PEAK-HOUR DEMAND AND RELIABILITY

Peak-Hour Requirements

Most customers do not use natural gas evenly throughout the day. Usage rates are typically higher in the morning hours. The apex of these periodic increases in instantaneous flow is the peak-hour demand. Hourly demand exceeds the average daily demand for a few hours each day (see Figure 8.1). As the Company's customer base and associated demand has grown, the Company has seen a corresponding increase in peak-hour demand. It is important to note that capacity is sold on a daily basis, not hourly.

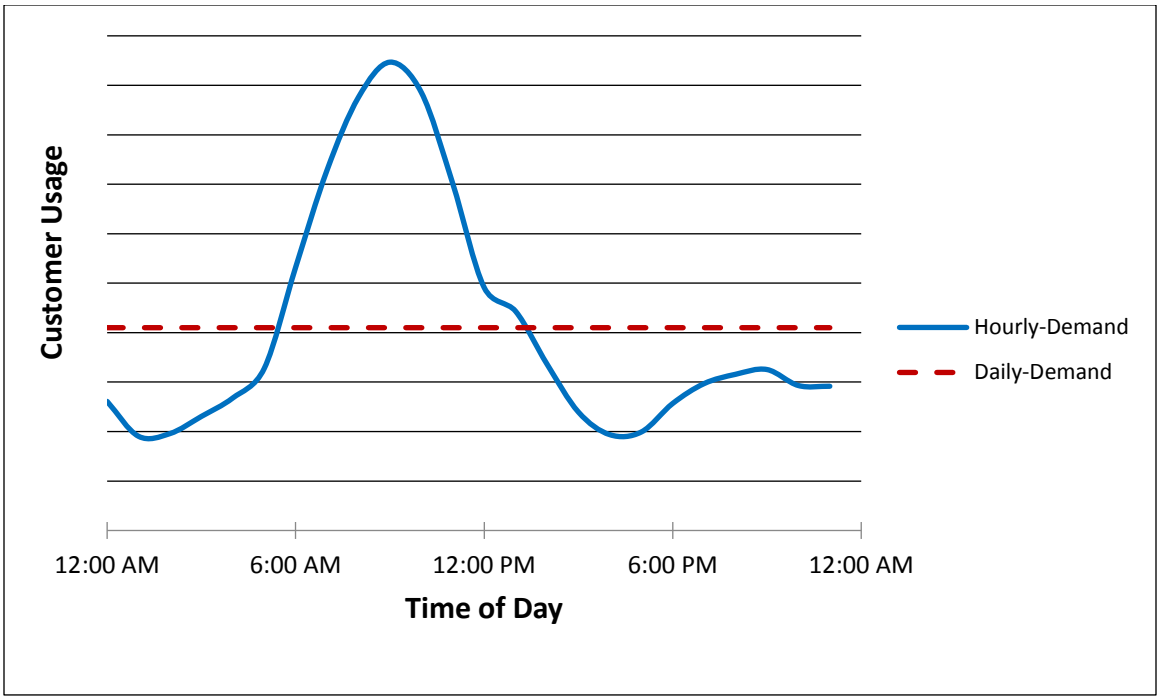

Figure 8.1: Hourly vs. Daily Demand

On December 17, 2015 and in the 2016-2017 and 2017-2018 IRP Workshops, the Company provided updates to the Utah Commission on the impact of peak-hourly demand on its system and the resources available to meet this demand. As indicated later in this section, the Company has taken steps to resolve peak-hour issues.

As shown in Figure 8.2, the Company forecasts that projected peak-hour demand across the system will materially exceed the Company's total firm capacity on a peak day for each of the next ten heating seasons. This excess peak-hour demand is forecasted to increase from 340,000 Dth/day during the 2017-2018 heating season to 390,000 Dth/day during the 2025-2026 heating season.

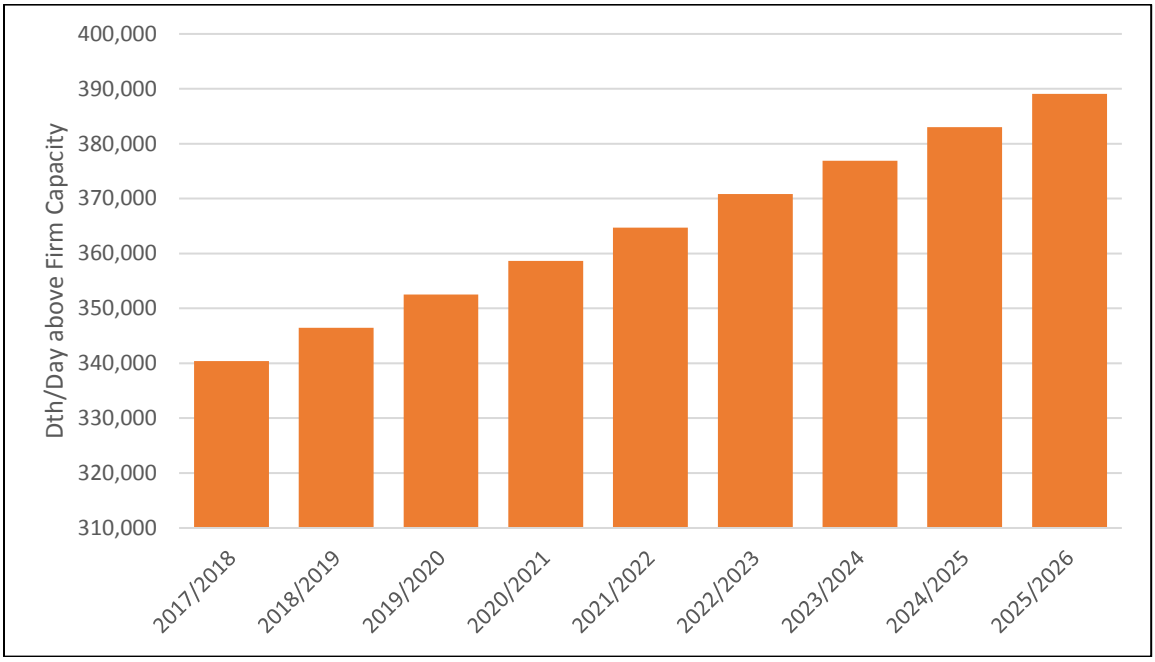

Figure 8.2: Peak-Hour Demand Requirements above Firm Capacity

Supply Reliability

Over the past few years, the Company has encountered unexpected supply shortfalls due to upstream disruptions including well freeze-offs and plant outages. Three examples of these events were on December 5, 2013, December 31, 2014, and January 6, 2017. These events resulted in intraday supply reductions and reduced supply availability. While existing contingency plans were successful in managing these events, if similar supply disruptions occurred on a peak day or during a prolonged period of cold weather, the Company would not be able to maintain reliable service to its customers. As a result, the Company continues to evaluate diverse resources that provide enhanced supply flexibility and reliability in the event of supply reductions.

Short-Term Remedies

As discussed in the 2016-2017 IRP, the Company evaluated several near-term options to meet the peak-hour demand requirements. As a result, for the 2016-2017 heating season, the Company planned to purchase excess supplies to match the peak-hour demand on a peak day.

In order to ensure the availability of this supply, the Company contracted for additional transportation capacity to access locations with available supply and entered into peaking contracts for the gas supplies. The Company contracted for 27,625 Dth/D of additional capacity on Kern River from October 1, 2016 and March 31, 2017 and 40,000 Dth/D of additional capacity on Dominion Energy Questar Pipeline from November 15, 2016 through February 14, 2017. The Company also planned to transport purchases at Goshen to the Company's Payson gate station using interruptible backhaul capacity on Dominion Energy Questar Pipeline.

This was a short-term remedy based on the availability of options for the 2016-2017 heating season; however, prudent long-term planning requires the use of a more diverse portfolio of resources to adequately meet peak-hour requirements and provide reliable supply for customers. The Company continues to pursue the options discussed in the 2016-2017 IRP to develop this diverse portfolio.

Long-Term Remedies

The Company considered the following potential remedies for meeting future peak-hour demand requirements (separately or in combination): 1) implementing demand response programs, 2) contracting for additional firm upstream transportation capacity and purchasing excess supply to meet peak demand, 3) additional off-system storage, 4) upgrading facilities, 5) contracting for upstream hourly firm peaking services, and 6) building on-system storage.

1) Demand Response

The Company conducted analysis of demand-response solutions to peak-hour requirements. Recent experience during supply curtailments indicate that many customers are unwilling or unable to reduce usage when requested, even when facing large financial penalties. Accordingly, the Company has not considered demand response as viable part of the solution to meet peak-hour demand requirements. However, the Company will continue to monitor whether demand response options can be part of a solution at some point.

2) Excess Firm Upstream Transportation Capacity and Supply Purchases

The Company analyzed the impact of acquiring upstream supply and corresponding additional firm upstream transportation capacity in order to meet the peak-hour demands. Contracting for firm upstream capacity provides access to locations which generally have supply available to purchase. However, during periods of extreme cold and/or high demand when prices are at their highest, there is no guarantee the supply will be available at the volume necessary to meet peak-hour demand requirements. While transportation capacity is an essential part of meeting peak-hour demand requirements, exclusive reliance on purchasing excess supply and upstream transportation to meet peak-hour demand does not reduce the customer's exposure to high prices and risk of supply shortfalls on high-demand days.

3) Excess Firm Upstream Transportation Capacity and Additional Off-system Storage

As discussed in the Gathering, Transportation, and Storage section of this report, the Company has contracts for off-system storage and corresponding firm transportation at Clay Basin, the Aquifers and Ryckman at levels that currently meet peak-day demand. While these resources are very valuable in meeting daily demand swings, they are not the best option for meeting peak-hour demand. Off-system storage is reliant on the nomination cycles of the upstream pipelines and therefore do not flow on an hourly basis. Additionally,

if the upstream pipeline allocates storage or transportation then flexibility to obtain additional storage is diminished.

4) Facility Improvements

As described in the System Capabilities and Constraints section of this report, the gate stations that serve the Wasatch Front are near capacity. This limits the flexibility available to adjust supply sources based on need or prices. In order to provide additional flexibility the Company is working toward increasing gate station capacity to the Company's system with improvements at the Hyrum gate station and by constructing a new North Salt Lake gate station. As discussed in Gathering, Transportation, and Storage section of this report, the upgrades at the Hyrum station will be in service for the 2019-2020 heating season in coordination with the replacement of FL 23. The new North Salt Lake gate station will also be in service for the 2019-2020 heating season.

5) Upstream Hourly Firm Peaking Services

The American Gas Association has taken an active role on behalf of local distribution companies in FERC rulemaking dockets as a part of a larger effort to improve reliability nationwide.[76] Meanwhile, to further reliability in the industry, FERC has approved rate schedules that allow interstate natural gas pipeline companies the ability to offer enhanced services, such as hourly peaking services or hourly firm transportation, to provide shippers the ability to contract for services over an hourly or peak period during the day as opposed to standard firm services which contract per day and not per hour.

On February 26, 2016, the Company sent out a request for proposals (RFP). The RFP sought proposals for services to meet peak-hour demand utilizing upstream pipelines. The Company proceeded with two of the three responses to this RFP for upstream hourly services to meet the hourly demand swings. These services provide operational flexibility and should also be included as part of a diverse portfolio of resources used to ensure reliable supply for customers.

The Company contracted for Firm Peaking Transportation Service with Kern River to meet hourly demand swings during the 2016-2017 heating season. This was a seasonal contract for 30,000 Dth/D of hourly Firm Peaking Transportation Service from Goshen to Hunter Park. The 30,000 Dth/D would provide 5,000 Dth/h for up to 6 hours. This is the equivalent of 120,000 Dth/D for those 6 hours. The contract for this service had a term of December 1, 2016 through February 28, 2017. On May 1, 2017 the Company signed a Precedent Agreement to contract for 25,000 Dth/D of hourly Firm Peaking Transportation Service from Goshen to Hunter Park for the next three heating seasons. This is the equivalent of 100,000 Dth/D during the peak 6-hr period.

For the 2017-2018 heating season, the Company has also entered into a Precedent Agreement with the Company Questar Pipeline for 250,000 Dth/D of hourly Firm Peaking

[76] Comments of the American Gas Association, FERC Docket No. RM14-2-000 (Nov. 28, 2014).

Service, subject to FERC approval. This service would provide required peak-hour services for locations on the Company's system served by Dominion Energy Questar Pipeline including many that are only served by Dominion Energy Questar Pipeline. Dominion Energy Questar Pipeline must obtain FERC approval to add hourly Firm Peaking Service to its FERC Gas Tariff.

6) On-System Storage

The Company's engineering analysis concluded that owning and operating an on-system storage facility is a critical component of the long-term solution to the peak-hour demand issue. This solution minimizes customer risk by providing a diverse source of supply located near the demand center. This alternate source of supply would provide additional operational advantages, including the ability to replace supply shortfalls that often occur during periods of high demand, thereby enhancing system flexibility and supply reliability.

Benefits of an on-system facility:

- Reduction in upstream supply, gathering, and processing risks
- Immediate access to gas supply given the proximity downstream of the city gate
- Greater operational responsiveness to system/customer needs because withdrawals are not subject to nomination requirements
- Designed so that it can be expanded as demand grows in the future

LNG has been used for more than 40 years by local distribution companies (LDCs) nationwide and is a safe and reliable option for on-system storage. Many LDCs throughout the country use on-system LNG facilities for meeting peak-hour and supply reliability needs. This includes many LDCs that serve similar geographic areas and number of customers. Since there are no known underground storage options available on the Company's distribution system, an LNG facility is the preferred solution to provide on-system storage downstream of the city gate.

Over the past few years, the Company evaluated the benefits of an on-system LNG facility. In 2014, the Company contracted with a consultant, CH-IV International, to perform a conceptual cost study of an on-system facility. On February 26, 2016, the Company sent out an RFP for on-system storage. The Company selected HDR, Inc. (HDR) to complete a preliminary front end engineering design (Pre-FEED) study and initial site selection. HDR completed this study and the Company plans to have them also commence a FEED study in 2017. The process of building an LNG facility typically takes 4-5 years and includes regulatory approval; permitting; FEED; preparation of an engineering, procurement, and construction (EPC) RFP; contracting; and construction.

An on-system LNG facility is a critical component of a long-term solution to meet peak-hour demand and reliability requirements and should be included as part of a portfolio

of resources used to meet peak-hour requirements and ensure diverse supply for customers. Therefore, the Company plans to take necessary steps to complete this process in the near future.