

REPORT ON
OUTAGES AND CURTAILMENTS
DURING THE SOUTHWEST
COLD WEATHER EVENT
OF FEBRUARY 1-5, 2011

Causes and Recommendations

Prepared by the Staffs of the
Federal Energy Regulatory Commission
and the
North American Electric
Reliability Corporation



AUGUST 2011

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generating unit. The failure to start of a gas-fired combustion turbine aggravated the situation, which continued until the afternoon of February 3. During this period, Sunflower was unable to meet its energy commitments to the SPP reserve sharing group. However, following declaration of the EEA 3, Sunflower obtained sufficient transmission service to purchase energy and was able to meet its own firm energy commitments, thereby avoiding the need to shed load.

In SPS’s case, its purchases over the Blackwater Tie (a connection between the Western and Eastern Interconnections) were lost between 9:00 AM and 10:00 AM on February 2, due to capacity emergencies in the Western Interconnection. SPS replaced this purchase with a 100 MW purchase from Public Service Company of Colorado, importing it over the Lamar Tie (another one of the connections between the Western and Eastern Interconnections). SPS ultimately increased this purchase to 210 MW, and was later also able to make limited purchases through the Blackwater Tie.

Notwithstanding SPS’s transactions over the ties, the majority of the purchases made by the energy-deficient utilities within SPP were made from other SPP entities. Thus, even if SPP had been separated from its neighbors by asynchronous ties, as is ERCOT, it probably would not have had to shed load during the February event. This suggests that the problems ERCOT experienced did not directly relate to its functionally separate interconnection status, but rather to the ability and preparedness of the generators within its footprint to operate as scheduled during the severe weather conditions.

B. Natural Gas

The extreme cold experienced in early February 2011, particularly on February 2 and February 3, caused widespread production declines. These reductions were typically the result of freeze-offs,¹⁷² mostly at wellheads but also in nearby processing plants. To a lesser extent, other equipment reliability issues contributed to the problems, both at the wellhead and at processing and treating facilities. The rolling power blackouts in ERCOT also played a role in the Fort Worth Basin, as did customer curtailments in the Permian Basin. These supply reductions had adverse effects all the way down the delivery chain.¹⁷³

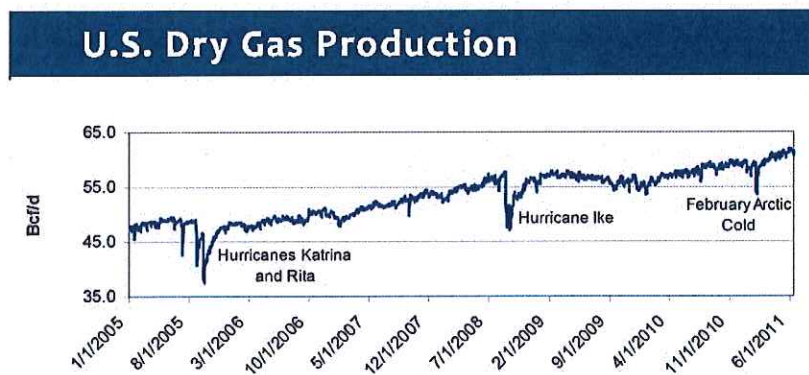
¹⁷² A “freeze-off,” as described earlier, occurs when water produced alongside the natural gas crystallizes or freezes, completely blocking off the flow and shutting down the well.

¹⁷³ Unless otherwise noted, the entity-specific data was obtained from materials submitted to the task force by producers, processing plants, pipelines, and LDCs.

This subsection summarizes the supply shortfalls resulting from production declines in the basins, discusses the resulting reduced gas volumes and pressures experienced by the pipelines, and ends with a detailed examination of the retail curtailments made by LDCs in the affected states of New Mexico, Arizona, Texas, and California.

Producing and Processing Facilities

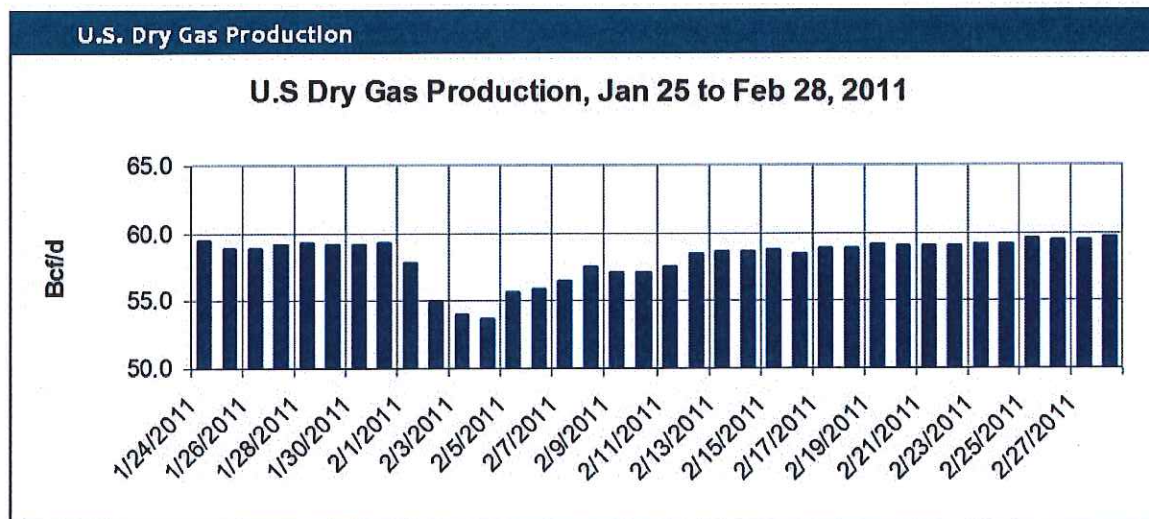
The reductions in supply experienced during the cold weather event were comparable in magnitude to production shut-ins during hurricanes. The following chart illustrates this point.



Source: Task Force chart based on Bentek data

Relative to average dry gas production of 59.22 Bcf per day on January 31, 2011, Bentek estimates that production in the first week of February declined by 5.55 Bcf per day, a reduction of 9.4 percent. The decline began on February 1 and reached its lowest level on February 4.¹⁷⁴

¹⁷⁴ Data is based on task force analyses using supply and demand history from Bentek.



Source: Task Force chart based on Bentek data

Of the 5.55 Bcf per day decline during the first week in February, 79 percent, or 4.36 Bcf per day, occurred in production basins in Texas and New Mexico (where production declined by 21 percent). Both the San Juan Basin in northern New Mexico and the Permian Basin in west Texas and southeastern New Mexico tend to experience production declines with low temperatures, and the February event was no exception. The declines in these basins, together with the large increases in demand, were almost exclusively responsible for the gas curtailments in Texas, New Mexico and Arizona.¹⁷⁵

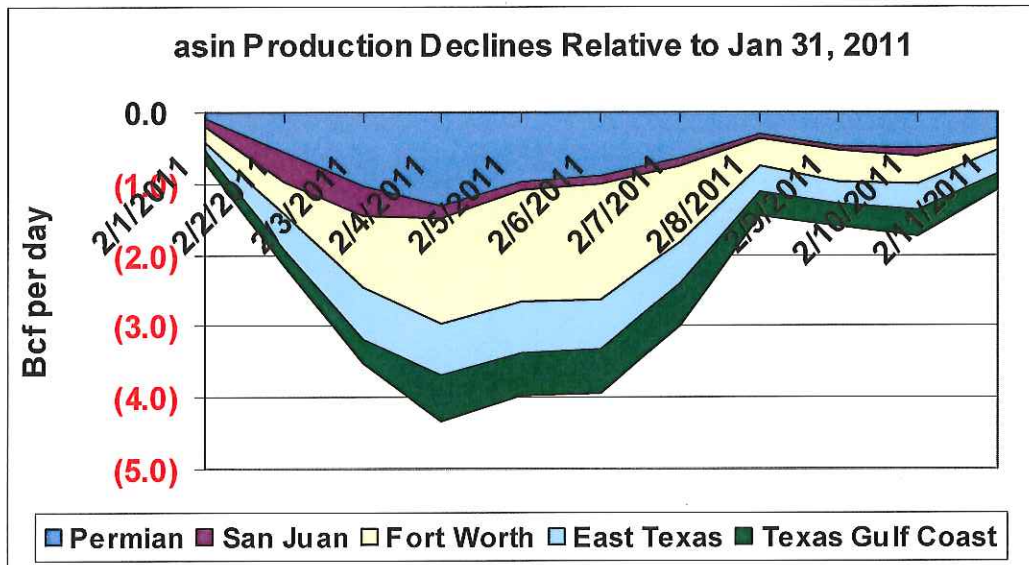
This weather event was so extreme that production freeze-offs were experienced not only in the San Juan and Permian Basins, but throughout Texas and as far south as the Gulf Coast. Based on scheduled pipeline receipts, the task force estimates that production in the Fort Worth Basin declined by 1.63 Bcf per day compared to the last week of January, 2011; East Texas Basin production declined by 0.72 Bcf per day; and Gulf Coast Basin production declined by 0.65 Bcf per day.¹⁷⁶ The shortfalls in these additional Texas basins, while not directly a cause of the natural gas curtailments, did contribute to fuel-related electric

¹⁷⁵ Production declined by 0.43 Bcf per day in the San Juan Basin and by 1.31 Bcf in the Permian Basin, based on task force analyses of Bentek supporting data, pipeline receipts and flow data from El Paso and Transwestern.

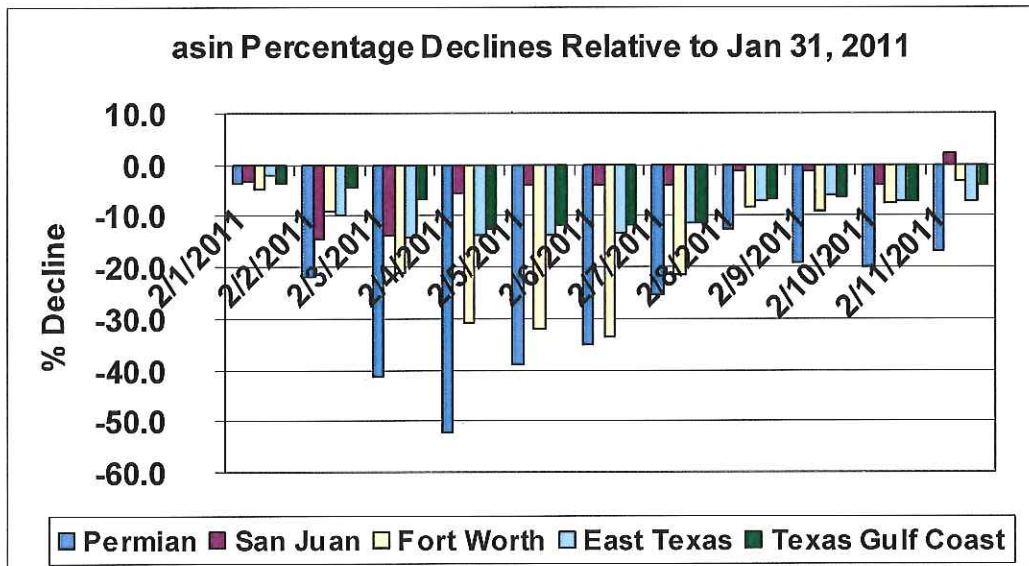
¹⁷⁶ Staff's analysis based on supporting data, display reports and data warehouse on file with Bentek (unpublished); see also *Market Alert: Deep Freeze Disrupts U.S. Gas, Power, Processing*, Bentek Energy LLC, Feb. 8, 2011, at 2-6; materials submitted to the task force by pipelines. Note that basin level production reductions may not be equal to the total February 4 reduction as not all basin level maximum reductions occurred on February 4.

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generation failures in ERCOT. The following charts demonstrate absolute and percentage declines by production basin.



Source: Task Force chart based on Entek data



Source: Task Force chart based on Entek data

The causes of these production declines are examined in detail in the following section of this report, entitled “Causes of the Outages and Supply Disruptions.”