

Supplemental Staff Briefing Papers

Meeting Date April 22, 2021 Agenda Item 2*

Company Northern States Power Company d/b/a Xcel Energy

Docket No. **G-002/M-20-633**

In the Matter of the Petition by Northern States Power Company for Approval of Changes in Contract Demand Entitlements

Issues Should the Commission accept Northern States Power Company's (Xcel Energy's) proposed level of demand entitlements and allow Xcel Energy to recover the associated demand costs through the monthly Purchased Gas Adjustment (PGA) effective November 1, 2020.

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Supplemental



Relevant Documents

Date

Docket No. G-999/CI-21-135
Xcel Energy - Initial Report (Public)

April 9, 2021

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The attached materials are work papers of the Commission Staff. They are intended for use by the Public Utilities Commission and are based upon information already in the record unless noted otherwise.

I. Statement of the Issues

Should the Commission accept Northern States Power Company's (Xcel Energy's) proposed level of demand entitlements and allow Xcel Energy to recover the associated demand costs through the monthly Purchased Gas Adjustment (PGA) effective November 1, 2020.

II. Supplemental Briefing

On April 9, 2021, Xcel filed a Report in response to the Commission's investigation of natural gas prices from February 2021 (Docket No. 21-135). In that report, Xcel disclosed information relative to capacity planning (Attached hereto as Attachment A).¹ Specifically, Xcel disclosed that three of its peak shaving plants (Wescott, Sibley and Maplewood) were not available during February 2021 and have not been available since apparently sometime in January 2021. Xcel stated that the natural gas from these facilities was not needed to meet customer demand during the February 2021 weather event.

These peak shaving plants made up 246,000² Dth of the total 908,071³ Dth of Xcel's Minnesota Company⁴ peak day capacity in this demand entitlement filing (docket 20-633) that the Company said it had available to meet the Minnesota Company's forecasted design day requirements of 860,542⁵ Dth.

In docket 20-633, Xcel is required in accordance with Minn. Rules, part 7825.2910, subp. 2, to file petitions for any change in demand, as follows:

Gas utilities shall file for a change in demand to increase or decrease demand, to redistribute demand percentages among classes, or to exchange one form of demand for another. A filing must contain:

- A. a description of the factors contributing to the need for changing demand;
- B. the utility's design-day demand by customer class and the change in design-day demand, if any, necessitating the demand revision;
- C. a summary of the levels of winter versus summer usage for all customer classes; and

¹ Attachment A contains pages 37 through 41 of Xcel Energy's April 9, Initial Report n Docket G-999/CI-21-135.

<https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={3058B878-0000-C010-BFD0-BBC48B62575B}&documentTitle=20214-172734-01>

² Xcel Supplemental Filing, Revised Attachment 2, Schedule 1, p. 1. (October 29, 2020) (LNG 156,000 + LP 90,000 = 246,000).

³ Id. p. 1 and p. 3.

⁴ Includes Minnesota and North Dakota

⁵ Xcel Supplemental Filing, Revised Attachment 1, Schedule 3, p. 1; Revised Attachment 2, Schedule 1, p. 3.

- D. a description of design-day gas supply from all sources under the new level, allocation, or form of demand.

In its Petition in docket 20-633, Xcel advocated for a reduction in its reserve margin, stating:

this reserve margin is appropriate, given the need to balance the uncertainty of: (a) experiencing DD conditions; (b) actual consumer demand during DD conditions; and (c) the need to protect against the potential loss of a source of firm natural gas supply.

We add firm resources to meet projected firm customer demand and plan to maintain a reserve margin as close as practicable to either the capability of the largest pump at Westcott used to vaporize LNG or to the capability of either of the St. Paul metro propane-air peak shaving plants. Capacity decisions are based on projected demand, and the most economic method of adding capacity often involves adding increments that do not precisely match expected changes in demand. The reserve margin ensures reliability for our firm natural gas customers in Minnesota. The proposed 2020-2021 heating season DD reserve margin for Minnesota State is 42,439 Dth/day or 5.7 percent.⁶

The disclosure regarding the unavailability of the peak shaving plants starting in January 2021 raises the question whether there should be any modification to the demand entitlements requested in docket 20-633. Specifically, the reserve margin amount Xcel is requesting appears to be based on covering the potential loss of the largest pump at Westcott or the two propane-air peak shaving plants. In hindsight, all three of these facilities were not available.

III. Staff Analysis

Staff believes this information should have been disclosed in this docket as this matter was still pending when Xcel realized its peak shaving facilities were not operational in January 2021. Fortunately, Xcel has reported that it did not have to curtail any of its firm customers during the cold weather event of February 2021. Staff believes that at this point, the unavailability of the gas associated with Xcel's peak shaving facilities may have more to do with the investigation docket and Xcel's next demand entitlement filing, for the 2021-2022 heating season. It is not clear at this point, what effect if any this has on the decision alternatives in this docket.

Based on Xcel's filing, it proposed a reserve margin based in part on the possibility that one of its peak shaving facilities would be unavailable, and in fact all three were unavailable. However, it is not readily apparent how the lack of availability of the peak shaving plants should

⁶ Xcel Petition, Attachment 1, pp. 8-9

<https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={40F9A673-0000-C61F-9AD7-2F17A911D1FD}&documentTitle=20207-165440-01>

affect the approval of the demand entitlements on the interstate pipelines. Xcel's peak shaving plants are supplemental to the capacity Xcel has reserved on the interstate pipelines. Xcel's cost of maintaining these facilities is not part of this demand entitlement filing nor is the question of whether it would have been prudent for Xcel to use the gas in its peak shaving facilities in February 2021 if they had been available. Xcel's demand entitlement petition was filed on July 21, 2020, requesting an effective date of November 1, 2020. So it is only with hindsight that the design-day projections and reserve margin are being evaluated. On this basis, it appears it may be appropriate to approve the petition. However, if the Commission is uncomfortable going forward at this time, the Commission could request additional comments and responses in this docket.

IV. Decision Options

Initial Briefing Paper - Decision Options

1. Approve Xcel Energy's proposed level of demand entitlements as amended by its Supplemental Filing; and [Department, Xcel]
2. Allow Xcel Energy to recover associated demand costs through the monthly Purchased Gas Adjustment effective November 1, 2020. [Department, Xcel]
3. Require Xcel Energy to submit a compliance filing within 10 days of the Commission's Order that explains and confirms how it handled the pipeline refund in January 2021 in accordance with the Commission supplier refund rules. [Staff additional decision option.]

Supplemental Briefing Paper - Additional Decision Options

4. Defer any action on this docket and issue a notice and request for comment for the Company and parties to address whether and to what extent the Commission should consider the lack of availability of its peak shaving plants from January 2021 in its consideration of the Petition in docket 20-633.
5. In its next Demand Entitlement filing, the Company is directed to explain how it evaluated, tested and repaired its peak shaving plants (Wescott, Sibley and Maplewood) to ensure their availability for the 2021-22 heating season.

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By February 18, the spot market had largely returned to its pre-spike pricing.

D. Capacity Planning

In addition to procuring sufficient gas supply to meet our customers' needs, the Company also plans for and obtains sufficient firm pipeline capacity to provide gas to our customers on peak or "Design Days." Although Winter Storm Uri caused extended low temperatures throughout our service territory, we never approached Design Day conditions, and we maintained sufficient pipeline capacity to provide gas to our customers.

As discussed above, the primary way we obtain sufficient capacity to provide gas to our LDC customers is through purchases of pipeline capacity from inter- and intrastate pipelines like Northern and Viking. There are, however, other tools we use to meet our capacity needs, including peaking plants and our "Capacity Utilization Plan," which we discuss below.

1. Peaking Plants

In addition to simply purchasing capacity on a pipeline, one of the primary ways the Company maintains sufficient capacity to serve our customers is through our liquid natural gas (LNG) and propane peaking plants at Wescott, Sibley, and Maplewood. These plants are used to ensure we can meet our customer's needs as we approach Design Day conditions. Although such conditions do not regularly occur, the peaking plants are still important to design day plans. Because these plants generally are available to provide gas to customers during peak conditions, the Company is able to avoid incremental pipeline capacity purchases to meet the same need.

As discussed below, these plants were unavailable during the February event. However, because the Company had adequate other resources to meet its pipeline capacity needs, this unavailability did not impact our ability to provide reliable service to our customers.

a. Wescott

The largest of the Company's three gas utility peaking plants is the Wescott Liquid Natural Gas (LNG) Peaking Plant, located in Inver Grove Heights, which was built in the 1970s. The peaking plant can store approximately 2,145,000 Dth of LNG in two storage tanks. Essentially, the Company purchases natural gas to store at Wescott

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during the non-heating season when gas supply is readily available. Throughout the spring and fall shoulder months,²⁶ the Company liquefies purchased natural gas in a process that reduces its temperature to approximately -260 degrees Fahrenheit. That is because the volume of natural gas stored in its liquid form is hundreds of times smaller than natural gas in a gaseous state. The natural gas is then stored in a liquefied state until it is vaporized and injected back into the system. The vaporization process heats the pressurized natural gas back up to a temperature where it returns to its gaseous state.

This means that the Wescott peaking plant has two separate and opposite processes—liquefying the natural gas by cooling it to a liquid form for storage in the tank and then vaporizing the natural gas by heating it, turning it back into a vapor state, when leaving the tank. Shifting between these two processes is not simply a “flip of the switch.” Instead, the peaking plant focuses solely on the process of liquefaction in the non-heating season. Then early in the winter, the peaking plant “turns over” to prepare for and implement the vaporization process. This aspect of the peaking plant is important in understanding its use for natural gas planning purposes. Because the peaking plant cannot readily switch from liquefaction to vaporization, the amount of natural gas in storage at the beginning of the heating season is the maximum the Company will have in LNG storage for the heating season. Accordingly, the Company has historically used the liquified inventory conservatively.

The technical maximum single day withdrawal capacity of Wescott is 156,000 Dth. The daily withdrawal capacity is primarily limited by the downstream pipeline system which serves the St. Paul metro area. Wescott is utilized for two primary purposes: peak shaving to supplement pipeline capacity on peak day conditions and when intra-day gas demand is higher than anticipated and no other gas supply is immediately available. While there are a variety of reasons that the Company uses the peaking plant, the practical reality is that these types of circumstances do not arise very often. The peaking plant is tested and prepared for vaporization each year, but Wescott has not vaporized and injected gas into the system since March 2019.²⁷

The Company did not have a need to vaporize LNG at Wescott in November and December 2020 because the weather was generally warm and the supply requirements

²⁶ The Company does less liquefaction in the summer months because the outside air temperature makes the liquefaction process less efficient.

²⁷ Each month, Wescott injects a modest amount of natural gas into the system as a result of vaporization that occurs naturally as the tanks heat up throughout the month. This vaporization occurs without the gas going through the vaporization equipment and instead get into the natural gas system through separate piping built to handle the boil off and inject it into the system. If this natural gas were not injected into the natural gas system, it would need to be vented into the atmosphere. We projected these monthly quantities as 21,000 Dths.

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of our customers were provided through upstream interstate pipelines. In November and December, the Company began testing certain components of the vaporization equipment in preparation for winter operations. The peaking plant completed liquefaction and was “turned over” to the vaporization process in late December 2020. We tested the vaporization process on both December 31, 2020 and again on January 4, 2021. During those tests, some vaporization equipment exceeded design pressure causing safety relief valves to lift and resulted in an unplanned release of natural gas to the atmosphere. To ensure the safety of our employees and the community, we ceased operations until we could determine the cause, including a review by a third party engineering firm, Campos EPC, and reported the releases to the National Response Center and Minnesota Office of Pipeline Safety (MNOPS).

Beginning on January 6, 2021, the Company investigated the December 31 and January 4 events with internal operations personnel and third-party engineering consultants. The investigation reviewed the operational history of the peaking plant, including the condition of the vaporization system on the dates of the unplanned gas releases. The analysis of the events determined that a low temperature alarm was triggered on the outlet of the plant which results in the plant’s controls systems closing the inlet valve to the LNG vaporizer. While the valve was closing, the LNG pumps continued to run momentarily resulting in a buildup of pressure in this pipeline and then the relief of the pressure through the safety valves. Internal and external personnel ultimately determined the primary root cause of the safety valves lifting and resulting releases was attributed to a modification made approximately twenty years ago to the LNG product pumps. Although we had hoped to return the peaking plant to service this heating season when the review began, as the review progressed, the Company determined that the peaking plant could not be operated safely until investments were made to appropriately modify the vaporization process to permit safe operation.

To return the plant to safe and reliable service, the Company will need to install variable frequency drive units on the LNG pumps which can limit their output, install additional process safety valves and relief containment systems, make modifications to the electronic controls of the equipment, and finally make improvements to safety systems such as additional gas detection equipment. The final design and engineering of all of the identified projects has not yet been completed. In the next several weeks, however, internal and external personnel will work to develop more detailed project scopes, timelines and estimates. The Company anticipates investments will be made over the next three years and have been prioritized to ensure that Wescott will be available to vaporize LNG for the 2021-22 natural gas heating season and beyond. The Company commits to provide an update on this construction work in its 2021-22 CD Entitlements filing, which will be filed this summer, and of course these costs

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would be thoroughly reviewed in the course of the Company's next natural gas rate proceeding.

Wescott is currently non-operational. We are working closely with MNOPS to ensure the safety of our employees, customers and the environment before we will resume operations at Wescott. As described below, we also decided to review the vaporization processes at our other two peaking plants, Sibley and Maplewood.

b. Sibley and Maplewood

The Company's other two peaking facilities store propane: the Sibley Propane Air Peaking Plant in Mendota and the Maplewood Propane Air Peaking Plant in Maplewood. Sibley can store approximately 114,000 Dth equivalent of propane, with a technical maximum single day withdrawal capacity is 46,000 Dth. Maplewood can store approximately 124,000 Dth equivalent of propane, with a technical maximum single day withdrawal capacity of 44,000 Dth. Once propane is mixed with air, it can be injected into the natural gas system.

Propane is delivered via truck to Sibley and Maplewood in its liquid state, and therefore, these peaking plants do not need to undergo a liquefaction process to store the fuel on site. This is an important distinction from the Wescott plant because the storage tanks can be refilled with propane throughout the year. However, trucking propane to refill Sibley and Maplewood customarily takes weeks and is subject to the market price of propane.

Similar to Wescott, the Sibley and Maplewood peaking plants are mainly used to support gas supply requirements during Design Day conditions. Supply from Sibley is also utilized for the provision of Limited Firm Service. Like Wescott, these peaking plants are generally reserved for peak shaving to offset pipeline capacity need on peak day conditions. While these two peaking plants are tested and prepared for vaporization each year, neither one has vaporized and injected gas into the system since February 2019.

While propane does not undergo a liquefaction process like LNG, it does go through a similar vaporization process, wherein the propane is blended with air and injected into our natural gas system. As discussed above, given the discovery of safety issues at Wescott, we ceased operations at these two peaking plants so that we could review the vaporization processes at both Sibley and Maplewood, likewise engaging Campos EPC to assist with that review. An asset health and safety assessment was performed by Campos EPC to review the status of each system, identify asset integrity, and operability of the fundamental systems at Sibley and Maplewood. Again, although we

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had hoped to return the peaking plants to service yet this heating season when the review began, as the review progressed, we similarly determined that additional investments needed to be made at Sibley and Maplewood before we can safely operate them. The primary finding of the assessment was that due to the age of the facilities, many components in the vaporization system will require replacement due to age, including valves, vaporizers, the boiler systems and modifications to the electronic controls systems for the equipment. Additionally, the Company plans to make similar modifications to the safety systems at the Sibley and Maplewood peaking plants. Currently, both Sibley and Maplewood are offline, meaning the vaporization system has been isolated and purged of product. A Hazard and Operability Analysis (HAZOP) and Layer of Protection Analysis (LOPA) of these plants is planned for the second quarter of 2021 and the results of these studies will be used to inform the final project scopes.

Similar to Wescott, the Company has not yet completed final design or engineering. The Company anticipates that investments will be made this year so that the peaking plants will be available to vaporize natural gas for the 2021-22 natural gas heating season. As mentioned above, the Company will provide an update on this construction work in its 2021-22 CD Entitlements filing and these costs would be thoroughly reviewed in the course of the Company's next natural gas rate proceeding.

2. Capacity Utilization Plan

In addition to traditional capacity resources, like pipeline capacity contracts and peaking plants, as the only combination gas and electric utility in the state of Minnesota, the Company has the unique opportunity to share capacity resources between both our electric generation and LDC needs. This means that, in appropriate circumstances, the Company can use pipeline capacity normally reserved for its gas fired electric generating units including the Black Dog, High Bridge and Riverside combined cycle facilities (in addition to six other plants that have dual fuel units, which can run on either natural gas or burn fuel oil), for LDC customers.

The Company maintains distinct natural gas transportation capacity and storage contracts for NSP Gas²⁸ and NSP Generation²⁹ to accurately allocate costs to respective customers. But because our natural gas business and electric business have differing seasonal peaks, the Company has in place a Capacity Utilization Plan, for

²⁸ NSP Gas includes natural gas transportation capacity and storage contracts for the gas distribution functions in Minnesota and North Dakota.

²⁹ NSP Generation includes natural gas transportation capacity and storage contracts for the electric portfolios in Minnesota, North Dakota, Wisconsin, and South Dakota.