

Texas Pipeline Industry Driven by Free-market Principles to Efficiently Deliver Vital Hydrocarbons in All Weather Conditions; Pipeline Operations Were Not Significantly Affected by Freezing Temperatures During Winter Storm Uri

In extreme weather events – whether hot or cold – and every day of the year, the Texas pipeline industry is prepared to safely and efficiently deliver the hydrocarbons Americans rely on every day, such as crude oil, petroleum products and natural gas.

But what happens when weather events, such as Winter Storm Uri in 2021, result in extended power blackouts? It's important to learn from these events and to take preventative measures to ensure that it does not happen again. It is equally important to recognize some basic truths surrounding what occurred and, in general, how various parts of our Texas energy system perform.

Pipelines are part of the midstream sector of the oil and gas industry and are responsible for the gathering and transporting of natural gas from the well-head (upstream) to our homes and businesses – including power generators (downstream). Midstream operations also include the processing and treatment of the product, removing water and waste, and compressing it to get it ready for transmission to various markets downstream.

Texas pipelines are market-driven

Texas intrastate lines, in particular, operate within a competitive market where the economic principles of supply and demand dictate costs of service, inform contract terms and determine the build out of new infrastructure. This competitive market design ensures that Texans benefit from an efficient, cost-efficient system that delivers some of the lowest energy prices in the nation.

Texas has the largest pipeline infrastructure in the U.S., representing about 1/6 of the country's total pipeline mileage. Texas' pipelines are divided into the categories of natural gas and LP-gas distribution lines, hazardous liquid and natural gas transmission lines, hazardous liquid and natural gas regulated gathering lines, intrastate production and gathering lines leaving a lease and interstate lines. Texas currently has 437,747 intrastate miles of pipeline (within the state) and 488,564 total miles of pipeline (both within the state and interstate, i.e. crossing into other states).

Firm vs. interruptible service

Pipeline transportation prices are set by negotiated contracts and the price of natural gas is determined by the global market. Pipeline customers enter into contracts for both transportation

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and storage services, as well as gas supply, on the basis of either “firm” or “interruptible” service. Firm service is the highest quality of service offered, as it takes priority over interruptible service. Customers choose to pay a premium for this service in order to receive that priority.

In contrast, interruptible service is the least reliable form of service that can be contracted for. In exchange for paying a lower price for service, these customers choose to incur the risk of being “bumped” with little notice in order for the pipeline to accommodate higher priority customers.

Why does this matter?

During Winter Storm Uri, customers who had arranged for firm service received their gas, while customers who chose interruptible transportation service and/or interruptible supply were sometimes left to purchase more expensive, spot-market priced natural gas when demand was high and supply was low.

This volatility underscores the importance of obtaining both firm supply and firm transport service. To help hedge against these risks and anticipate Winter Storm Uri, pipeline companies engaged in a preparedness best practice known as “line packing” before the freeze, where operators “packed” a pipe to prepare for the coming large draw of gas supply (or to accommodate for a loss of supply upstream). Line packing is also important for the ability to maintain the pressures on a natural gas pipeline, which is paramount because inadequate pressure compromises the ability of the entire system to deliver gas to its customers.

A second method of hedging against the volatility of natural gas prices, as well as maintaining pressure on the line, is the utilization of natural gas storage. Natural gas supplies held in storage play a vital role in meeting peak demand, as it helps to meet seasonal and sudden increases in demand, which might not otherwise be met with domestic production.

Downstream customers who contracted for natural gas storage in advance of the storm were able to purchase gas at a lower cost and store it until it was needed, avoiding having to find gas on the spot market. In fact, packed pipelines and storage facilities played a crucial role during Uri when demand far exceeded supply and additional gas was needed to maintain operating pressure. This ensured that firm service customers received the gas they contracted for.

Midstream operations that received electricity and gas supply sufficient to keep pipeline pressure up during the event continued operations as planned, which is why vital natural gas was delivered to millions of Texans in their homes during the storm. This is supported by the [FERC - NERC - Regional Entity Staff Report: The February 2021 Cold Weather Outages in Texas and the South Central United States](#).

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The predominant challenge for many producers and transporters of natural gas during Uri was the loss of electric power, which was exacerbated by freezing compressor lines and valves, remote production facilities that could not be accessed due to icy road conditions, power and telecommunication systems that went down and a variety of third-party stations, such as disposal wells along the supply chain that were disrupted.

Winterization was a factor

Beyond not securing firm contracts, there were issues downstream as well, such as the lack of winterizing equipment and facilities. The FERC NERC report stated on page 17: “Despite multiple prior recommendations by FERC and NERC, as well as annual reminders via Regional Entity workshops, that generating units take actions to prepare for the winter (and providing detailed suggestions for winterization), 49 generating units in SPP (15 percent, 1,944 MW of nameplate capacity), 26 in ERCOT (7 percent, 3,675 MW), and three units in MISO South (four percent, 854 MW), still did not have any winterization plans, and 81 percent of the freeze-related generating unit outages occurred at temperatures above the unit’s stated ambient design temperature. Generating units that experienced freeze-related outages above the unit’s stated ambient design temperature represented about 63,000 MW of nameplate capacity.”

And according to *The Washington Post’s* [March 6, 2021 article](#), which reported on a similar but not as extreme winter event 10 years earlier: “In all, during the 2011 freeze, equipment failures affected 241 plants owned by 41 companies, leading to rolling blackouts that took power offline for hours at a time. The rolling outages led to widespread calls for power generators to do a better job preparing their equipment for winter weather.”

The Washington Post continues, referring to the 2021 storm: “The corporate and municipal owners of more than 30 power-generation plants in Texas appear to have failed to adequately heed a decade of warnings to better prepare for deadly winter weather, contributing to their malfunctions or shutdowns during last month’s historic winter freeze that led to statewide power outages and a humanitarian crisis.”

Concluded *The Post*: “Facilities owned by Fortune 500 energy giants NRG, Calpine Corporation and Vistra Corporation, all headquartered in Texas, and the Chicago-based Exelon, experienced shutdowns during last month’s winter storm, as well as during the state’s last historic cold snap a decade ago.”

Following the 2011 storm, Texas pipeline companies on their own accord invested in significant winterization to their infrastructure to enhance resilience to severe cold weather. According to the FERC NERC report, pipelines “were not significantly affected by cold weather and freezing conditions” during the 2021 storm.

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Contrary to some reports following the storm, pipelines DO NOT FREEZE. That's because pipes are buried underground and are naturally insulated. In addition, it would take a temperature of minus 260 degrees Fahrenheit to freeze natural gas.

Significant changes made to grid

To address many of the issues encompassing problems with all forms of energy to the grid, including natural gas, coal, nuclear, wind and solar, Texas legislators held several weeks' worth of hearings to address how the energy grid could be improved during extreme events. Consequently, SB 3 in 2021 created a massive new regulatory structure that helps ensure the integrity of the energy grid. More recently, during the last Legislative Session, lawmakers from both sides of the aisle filed hundreds of energy-related bills, resulting in further reforms to the grid.

These and other measures, including the extensive weatherization that pipeline companies took in 2011, are substantial improvements to an energy grid that arguably is one of the best in the nation for offering plentiful, affordable and reliable energy to its residents and businesses.

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