costs.

We found that the combined primary and secondary benefits of lowering the unit's minimum operating levels would have resulted in [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] in greater net operational benefits for Boswell Unit 3 and [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] in greater net operational benefits for Boswell Unit 4 between 2017 and 2019.

Other utilities have recently taken measures to evaluate and lower the minimum operating levels of their units in order to lower costs and increase operational flexibility. For example, Southwestern Public Service Company (Xcel) recently lowered the minimum operating level at its Tolk and Harrington plants in Texas, and asserted in testimony that this action had provided additional fuel savings for its customers.[47]

While Minnesota Power should first evaluate the costs and feasibility of changing the commitment status of its Boswell units to economic, it should also evaluate the impacts of lowering the minimum operating levels of its units. Doing so would provide Minnesota Power with more flexibility to operate at a lower level during uneconomic market conditions, thereby avoiding unnecessary losses that Minnesota Power passes on to its ratepayers. Therefore, we recommend that the Commission require Minnesota Power to evaluate the costs and feasibility of further reducing its minimum operating levels at both Boswell 3 and Boswell 4 as part of its next IRP.

[46] According to Minnesota Power's response to Sierra Club Information Request 22-TS, the minimum operating level for Boswell Unit 3 is [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS**] MW and the minimum operating level for Boswell Unit 4 is [**TRADE SECRET DATA BEGINS…TRADE SECRET DATA ENDS]** MW.

[47] Rebuttal Testimony of William Grant. SOAH Docket No. 473-19-6677, page 23.

D. Co-Ownership Should Not Justify Continued Uneconomic Operation of Boswell Unit 4.

Minnesota Power stated in its Filing that Boswell Unit 4 is jointly owned with WPPI and that "any changes to operations need to be coordinated with WPPI and agreed upon by both parties." The Department of Commerce asked the utility to provide sections of its operating agreement with WPPI that would limit its ability to offer Boswell 4 economically. Minnesota Power provided the following contractual language:

[**TRADE SECRET DATA BEGINS… TRADE SECRET DATA ENDS**] [48]

However, co-ownership does not excuse the utility's burden of proof in justifying that Boswell unit 4's costs are reasonable. The utility, not ratepayers, is in the position to renegotiate its contract if the terms stand in the way of economic commitment. If Minnesota Power continues to assert that co-ownership of Boswell 4 makes it such that Minnesota Power must offer the unit as a must-run unit and, in so doing, frequently incurs sustained periods of net operational losses, join ownership of Boswell 4 may no longer be serving the best interest of ratepayers.

We therefore recommend that the Commission require Minnesota Power to justify why continued joint ownership of Boswell 4 is prudent and in the best interest of its ratepayers (relative to alternatives) if it results in operating the unit uneconomically for a significant portion of the time and passing on those losses to customers.

E. Minnesota Power has not evaluated the extent to which uneconomic self-commitment of Boswell Units 3 and 4 is artificially suppresses market prices, disadvantaging other market participants.

In its Annual Compliance Filing, Minnesota Power states that:

> A critical assumption in the data set is that if Boswell Units 3 & 4 were moved to economic dispatch the market prices would remain unchanged when the units are offline. Given these are the two largest and remaining baseload generators in the region, there will be increases in market prices within the region when the generator is offline. The net energy benefit of $32.0 million for customers is likely understated, because it doesn't factor

[48] Minnesota Power Response to DOC IR 11-Trade Secret.

> in that replacement energy costs will be higher if the Boswell units were offline.[49]

This statement underscores another problem with Minnesota Power's uneconomic self-commitment of its Boswell units: by uneconomically self-committing its Boswell units, Minnesota Power is artificially suppressing market prices, thereby reducing the revenues received by other lower-cost market participants (including its own other assets) and creating challenges for the entry of new market participants that may offer more economical resources.

A 2019 Sierra Club report, *Playing With Other People's Money: How Non-Economic Coal Operations Distort Energy Market*, found that ratepayers in the electric markets regions of MISO, SPP, ERCOT, and PJM paid $3.5 billion more for energy from 2015-2017 due to the uneconomic dispatch of coal plants, relative to the potential procurement of energy and capacity on the market.[50] The report also found that, had coal generators operated under economic commitment, the median hourly market price would have been $7.7/MWh greater in 2017 (a 30 percent increase). This price suppression reduces market revenues that independent power producers, including renewable energy producers, would receive. As an example, the authors of the report state that a 100 MW wind farm could have been deprived of approximately $2 million in 2017 due to the uneconomic dispatch of coal plants.

Regional transmission organizations have begun to investigate the market impacts of uneconomic coal plant operation. For example, Southwest Power Pool's (SPP) Market Monitoring Unit has recommended that SPP "work to reduce the incidence of self-commitments" to improve price formation and market efficiency.[51] More recently, MISO released the results from an analysis which finds that 12 percent of the coal energy in MISO's day-ahead market from January 1, 2017 through November 13, 2019 was self-committed and dispatched uneconomically.[52] While MISO emphasizes that 88 percent of the region's coal-fired energy in

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[49] Annual Compliance Filing of Minnesota Power, Docket No. Docket No. E999/CI-19-704, page 7.

[50] This issue is described in Sierra Club's 2019 report *Playing With Other People's Money: How Non-Economic Coal Operations Distort Energy Markets*, available at: https://www.sierraclub.org/sites/www.sierraclub.org/files/Other%20Peoples%20Money%20Non-Economic%20Dispatch%20Paper%20Oct%202019.pdf.

[51] SPP Market Monitoring Unit, December 2019, *Self-committing in SPP markets: Overview, impacts, and recommendations*. Available at: https://spp.org/documents/61118/spp%20mmu%20self-commit%20whitepaper.pdf.

[52] MISO, April 2020, *MISO 'self-commitment' trends: Most coal generation is dispatched economically.* Available at: https://cdn.misoenergy.org/202004%20Self-Commitment%20MISO%20Trends%20443759.pdf.

that period was economically dispatched, 12 percent represents a significant percentage of hours of uneconomic dispatch that translates into uneconomic costs that are passed on to ratepayers. It also represents an average, meaning that in many regions the rate of uneconomic dispatch is higher.

This issue further emphasizes the importance of our recommendation above that the Commission signal to Minnesota Power and other utilities that they will not be allowed to recover costs from their customers incurred unnecessarily when they operate their units uneconomically.

F. Minnesota Power entered into a coal contract the terms of which it is legally prohibited from disclosing, limiting the ability of stakeholders and intervenors to evaluate the contracts' economic prudence.

It is worth noting that, as part of discovery in this docket, Fresh Energy and Sierra Club both sought to better understand the terms of Minnesota Power's fuel supply contracts for Boswell 3 and 4. In response to these requests, Minnesota Power asserted that its coal supply contracts contain terms that legally prohibit Minnesota Power from disclosing them, including to stakeholders and intervening parties – even those who have signed a nondisclosure agreement in this proceeding: "Minnesota Power is prohibited to disclose our coal supply and transportation contracts for Boswell 3 and 4 unless ordered to by a court or regulatory body."[53] Moreover, Minnesota Power stated that it was prohibited from even providing the exact contract language that limited its disclosure of contract terms.[54]

By entering into contracts with such terms, Minnesota Power has reduced the transparency of its fuel costs and limited the ability of stakeholders and intervenors to evaluate the economic prudence of entering into those coal contracts. Minnesota Power voluntarily entered a contract that it claims justifies passing costs on to customers, but that contractually prevents groups that have an interest in protecting those customers from reviewing the contract terms. We recommend the Commission find that such contract provisions, by definition, run counter to the public interest. Minnesota Power is the party with the power to negotiate the terms of its fuel contracts, and thus bears the burden of proving that the costs incurred under that contract are in the public interest. Minnesota Power should not be permitted to contractually shield itself from stakeholder review of the prudency of its contracts.

[53] Minnesota Power Response to Fresh Energy IR 3-Trade Secret
[54] Minnesota Power Response to Sierra Club IR 29.

VIII. RESTATEMENT OF RECOMMENDATIONS

- **The Commission should find Minnesota Power did not comply with its November 13, 2019 Order.**

- **In the absence of a multi-day commitment market at MISO, the Commission should require Minnesota Power to establish a clear and auditable mechanism of determining whether its commitment decisions are in the best interests of ratepayers, or else require Minnesota Power to use MISO's economic commitment status for both Boswell 3 and Boswell 4.** Our analysis indicates that Boswell 3 and 4 should be moved to economic commitment status. The Commission should require Minnesota Power to track and maintain for review regular forward-looking evaluations of unit commitment strategies. Minnesota Power should be required to utilize day-ahead locational marginal price (LMP) forecasts, unit operational costs, and unit start-up and shut-down costs to determine on at least a day-ahead basis, taking the full 24-hour period of expected revenues into account, whether to designate a unit as economic or must-run, or to take it offline. Minnesota Power should be required to retain this analysis to allow the Commission to evaluate whether a unit's commitment decision maximizes its economic value to Minnesota Power's customers.

- **The Commission should indicate that in Minnesota Power's next Fuel Clause Adjustment True-Up proceeding, it will disallow Minnesota Power's recovery from ratepayers any fuel and variable operations and maintenance (O&M) costs incurred as a result of Minnesota Power's uneconomic dispatch of Boswell 3 and 4, where not supported by the forward-looking analyses described above.** The reasonableness of unit commitment practices should be evaluated based on an analysis that incorporates predictive maintenance costs—and any other excluded costs that scale with and are impacted by plant operations—into the variable costs that Minnesota Power uses to make its unit commitment decisions.

- **The Commission should require Minnesota Power to evaluate, in its upcoming IRP, whether there are lower cost alternatives for meeting its resource adequacy requirements, and for obtaining reliability and ancillary services.** Alternatives include, but are not limited to, the construction of new generation facilities, bi-lateral capacity purchases, and the purchase of capacity through the MISO capacity auction.

- **In its next IRP, Minnesota Power should also be required to analyze whether reducing the minimum operating levels at Boswell Units 3 and 4 would benefit customers.**

- **The Commission should require utilities to identify any proposed new coal contracts in Fuel Clause Adjustment proceedings, and to submit them for prudence review those proceedings, before signing any such contracts.** It should also signal that it will not allow utilities to recover from ratepayers future costs associated with new coal contracts that include fixed cost terms of service, or take or pay or liquidated damages provisions. The Commission should also indicate that any fuel contracts that contractually prohibit disclosure of the contracts' terms without Commission order is per se counter to the public interest.

Sierra Club respectfully requests the Commission adopt the recommendations above.

Dated: June 8, 2020

Respectfully submitted,

/s/ S. Laurie Williams
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ATTACHMENT A: CALCULATIONS, WORKPAPERS AND UNDERLYING DATA

Please see excel workbook Attachment A separately filed
in Docket 19-704

ATTACHMENT B: RESPONSES TO INFORMATION REQUESTS

Fresh Energy
Information Request

Docket No.:	E-999/CI-19-704		
Requestor:	Isabel Ricker		
Requested From:	Minnesota Power		
Date of Request:	December 11, 2019	Information Request No.	1

Reference:

- Fresh Energy Comments in response to Minnesota Power's May 8, 2019 Filing, Docket No. 18-373, September 24, 2019.
- Minnesota Power response to Fresh Energy IR 1, Docket No. 18-373, June 7, 2019.
- Minnesota Power response to Fresh Energy IR 3, Attachment, Docket No. 18-373, September 14, 2019.

Request:
In our September 24, 2019 comments, Fresh Energy pointed to a differential between the production cost figures in Minnesota Power's May 8, 2019 Compliance Filing and those reflected on the company's FERC Form 1 for 2017 and 2018.[1] Fresh Energy stated:

> We hope that this discrepancy is the result of certain costs being included in the FERC Form 1 report that the utilities do not typically consider variable fuel or O&M costs, or that are not included in the MISO offer curves for these plants. However, we were not able to determine what costs are driving this difference and if they are properly excluded from Otter Tail's analysis.

A. Please provide an itemized list of the expenses included in:

1. Minnesota Power's definition of fuel and variable O&M cost (as used in your MISO offer curve) for 2018 for Boswell units 3 and 4,
2. Minnesota Power's definition of fixed O&M costs for 2018 for Boswell units 3 and 4,
3. The 2018 production costs Minnesota Power submitted via FERC Form 1 (page 402, rows 19-33) for Boswell.

B. Please provide a narrative explanation of how Minnesota Power differentiates between fixed and variable O&M, and approximate ratio of variable to fixed O&M for Boswell.

C. We understand that one or more of Minnesota Power's fuel contracts for coal generating plants (as described in Minnesota Power's response to PUC IR 3 in Docket 18-373) contain terms of service (e.g. take or pay, liquidated damages) that may impact Minnesota Power's treatment of fuel as variable (marginal) versus fixed. Please confirm whether this is correct.

[1] Fresh Energy Comments, September 24, 2019, Docket 18-373, at page 15-16

1. If yes: Note which contracts this applies to, the specific terms of these contracts, and the amount of each that Minnesota Power assigns to marginal (variable) costs and fixed costs for the applicable unit(s). Describe your methodology for assigning fuel cost under these contracts to variable or fixed costs.

RESPONSE:

A. 1. Fuel as used in the offer curve for dispatch in the MISO energy market is defined as the average cost of inventory on hand for the generating station.

Variable O&M costs are defined by Minnesota Power as the changes in reagents, fuel handling equipment incremental wear-and-tear, and ash handling costs. These cost will increase or decrease depending on the production level of the generating unit. Below are the variable O&M Costs in $/MWh we use in our offer into the MISO Energy market for economic unit dispatch in 2018.

Dispatch Variable O&M $/MWh	
	2018
[TRADE SECRET DATA BEGINS	
Boswell 3	[redacted]
Boswell 4	

TRADE SECRET DATA ENDS]

2. Fixed O&M costs are defined as all O&M expenses not related to fuel, reagents, fuel handling equipment incremental wear-and-tear, and ash handling costs. For example, but not limited to, fixed O&M costs include salaries, employee benefits, and contractor work.

3. The Production Costs listed in the 2018 FERC Form 1, Page 402, includes all four Boswell units and Rapids Energy Center. The production costs included in the analysis Minnesota Power filed in Docket AA-18-373 on May 8, 2019, only included fuel costs related specifically to Boswell Units 3 & 4 since the retirement of Boswell Units 1 & 2 had already been planned. Boswell Units 3 & 4 fuel costs are a portion of line 20 in the FERC Form 1. Approximately $23 million of the expenses included in the 2018 FERC Form 1, are related to Boswell Units 1&2 O&M and fuel for Rapids Energy Center.

B. Minnesota Power defines fixed and variable O&M above in response A1 and A2. Based on 2018 actuals the ratio of variable to fixed O&M for Boswell Units 3&4 was approximately 20 percent, excluding fuel.

C. Minnesota Power does have fuel contracts with **[TRADE SECRET DATA BEGINS** [redacted] **TRADE SECRET DATA ENDS]**

Preparer: Hillary Creurer
Title: Regulatory Compliance Administrator
Department: Regulatory Compliance & Administration
Telephone: (218) 355-3455
Date: January 17, 2020

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐ Nonpublic ☒ Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request: March 10, 2020
Type of Inquiry:	General	Response Due: March 24, 2020

Requested by:	Laurie Williams, Sierra Club
Email Address(es):	laurie.williams@sierraclub.org
Phone Number(s):	303-454-3358

Request Number: **9**
Topic: General
Reference(s): Click or tap here to enter text.

Request: Regarding the development of Minnesota's hourly energy market bids and dispatch decisions:

a. **Indicate which production costs are considered to be variable on a short-term basis by Minnesota Power for the purposes of dispatch at its existing coal units (e.g. fuel costs, variable operations and maintenance costs, emissions costs, ash handling costs, effluent costs, etc.).**
b. **Identify if there are any fuel costs at Minnesota Power's existing coal units that Minnesota Power considers fixed for the purposes of commitment decisions. Provide a detailed explanation of how the fixed component is determined, and provide workpapers and documentation demonstrating the fixed and variable breakdown.**

RESPONSE:

a. Variable O&M costs are defined by Minnesota Power as the changes in reagents, fuel handling equipment incremental wear-and-tear, and ash handling costs.
b. Fuel as used in the offer curve for dispatch in the MISO energy market is defined as the average cost of inventory on hand for the generating station.

To be completed by responder

Response Date:	March 24, 2020
Response by:	Hillary A. Creurer
Email Address:	hcreurer@allete.com
Phone Number:	(218) 355-3455

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic	☒Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	March 23, 2020
Type of Inquiry:	General	Response Due:	April 2, 2020

Requested by:	Laurie Williams, Sierra Club
Email Address(es):	laurie.williams@sierraclub.org
Phone Number(s):	303-454-3358

Request Number: **10**
Topic: General
Reference(s): Click or tap here to enter text.

Request: Has the Company evaluated the costs and benefits of modifying any of its coal units to have a lower minimum operating level?

a. **If yes, please provide all analysis the company has conducted, and internal reports on the costs and benefits of this option.**
b. **If no, please explain why the Company has not considered this option and conducted this analysis.**

Response:

The Company objects, this information request seeks a study or studies that are outside the scope of this docket.

Although the Company objects, Minnesota Power has initiated an investigation into the alternative for economic dispatch to determine the potential operating conditions that exist at each Boswell unit. At this time, it is too early in the investigative phase to report on conditions and potential solutions with any certainty. Minnesota Power will continue to consider this topic, in its Integrated Resource Plan which will be filed on October 1, 2020, and next year's Self-Commitment filing.

To be completed by responder

Response Date: April 6, 2020
Response by: Eric Palmer
Email Address: epalmer@mnpower.com
Phone Number: 218-355-3839

Minnesota Department of Commerce
85 7th Place East | Suite 280 | St. Paul, MN 55101
Information Request

Docket Number: E999/CI-19-704 ☐Nonpublic ☒Public
Requested From: Hillary A. Creurer, Minnesota Power Date of Request: 3/3/2020
Type of Inquiry: General Response Due: 3/13/2020

SEND RESPONSE VIA EMAIL TO: Utility.Discovery@state.mn.us as well as the assigned analyst(s).
Assigned Analyst(s): Steve Rakow
Email Address(es): stephen.rakow@state.mn.us
Phone Number(s): 651-539-1833

ADDITIONAL INSTRUCTIONS:
Each response must be submitted as a text searchable PDF, unless otherwise directed. Please include the docket number, request number, and respondent name and title on the answers. If your response contains Trade Secret data, please include a public copy.

Request Number:	**10**
Topic:	Click or tap here to enter text.
Reference(s):	Click or tap here to enter text.

Request:

Minnesota Power's *Annual Compliance Filing* states that "Each generating unit has different operating parameters, such as … start up, ramp rate, minimum down time, minimum time online, and other parameters that are taken into consideration as part of the energy offer."

For each unit included in Attachment 1, please provide:

a. the minimum downtime;
b. the time required to come on-line; and
c. the minimum time online.

For each parameter, please provide the duration and an explanation as to how the duration was determined.

Response:
a-c) In the compliance filing, Minnesota Power references the generation fleet in general with regard to operating parameters associated with economic market dispatch. However, for Boswell Units 3 and 4, Minnesota Power is currently investigating what these parameters need to be for economic dispatch in the MISO market as the Company stated in this Compliance filling with the Minnesota Public Utilities Commission on March 2, 2020, Docket No. E999/CI-19-704.

To be completed by responder

Response Date: March 13, 2020
Response by: Laurel Udenberg
Email Address: ludenberg@mnpower.com
Phone Number: (218) 723-7537

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic	☒Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	March 23, 2020
Type of Inquiry:	General	Response Due:	April 2, 2020

Requested by:	Laurie Williams, Sierra Club
Email Address(es):	laurie.williams@sierraclub.org
Phone Number(s):	303-454-3358

Request Number:	**11**
Topic:	General
Reference(s):	Click or tap here to enter text.

Request: For each of the Company's coal units, please outline the categories of costs the Company incurs each time a unit shuts down. This includes but is not limited to: the cost to restart, foregone expected positive margins during minimum downtimes, increase in maintenance and capital costs related to unit cycling, and fuel and O&M cycling costs.

a. Please provide the amounts of each cost in each category (i.e., separated out by category).

Response:

a. Each time a unit shuts down and restarts, we would have incremental costs for fuel, labor, additional reagents, and additional maintenance due to associated impacts from thermal cycling. At this time, it is too early in the investigative phase to report on specific costs or impacts to margins with any certainty, other than start-up costs, which were referenced in DOC IR 12 & 13 and outlined below.

i. Boswell unit 3, Minnesota Power is investigating what the typical incremental start-up costs are for O&M and wear & tear, but can provide an update on fuel cost incurred during a start-up based on historical performance. The typical incremental fuel cost for startup on Boswell Unit 3 in 2019 was **[TRADE SECRET DATA BEGINS** [redacted] **TRADE SECRET DATA ENDS]**. This cost reflects an average gas price of **[TRADE SECRET DATA BEGINS** [redacted] **TRADE SECRET DATA ENDS]**.

ii. Boswell unit 4, Minnesota Power is investigating what the typical incremental start-up costs are for O&M and wear & tear, but can provide an update on fuel cost incurred during a start-up based on historical performance. The typical incremental fuel cost for startup on Boswell Unit 4 in 2019 was **[TRADE SECRET**

To be completed by responder

Response Date:	April 6, 2020
Response by:	Amanda Kluge
Email Address:	akluge@mnpower.com
Phone Number:	(218) 313-4412

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic	☒Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	March 23, 2020
Type of Inquiry:	General	Response Due:	April 2, 2020

Requested by:	Laurie Williams, Sierra Club
Email Address(es):	laurie.williams@sierraclub.org
Phone Number(s):	303-454-3358

DATA BEGINS [redacted] **TRADE SECRET DATA ENDS]**. Note this is the fuel cost at start-up for both Minnesota Power and WPPI share of the unit. This cost reflects an average gas price of **[TRADE SECRET DATA BEGINS** [redacted] **TRADE SECRET DATA ENDS]**.

To be completed by responder

Response Date:	April 6, 2020
Response by:	Amanda Kluge
Email Address:	akluge@mnpower.com
Phone Number:	(218) 313-4412

Minnesota Department of Commerce
85 7th Place East | Suite 280 | St. Paul, MN 55101
Information Request

Docket Number: E999/CI-19-704 ☐Nonpublic ☒Public
Requested From: Hillary A. Creurer, Minnesota Power Date of Request: 3/3/2020
Type of Inquiry: General Response Due: 3/13/2020

SEND RESPONSE VIA EMAIL TO: Utility.Discovery@state.mn.us as well as the assigned analyst(s).
Assigned Analyst(s): Steve Rakow
Email Address(es): stephen.rakow@state.mn.us
Phone Number(s): 651-539-1833

ADDITIONAL INSTRUCTIONS:
Each response must be submitted as a text searchable PDF, unless otherwise directed. Please include the docket number, request number, and respondent name and title on the answers. If your response contains Trade Secret data, please include a public copy.

Request Number:	**11**
Topic:	Click or tap here to enter text.
Reference(s):	Click or tap here to enter text.

Request:

Minnesota Power's *Annual Compliance Filing* states that Boswell Unit 4 is a jointly owned unit with WPPI Energy and that "Any changes to the operations at Boswell Unit 4 need to be coordinated with WPPI Energy and agreed upon by both parties." Please provide the sections of any agreements between Minnesota Power and WPPI Energy that the Company believes limit Minnesota Power's ability to offer Boswell unit 4 economically and the resulting limit employed by Minnesota Power.

RESPONSE:
In the Clay Boswell Steam Electric Generating Station Unit No. 4 Operations, Ownership and Power Sales Agreement between Minnesota Power and the Wisconsin Public Power Incorporated System dated January 12, 1990, Section 2.3.7 Operations Beyond Net Generating Capability it states,

[TRADE SECRET DATA BEGINS [redacted] **RADE SECRET DATA ENDS]**

To be completed by responder

Response Date: March 13, 2020
Response by: Hillary A. Creurer
Email Address: hcreurer@allete.com
Phone Number: (218) 355-3455

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic ☒Public	
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	March 23, 2020
Type of Inquiry:	General	Response Due:	April 2, 2020

Requested by:	Laurie Williams, Sierra Club
Email Address(es):	laurie.williams@sierraclub.org
Phone Number(s):	303-454-3358

Request Number: **13**
Topic: General
Reference(s): Click or tap here to enter text.

Request: For each of the Company's coal units:

a. **Please provide the lead time (i.e., the time between when a unit is shut down and can come back online at its minimum operating level, including cooldown and start up) required to bring an offline unit back online.**
b. **Please explain how the Company takes the lead time for each unit into account when making commitment decisions.**

Response:

a. At this time, it is too early in the investigative phase to report on lead time required to bring an offline unit back online. This is currently being investigated, including the units capabilities to start-up/shut-down and manage emission limits.

b. Startup and unit parameters (including lead time) for economic dispatch would be offered into MISO, and from there the unit would be dispatched by MISO for economic and/or reliability operations.

To be completed by responder

Response Date:	April 6, 2020
Response by:	Amanda Kluge
Email Address:	akluge@mnpower.com
Phone Number:	(218) 313-4412

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic	☒Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	March 23, 2020
Type of Inquiry:	General	Response Due:	April 2, 2020

Requested by:	Laurie Williams, Sierra Club
Email Address(es):	laurie.williams@sierraclub.org
Phone Number(s):	303-454-3358

Request Number: **14**
Topic: General
Reference(s): Click or tap here to enter text.

Request: Please list the costs and other factors that the Company takes into account when deciding when to shut down and start up a generator.

a. **Please explain how the Company evaluates whether and when the amount of forecasted energy market losses resulting from self-commitment outweigh the costs of damage due to starts and stops.**

Response:

Minnesota Power has initiated an investigation into the incremental O&M and wear and tear costs associated with starts and stops. At this time, it is too early in the investigative phase to report on factors that would lead to such decisions with any certainty.

To be completed by responder

Response Date:	April 6, 2020
Response by:	Amanda Kluge
Email Address:	akluge@mnpower.com
Phone Number:	(218) 313-4412

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic	☒Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	March 23, 2020
Type of Inquiry:	General	Response Due:	April 2, 2020

Requested by: Laurie Williams, Sierra Club
Email Address(es): laurie.williams@sierraclub.org
Phone Number(s): 303-454-3358

Request Number: **15**
Topic: General
Reference(s): Click or tap here to enter text.

Request: Regarding the Company's unit commitment decision-making process for its coal units:

a. **Does the Company perform economic analyses to inform its unit commitment decisions for its coal units (i.e., decisions regarding whether to designate these units as must run or take them offline for economic reasons)?**
b. **If not, explain why not.**
c. **If so:**
    a. **Please provide all such analyses conducted since 2017 in native, machine-readable format. Please use the attached Excel document as an example template for the analysis and underlying data we seek.**
    b. **Please identify each category of cost and revenue accounted for in such analyses.**
    c. **Please indicate whether such analyses are conducted differently for periods immediately preceding or following unit outages and explain any differences.**

Response:

The Company objects, this information request seeks a study or studies that are outside the scope of this docket.

Although the Company objects, Minnesota Power has initiated an investigation into the alternative for economic dispatch to determine the potential operating conditions that exist at each Boswell unit. At this time, it is too early in the investigative phase to report on conditions and potential solutions with any certainty. Minnesota Power will continue to consider this topic in its Integrated Resource Plan which will be filed on October 1, 2020, and next year's Self-Commitment filing.

To be completed by responder

Response Date: April 6, 2020

Response by: Eric Palmer
Email Address: epalmer@mnpower.com
Phone Number: 218-355-3839

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic	☒Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	March 23, 2020
Type of Inquiry:	General	Response Due:	April 2, 2020

Requested by:	Laurie Williams, Sierra Club
Email Address(es):	laurie.williams@sierraclub.org
Phone Number(s):	303-454-3358

Request Number: **17**
Topic: General
Reference(s): Click or tap here to enter text.

Request: For each of the Company's coal units, please identify:

a. **Average cold startup costs.**
b. **Average warm startup costs.**
c. **Cold start-up time.**
d. **Warm start-up time.**
e. **Cool-down time to cold.**
f. **Cool-down time to warm.**

Response:

a. The average fuel usage for warm starts and similar the cold start and the same value is used by Minnesota power for both cold and warm starts.
    i. Boswell unit 3, Minnesota Power is investigating what the typical incremental start-up costs are for O&M and wear & tear, but can provide an update on fuel cost incurred during a start-up based on historical performance. The typical incremental fuel cost for startup on Boswell Unit 3 in 2019 was **[TRADE SECRET DATA BEGINS** [redacted] **TRADE SECRET DATA ENDS]**. This cost reflects an average gas price of **[TRADE SECRET DATA BEGINS** [redacted] **TRADE SECRET DATA ENDS]**.

    Boswell unit 4, Minnesota Power is investigating what the typical incremental start-up costs are for O&M and wear & tear, but can provide an update on fuel cost incurred during a start-up based on historical performance. The typical incremental fuel cost for startup on Boswell Unit 4 in 2019 was **[TRADE SECRET DATA BEGINS** [redacted] **TRADE SECRET DATA ENDS]**. Note this is the fuel cost at start-up for both Minnesota Power and WPPI share of the unit. This cost reflects an average gas price of **[TRADE SECRET DATA BEGINS** [redacted] **TRADE SECRET DATA ENDS]**.

To be completed by responder

Response Date:	April 6, 2020
Response by:	Amanda Kluge
Email Address:	akluge@mnpower.com
Phone Number:	(218) 313-4412

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic	☒Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	March 23, 2020
Type of Inquiry:	General	Response Due:	April 2, 2020

Requested by: Laurie Williams, Sierra Club
Email Address(es): laurie.williams@sierraclub.org
Phone Number(s): 303-454-3358

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b. Refer to item a above.

c. Cold Start-Up Time: Boswell unit 3 - 10 hours cold start time
Boswell unit 4 - 14 hours cold start time

d. Warm Start-Up Time: Boswell unit 3 - 6 hours warm start time
Boswell unit 4 - 8 hours warm start time

e. Cool-down time to cold: Boswell unit 3 - 72 hours to cold
Boswell unit 4 - 72 hours to cold

f. Cool-down time to warm: Boswell unit 3 - 24 hours to warm
Boswell unit 4 - 24 hours to warm

To be completed by responder

Response Date: April 6, 2020
Response by: Amanda Kluge
Email Address: akluge@mnpower.com
Phone Number: (218) 313-4412

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic	☒Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	March 23, 2020
Type of Inquiry:	General	Response Due:	April 2, 2020

Requested by: Laurie Williams, Sierra Club
Email Address(es): laurie.williams@sierraclub.org
Phone Number(s): 303-454-3358

Request Number: **18**
Topic: General
Reference(s): Click or tap here to enter text.

Request: Has the Company conducted any analysis of whether to switch its units to seasonal operations, or of the feasibility of doing so?

a. **If so, provide all such analyses in native, machine-readable format.**
b. **If not, please describe the extent to which the Company has considered such a switch.**
c. **If the Company has not considered a switch to seasonal operations, please explain why.**

Response:

Minnesota Power is currently in the process of evaluating seasonal dispatch and economic dispatch to determine the potential operating conditions that exist at each Boswell unit. At this time, it is too early in the evaluation to report on conditions and potential solutions with any certainty. Minnesota Power will continue to consider this topic, including seasonal operations, in its Integrated Resource Plan which will be filed on October 1, 2020, and next year's Self-Commitment filing.

To be completed by responder

Response Date: April 6, 2020

Response by: Eric Palmer
Email Address: epalmer@mnpower.com
Phone Number: 218-355-3839

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic	☒Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	April 27, 2020
Type of Inquiry:	General	Response Due:	May 7, 2020

Requested by:	Laurie Williams, Sierra Club
Email Address(es):	laurie.williams@sierraclub.org
Phone Number(s):	303-454-3358

Request Number: 23

Request: Please refer to your response to Sierra Club IR 10. Please confirm or deny that you have not analyzed whether Boswell 3 or 4's minimum operating levels could be reduced (including an evaluation of the costs and benefits of reducing the minimum operating levels).

Answer:

As noted in Sierra Club IR 10, the Company objects as this information request seeks a study or studies that are outside the scope of this docket.

To be completed by responder

Response Date:	May 15, 2020		
Response by:	Laurel Udenberg	|	David Moeller
Email Address:	ludenerg@mnpower.com	|	dmoeller@allete.com
Phone Number:	218-723-7537	|	218-723-3963

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic	☒Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	April 27, 2020
Type of Inquiry:	General	Response Due:	May 7, 2020

Requested by: Laurie Williams, Sierra Club
Email Address(es): laurie.williams@sierraclub.org
Phone Number(s): 303-454-3358

Request Number: 25

Request: Refer to Minnesota Power's Compliance Filing, page three, and the statement that: "The Company evaluates its energy market strategy and market performance for its generation portfolio on a regular basis to ensure the assets are providing value to customers within the MISO market construct. If the Company receives a signal that the current market strategy is no longer providing value to customers, then the strategy is reevaluated."

a) Please quantify "regular basis" – that is, how regularly does the Company evaluate its energy market strategy (in terms of days, months, or years)?
b) Please define "signal" as used here in reference to the Company's evaluation of its market strategy
    i. Please provide examples of signals that have caused the Company to reevaluate its energy market strategy in the past.
c) Please describe the process that the Company uses to evaluate its energy market strategy when it receives a signal that the current strategy is no longer providing value to customers. Please provide specific examples.
d) Please provide all evaluations and analyses performed by MN Power to "evaluate its energy market strategy and market performance" for the last 5 years.

Answer:

a) The Company evaluates the energy market strategy on a "regular basis," which is defined as on an annual and seasonal basis.
b) The Company uses the MISO energy and capacity market conditions as a signal to evaluate our market strategy.
c) As stated in subpart (a) the Company evaluates the operating strategies of the units on an annual and seasonal basis. When the Company were to receive a signal that the strategy should be adjusted, we consider alternatives and vet operating options and reliability impacts.
d) The Company objects as this information request seeks a study or studies that are outside the scope of this docket.

To be completed by responder

Response Date:	May 15, 2020		
Response by:	Eric Palmer	|	David Moeller
Email Address:	epalmer@mnpower.com	|	dmoeller@allete.com
Phone Number:	(218) 355-3839	|	(218) 723-3963

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic	☒Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	April 27, 2020
Type of Inquiry:	General	Response Due:	May 7, 2020

Requested by:	Laurie Williams, Sierra Club
Email Address(es):	laurie.williams@sierraclub.org
Phone Number(s):	303-454-3358

Request Number: 26

Request: Refer to Minnesota Power's Compliance Filing, page five, and the Company's discussion of MISO Resource Adequacy requirements (beginning with the first full paragraph on that page).

a) Please provide a copy of Minnesota Power's current FRAP.
b) Please explain the binding requirements set in Minnesota Power's FRAP.
c) Please explain whether Minnesota Power can modify its FRAP and the process for doing so.
d) Please indicate whether Minnesota Power has considered modifying its FRAP.

Answer:

a) Minnesota Power objects to this question as it is outside the scope of this docket.
b) Please see the MISO Module E tariff for binding requirements.
c) The process the Company follows to modify the FRAP is defined by the MISO Module E tariff.
d) The Company evaluates the FRAP strategy on an annual basis prior to the annual MISO Planning Resource Auction process.

To be completed by responder

Response Date:	May 15, 2020		
Response by:	Eric Palmer	|	David Moeller
Email Address:	epalmer@mnpower.com	|	dmoeller@allete.com
Phone Number:	(218) 355-3839	|	(218) 723-3963

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic	☒Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	April 27, 2020
Type of Inquiry:	General	Response Due:	May 7, 2020

Requested by:	Laurie Williams, Sierra Club
Email Address(es):	laurie.williams@sierraclub.org
Phone Number(s):	303-454-3358

Request Number: 28

Request: Refer to Minnesota Power's Compliance Filing, page 7, and the Company's discussion of "essential reliability services" provided by Boswell Units 3 & 4.

a) Has Minnesota Power conducted any analysis evaluating whether operation of Boswell Units 3 & 4 is the least cost manner for Minnesota Power to obtain the essential reliability services that its system needs? If so, please provide these analyses.

b) Please provide the value (in dollars) of the essential reliability services provided by Boswell Units 3 & 4 as discussed in this paragraph.

c) Has Minnesota Power conducted any analysis evaluating alternative resources that can provide the reliability services that its system needs? If so, please provide these analyses.

Answer:

The Company objects, this information request seeks a study or studies that are outside the scope of this docket.

Although the Company objects, Minnesota Power has initiated an investigation into the alternative for economic dispatch to determine the potential operating conditions that exist at each Boswell unit. At this time, it is too early in the investigative phase to report on conditions and potential solutions with any certainty. Minnesota Power will continue to consider this topic, in its Integrated Resource Plan which is currently scheduled to be filed on October 1, 2020, and next year's Self-Commitment filing.

To be completed by responder

Response Date:	May 15, 2020		
Response by:	Eric Palmer	|	David Moeller
Email Address:	epalmer@mnpower.com	|	dmoeller@allete.com
Phone Number:	(218) 355-3839	|	(218) 723-3963

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic	☒Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	April 27, 2020
Type of Inquiry:	General	Response Due:	May 7, 2020

Requested by: Laurie Williams, Sierra Club
Email Address(es): laurie.williams@sierraclub.org
Phone Number(s): 303-454-3358

Request Number: 29

Request: Refer to Minnesota Power's response to Sierra Club's IR 6b.

a) Please provide the exact language in the coal contracts for Boswell Units 3 and 4 that indicates that Minnesota Power is prohibited from disclosing the contracts unless ordered to do so by a governing regulator or legal authority.

b) Please verify under oath that all of coal contracts contain a provision that prohibits disclosure of the contracts unless ordered to do so by a governing regulator or legal authority.

Answer:

a) As noted in IR 6, Minnesota Power's coal contracts limit disclosure by Minnesota Power to third parties; however, Minnesota Power can confirm that this language does exist.

b) See response to a) above.

To be completed by responder

Response Date: May 15, 2020
Response by: Kathy Benham
Email Address: kbenham@mnpower.com
Phone Number: (218) 313-4402

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic	☒Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	April 27, 2020
Type of Inquiry:	General	Response Due:	May 7, 2020

Requested by:	Laurie Williams, Sierra Club
Email Address(es):	laurie.williams@sierraclub.org
Phone Number(s):	303-454-3358

Request Number: 32

Request: Refer to Minnesota Power's response to Sierra Club's IR 9 regarding Minnesota Power's definition of fuel and variable O&M costs for Boswell Units 3 and 4.

a) Please provide a description of all components of fuel and variable O&M costs that MISO requires Minnesota Power to include in a units' offer curve.
b) For each unit, please define all components of fuel costs that go into calculating "the average cost of inventory on hand."
c) Please confirm that variable O&M costs as defined by Minnesota Power do not include any predictive operations or maintenance costs aside from equipment used for fuel handing.
d) Is it Minnesota Power's position that predictive maintenance is not considered a variable cost?
    i. If yes, please explain why.
    ii. If no, please explain why these costs were not included in Minnesota Power's variable costs as presented in Attachment 1 to the Company's Annual Compliance filing.
e) Is it Minnesota Power's position that no predictive maintenance costs are avoidable or deferrable based on changes in how regularly and at what level a unit operates?

Answer:

a) Fuel used in the offer curve for dispatch in the MISO energy market is defined as the average cost of inventory on hand as described in subpart (b) below. As noted in Sierra IR09, the variable O&M components are reagents, fuel handling equipment wear-and-tear, and ash handling costs.
b) To calculate the average cost of inventory on hand, each month one takes the beginning inventory balance (tons and costs), adds all costs and tons associated with the current month's fuel deliveries, and a new inventory balance is calculated (beginning balance plus current month receipts). This new inventory value is then applied to current month's coal burn.
c) There are no predictive operations or maintenance costs included in variable O&M. All variable O&M costs are based on historical averages based on a representative time period.

To be completed by responder

Response Date:	May 15, 2020				
Response by:	Amanda Kluge	|	Laurel Udenberg	|	Kathy Benham
Email Address:	akluge@mnpower.com	|	ludenberg@mnpower.com	|	kbenham@mnpower.com
Phone Number:	(218) 313-4412	|	(218) 723-7537	|	(218) 313-4402

Sierra Club Information Request

Docket Number:	E999/CI-19-704	☐Nonpublic	☒Public
Requested From:	Hillary Creurer, Minnesota Power	Date of Request:	April 27, 2020
Type of Inquiry:	General	Response Due:	May 7, 2020

Requested by:	Laurie Williams, Sierra Club
Email Address(es):	laurie.williams@sierraclub.org
Phone Number(s):	303-454-3358

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d) Predictive maintenance activities are defined and performed based on the asset criticality and potential failure modes that the asset could experience. These activities do not significantly change based on incremental changes in production.

e) Overall maintenance costs for a unit change based on its operating mission. The three types of maintenance performed are corrective, preventative, and predictive. Corrective maintenance costs typically decrease with lower production, since repairs are generally required less often and components wear out on a longer term basis. Preventative maintenance costs generally increase with lower production, since the plant and its components were designed for continuous operation at a base load. Failures become more difficult to predict and require additional inspections. When a unit is operated in an intermittent fashion and it's called on in the MISO market, it is critical that the unit operate reliably. To support this, the preventative maintenance strategy is developed based on the asset criticality, repair history, and OEM recommendations and includes more frequent equipment inspections when the unit is not in operation. Failure to run reliably results in increased costs for the customer and impacts to xEFORD, which impacts unit accreditation, which could further increase customer cost. Predictive maintenance is typically performed with the asset in operation and shouldn't significantly change based on operating scenario.

   The maintenance strategy is adapted based on the unit's role in the MISO market. For units that cycle, the strategy is to be ready when called upon to operate. The effects of this change in operation vary based on number of cycles per year, the type of cycle (hot, intermediate, or cold), the plant design and age, as well as the plant reliability history prior to cycling. Some ways we mitigate costs of an alternate operating strategy are changes to operating procedures, training for employees, recordkeeping to track and trend failures, and inspections to detect increases in thermal fatigue and equipment wear, which requires more frequent inspections than a base loaded unit.

To be completed by responder

Response Date:	May 15, 2020				
Response by:	Amanda Kluge	|	Laurel Udenberg	|	Kathy Benham
Email Address:	akluge@mnpower.com	|	ludenberg@mnpower.com	|	kbenham@mnpower.com
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CERTIFICATE OF SERVICE

I, S. Laurie Williams, hereby certify that I have this day, served or caused to be served copies of the following document on the attached list of persons by electronic filing or e-mail.

Sierra Club Initial Comments: Minnesota Power 2020 Annual Compliance Filing

Docket No. E999/CI-19-704

Dated this 8th day of June 2020

/s/ S. Laurie Williams

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Service List Member Information

Electronic Service Member(s)

Last Name	First Name	Email	Company Name	Delivery Method	View Trade Secret
Anderson	Christopher	canderson@allete.com	Minnesota Power	Electronic Service	No
Archer	Alison C	aarcher@misoenergy.org	MISO	Electronic Service	No
Commerce Attorneys	Generic Notice	commerce.attorneys@ag.state.mn.us	Office of the Attorney General-DOC	Electronic Service	Yes
Ferguson	Sharon	sharon.ferguson@state.mn.us	Department of Commerce	Electronic Service	No
Gerhardson	Bruce	bgerhardson@otpco.com	Otter Tail Power Company	Electronic Service	No
Gleckner	Allen	gleckner@fresh-energy.org	Fresh Energy	Electronic Service	No
Havey	Kim	kim.havey@minneapolismn.gov	City of Minneapolis	Electronic Service	No
Larson	Douglas	dlarson@dakotaelectric.com	Dakota Electric Association	Electronic Service	No
Oehlerking Boes	Leann	lboes@mnpower.com	Minnesota Power	Electronic Service	No
Olson	Randy	rolson@dakotaelectric.com	Dakota Electric Association	Electronic Service	No
Residential Utilities Division	Generic Notice	residential.utilities@ag.state.mn.us	Office of the Attorney General-RUD	Electronic Service	Yes
Ricker	Isabel	ricker@fresh-energy.org	Fresh Energy	Electronic Service	No
Seuffert	Will	Will.Seuffert@state.mn.us	Public Utilities Commission	Electronic Service	Yes
Sweet	Lynnette	Regulatory.records@xcelenergy.com	Xcel Energy	Electronic Service	No
Tommerdahl	Stuart	stommerdahl@otpco.com	Otter Tail Power Company	Electronic Service	No
Tulloh	Brian	btulloh@misoenergy.org	MISO	Electronic Service	No

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