Public Utility Commission of Texas

TO: Chairman Barry T. Smitherman
Commissioner Donna L. Nelson
Commissioner Kenneth W. Anderson, Jr.

FROM: Brian H. Lloyd
Executive Director

RE: Report on El Paso Electric Company Weather-Related Issues in February 2011

DATE: May 13, 2011

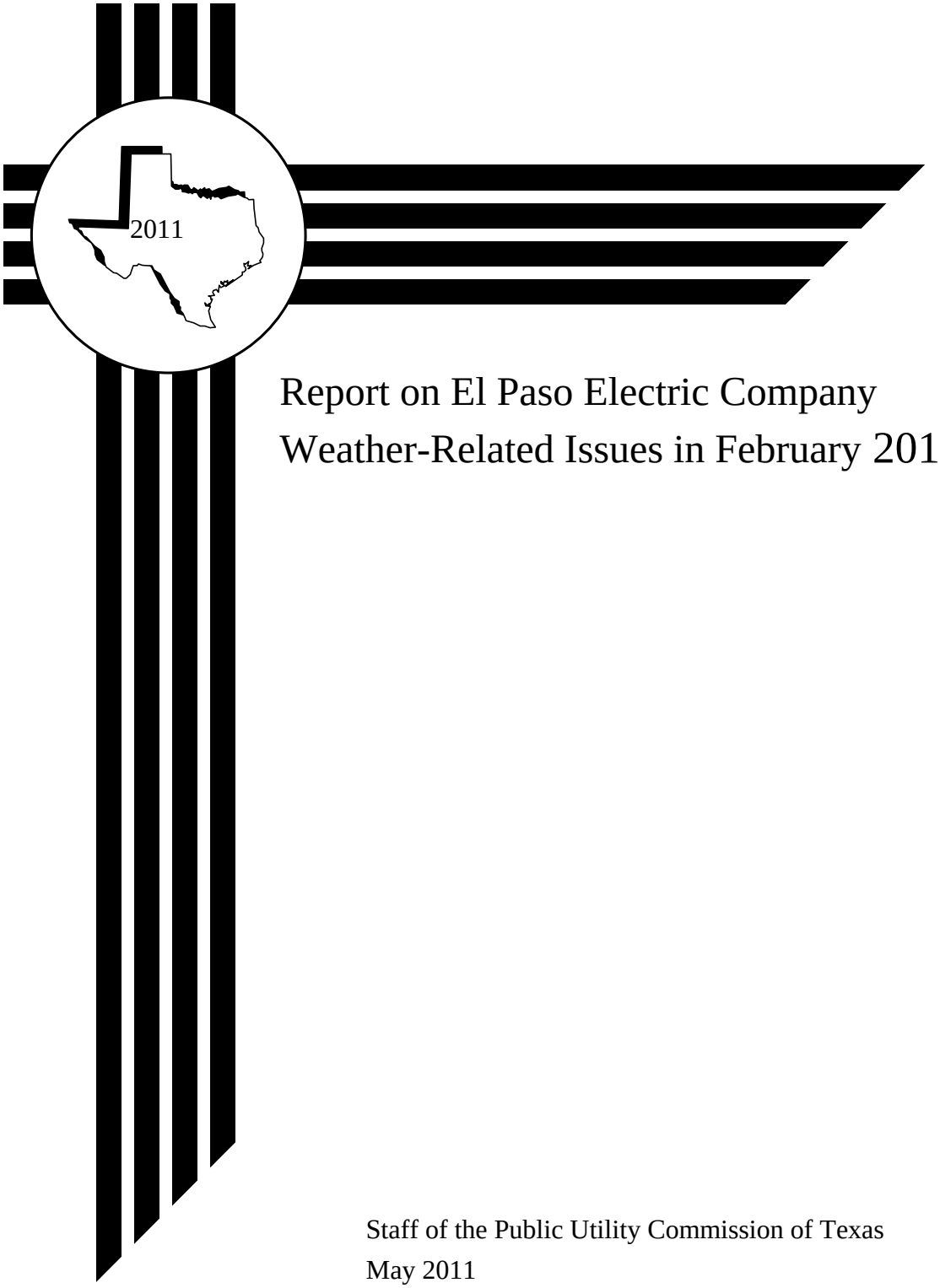
During February 2 – 5, 2011, Texas experienced extreme cold weather conditions leading to numerous outages for electric utilities across the state, including El Paso Electric Company (EPE). Attached is the EPE report on the weather-related issues experienced in February 2011. The report highlights the preparations taken by EPE, the actual events that impacted generation and water supplies, as well as EPE's response with controlled load shedding.

The report discusses the preparations taken by EPE prior to the cold weather as well as how these preparations were ultimately insufficient given that the majority of EPE's local generation resources were not designed for the unprecedented and sustained cold weather experienced in the El Paso region. Over the course of three days, EPE was required to implement periodic rolling blackouts that affected 110,000 customers in order to preserve the electrical system in El Paso.

At this time, Public Utility Commission of Texas (PUC) Staff has not identified violations of the Public Utility Regulatory Act (PURA) or the PUC's Substantive Rules. However, EPE is subject to the Commission's electric service quality rules. PUC Staff reviews compliance with and prosecutes violations of these requirements on a yearly basis. Any service quality violations resulting from the cold weather event are not part of the report. EPE's actions during and after the weather event could have an impact on future EPE retail rates which are subject to review and approval by the Commission. The Commission has the latitude in utility rate cases to approve or disallow expenses requested by the utility.

Several federal and state regulatory agencies are involved in ongoing inquiries regarding the cold weather event and EPE has several potential corrective action plans either under way or under study. The Western Electricity Coordinating Council (WECC) is the Regional Entity responsible for coordinating and promoting bulk electric system reliability for EPE's service territory. WECC and the North American Electric Reliability Council (NERC) are also conducting their own event analysis. This effort is being coordinated with an ongoing inquiry by the Federal Energy Regulatory Commission (FERC).

Please let me know if you have any questions.



Report on El Paso Electric Company Weather-Related Issues in February 2011

Staff of the Public Utility Commission of Texas

May 2011

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I. Executive Summary

During February 2 – 5, 2011 Texas experienced extreme cold weather conditions, leading to numerous outages for electric utilities across the state, including El Paso Electric Company (EPE). In order to ensure that the facilities and emergency procedures for EPE are up to appropriate standards, the Public Utility Commission of Texas (PUC) initiated an inquiry into the cold weather event in the EPE area. To facilitate its inquiry, PUC staff analyzed responses to numerous Requests for Information that were sent to EPE, including a *Report on Weather Event* prepared by EPE. PUC staff also met with EPE staff in person to discuss the event. The findings of the inquiry are contained in this report. PUC staff will also continue to monitor ongoing analyses being performed by EPE and various regulatory authorities, and evaluate the results and any resulting corrective action plans.

On February 2, 2011, EPE lost a large part of its local electric generation due to equipment failures caused by the arctic cold front that dropped temperatures to single digits for an extended period of time. This cold front significantly impacted EPE's ability to provide electric service to all of its customers. As a result of the significant generation shortage, EPE was forced to shed load (temporarily cut off electric service to some users) to maintain system stability. Approximately 110,000 EPE customers were impacted by rolling blackouts. By Saturday, February 5, EPE reported that its generating units were able to maintain generation through the night and the controlled load shedding was discontinued.

Following are the primary findings of this inquiry:

<u>EPE Preparation for Cold Weather</u>

- EPE followed its normal preparation procedures for winter weatherization
- EPE performed additional weatherization checks prior to the actual arrival of the extreme cold, based on weather forecasts
- Designed cold weather tolerances of EPE's current generation equipment and/or weatherization preparation were inadequate to prevent failures in the conditions during the event timeframe

<u>Weather During Event</u>

- The temperatures during this timeframe were generally unprecedented lows for the El Paso region, ranging from a low of one degree to highs in the teens
- Due to extreme cold, EPE generators failed and necessitated rolling blackouts

<u>Potential Corrective Action by EPE</u>

- EPE has several ongoing, but incomplete after-action evaluations of its system performance to determine what changes, if any, are needed going forward. Its primary after-action report is scheduled to be completed in June

<u>Regulatory Response</u>

- Western Electricity Coordinating Council (WECC) is the Regional Entity responsible for coordinating and promoting bulk electric system reliability for EPE's service territory. Consequently, EPE is subject to WECC's reliability standards and rules

- The North American Electric Reliability Council (NERC) along with WECC is conducting its own event analysis. This is being coordinated with an ongoing inquiry by the Federal Energy Regulatory Commission (FERC)
- At this time, PUC staff has not identified violations of the Public Utility Regulatory Act (PURA) or the PUC's Substantive Rules. However, EPE is subject to the Commission's electric service quality rules. PUC Staff reviews compliance with and prosecutes violations of these requirements on a yearly basis. Any service quality violations resulting from the cold weather event are not part of this report.
- EPE's actions during and after the weather event could have an impact on future EPE retail rates which are subject to review and approval by the Commission; the Commission has the latitude in utility rate cases to approve or disallow expenses proposed by the utility.

II. EPE Preparations for Cold Weather

The EPE generation fleet is primarily designed with operating limits to withstand typical temperatures for the El Paso area, including very hot summers. However, it is not designed to handle temperatures near zero degrees Fahrenheit during the winter. A design exception is EPE's newest unit, Newman 5, which is designed to operate to an ambient temperature of 14 degrees Fahrenheit. EPE follows an established weatherization plan that is implemented during the fall which includes various checklists, preventative maintenance work-orders, and training exercises for plant personnel.[1] Samples of EPE unit checklists are included in Attachment I, Samples of Freeze Protection Checklists and Schedules. The intent of the winter weatherization plan is to prepare the units and personnel for cold weather conditions, based on historical norms for El Paso weather. EPE's current weatherization plan could not prevent the loss of EPE's generation during the event on February 2, 2011, due to historic record low temperatures which exceeded EPE's weatherization plan.[2] Attachment II, Normal El Paso Weather and Temperatures, illustrates the monthly average temperatures for the El Paso area, including average highs and lows, as well as record high and lows.

EPE maintains an extensive winterization checklist for each of its local units. EPE asserts that in the 48 hours before the cold front arrived in El Paso, all items on the checklist were in place and properly functioning. PUC Staff will follow up to obtain EPE's documentation confirming its assertion that it inspected all of its plants using the checklist prior to the February event. Among the more important items on the checklist are ensuring that heat tracing circuits, heat lamps and space heaters are on and operating. A heat tracing circuit is cable that spirals around boiler instrument sensing lines, water pipes, key sensor equipment and other instruments, which produces heat that, along with insulation, keeps the boiler sensing lines, water pipes, sensor equipment and other instrumentation from freezing. All heat tracing circuits were in place and operational before the extreme weather arrived.

[1] See Attachment I Samples of Freeze Protection Checklists and Schedules

[2] See Attachment II Normal El Paso Weather and Temperatures

EPE utilizes several external resources to monitor weather conditions including four weather websites – AccuWeather, the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS), Weather Underground, and the Weather Channel. In addition to these online resources, EPE obtains real-time climate conditions from local news stations.

Late on January 31, and early on February 1, 2011, EPE's system was in stable condition with sufficient generation to cover both projected loads and reserve requirements. EPE scheduled extra generation on-line in anticipation of potential problems with access to remote generation of approximately 730 MWs. Units with a capacity of 85 MWs were not available due to a forced outage. Also available were two local units that were not being actively dispatched, but removed from service while remaining online and could be available within eight hours. All other local units were operating and being utilized.

In addition, on January 31, EPE inspected its substations, reviewed the current system operations plans, confirmed the Palo Verde Nuclear Generating Station was not experiencing any operating issues, and placed employees on call on an as-needed basis.

III. Actual Events

The following is a synopsis of the events that occurred in the EPE area during the severe weather conditions of February 2-5, 2011[3]. A complete time line of events that occurred during the emergency operations is further detailed in Appendix III, EPE System Operations Chronology of Events.

Weather During Event

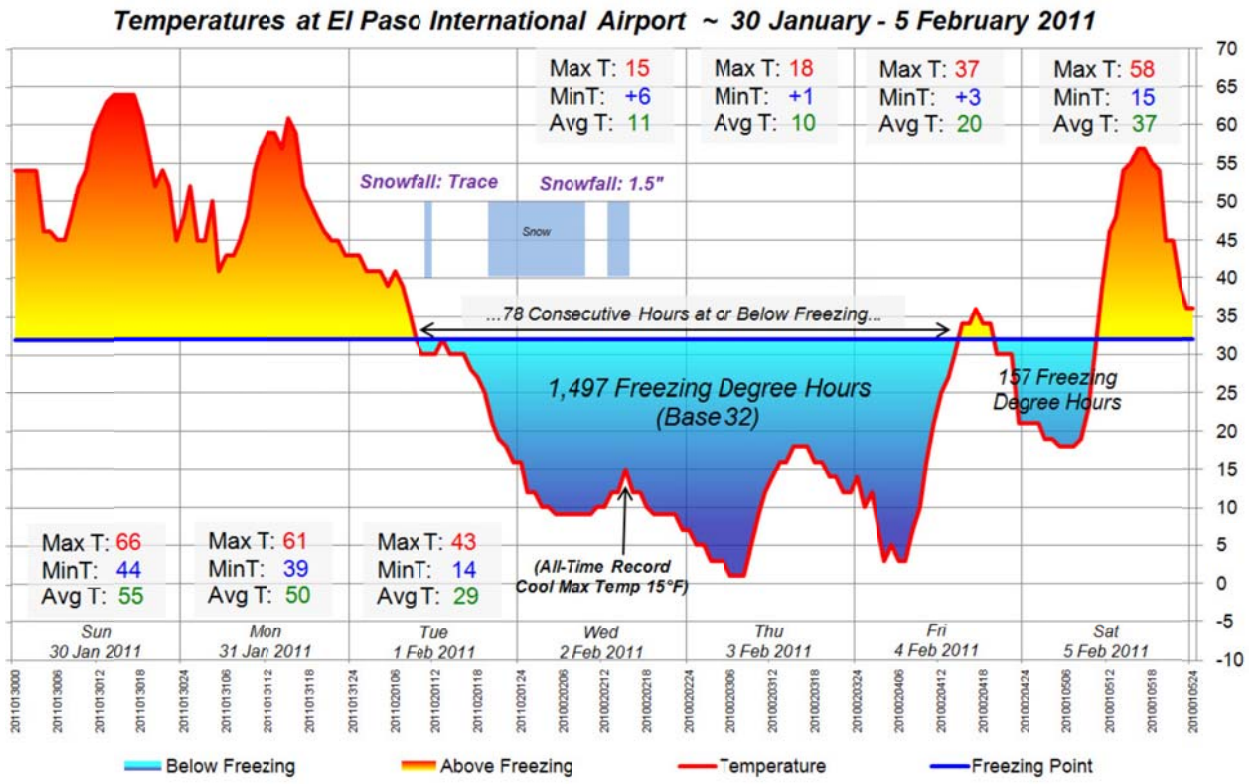
Temperatures in El Paso remained below freezing for at least 77 hours and 24 minutes. The low temperatures recorded during this time period were historic lows for February 2-4. EPE also experienced the coldest maximum temperature ever recorded on a February 2nd and the lowest high temperature recorded on a February 3rd. In all, EPE experienced seventy eight (78) consecutive hours of below 32º temperatures. The cold weather event set record temperatures levels for EPE[4]. Information regarding cold weather related outages of one or more EPE plants for duration of eight hours or more during the past 20 years is included in Appendix IV, History of EPE Cold Weather Outages.

The duration of freezing temperatures is significant because these conditions cause generators' water pipes, as well as sensory and monitoring equipment to freeze, and once this occurs, it hinders the ability to make the generating unit operable until repairs can be made.

During the emergency, EPE's distribution system remained operational with minimal impact related to weather conditions.

[3] See Attachment III EPE System Operations Chronology of Events

[4] See Attachment IV History of EPE Cold Weather Outages



Following is information regarding the well below normal temperatures that actually occurred in the El Paso area as compared to the forecast:

- February 2, 2011
  - Forecasted high temperature 37º; Actual high temperature 15º
  - Forecasted low temperature 14º; Actual low temperature 6º
  - Wind gusts 24-26 mph (higher than normal)
- February 3, 2011
  - Forecasted high temperature 30º; Actual high temperature 18º
  - Forecasted low temperature 14º; Actual low temperature 1º
  - Wind gusts 20 mph (higher than normal)
- February 4, 2011
  - Forecasted high temperature 43º; Actual high temperature 37º
  - Forecasted low temperature 21º; Actual low temperature 3º

The chart above[5], provided by NWS, shows the actual temperatures during the January 30 - February 5 time period. There were 78 hours at or below freezing during this period.

[5] Hardiman, Mike, Forecaster, National Weather Service El Paso, Texas, *Intense Cold Wave of February 2011 Report*

Impacts from Severe Weather

Generation Equipment Issues

On February 2, 2011, EPE lost approximately 650 MW of local electric generation out of a total capacity of 1,653 MW. As temperatures continued to drop and wind gusts increased, the dissipated heat around key power plant components accelerated the temperature drop of components necessary to operate the plant. Critical water lines froze and the instrumentation controlling the generation also froze.

EPE lost most local generation over seven hours on Wednesday, February 2, 2011. Approximately 55 MW of local generation was running throughout the EPE system and continued after the conclusion of the event.

On February 2 and February 3, as well as a portion of February 4, EPE tried several times to return more local generation to service but experienced equipment failures[6]. A complete list of Newman equipment failures is included in Appendix V, Newman Plant Equipment Failures. EPE experienced only one transmission line failure during the event (Newman to Butterfield 115-kV). This occurred when the Newman 4 Steam Turbine tripped, and ongoing breaker work had left that line on a common breaker with the steam turbine. As the load began to increase, the High Voltage Direct Current (HVDC) interconnection with Southwest Power Pool (SPP) tripped due to voltage-related stress (as opposed to cold-weather issues) resulting in the loss of approximately 170 MW imports over the tie. The Eddy County HVDC tripped on February 2, 2011 at approximately 6:00 p.m. and returned to service at approximately 11:00 p.m. The owners of the Eddy County HVDC Terminal do not have firm requirements on the terminal and treat the terminal as a non-firm facility. There are currently no significant future expenditures budgeted to upgrade this terminal.

Sustained low static temperatures, along with higher than normal wind velocity, caused EPE's generation equipment to experience abnormally high heat loss. Heavy winds created a challenge when trying to apply heat from external sources to frozen equipment. Heat input devices were unable to add sufficient heat which resulted in extended periods of almost zero degree temperatures to EPE generation equipment.

Operations Reactions

EPE's System Operations is responsible for the operation of the EPE electric system. Duties include power generation, transmission, purchased power, and fuels. Prior to the event, EPE scheduled resources to serve projected load.

When EPE realized local generation would not be returned to service they followed established procedures of curtailing interruptible customers. EPE executed controlled outages to help protect the health and safety of customers by preserving the system. This

[6] See Attachment V Newman Plant Equipment Failures

process was accomplished on a non-discriminatory basis across the entire EPE system in both New Mexico and Texas, with the exception of circuits containing critical customers. EPE worked with various emergency management systems as well as the media to communicate the conditions and outages that were affecting customers and the system.

On February 4, 2011 EPE returned 300 MWs of generation to service and discontinued load shedding. On February 5, 2011 EPE restored service to all interruptible customers. And finally on February 6, 2011 EPE restored service to all of its remaining customers.

Approximately 110,000 EPE customers were impacted by rolling blackouts. During the afternoon of February 2, EPE was able to stabilize its system. All local generation, with the exception of one unit, remained offline. Imports from remote generation resources and power purchases from Southern New Mexico Power allowed EPE to restore all firm load at approximately 12:20 P.M. MST. Interruptible loads remained offline at that time while power plant personnel tried to bring local generation units back online. EPE's transmission system remained intact overall, with one transmission line outage that did not impact the overall transmission system, as no generation was being delivered on that line due to generator failure. During the early evening hours of February 2, the Eddy County DC tie tripped and forced EPE to shed approximately 150 MW of firm load. Rolling blackouts were again implemented and EPE expected the rolling blackouts to continue until 11:00 PM MST that evening. EPE was able to end the rolling blackouts earlier than anticipated at 9:00 PM MST on February 2.

On February 3, equipment was restored which provided 130 MW of available power. The number of affected interruptible customers was reduced and EPE worked closely with the local media to make public appeals for customers to reduce their electricity usage. By 5:30 PM MST, EPE was again forced to implement rolling blackouts to keep system load in the 850 – 900 MW range in order to maintain system stability. These blackouts ended by approximately 10:00 PM MST.

During the morning hours of February 4, EPE suffered the loss of additional local generation and was forced to ration the available electricity to its customers again at approximately 6:30 AM MST. By approximately 12:05 PM MST, the electricity shortage had ceased and EPE was able to discontinue rolling blackouts.

By Saturday, February 5, EPE reported its generating units were able to provide energy continually through the night ending the need to reduce electricity usage. Demand was under 800 MW and EPE was generating 1,100 MW. Peak load was predicted to be under 950 MW and temperatures increased.

EPE's manual load shedding is performed through an Energy Management System (EMS). In the EMS, distribution feeders and transmission customers are grouped and pre-populated into 35 different load-shedding blocks. Blocks are prioritized based on the types of customer load that are dispersed throughout EPE's service territory.

Interruptible customers are interrupted first, and then firm customers. For firm load shedding, EPE prioritizes critical load customers into five categories. Customers of the highest priority (most critical customers) are the last to be without electricity and will not have interrupted service unless deemed absolutely necessary. The firm load customer priorities are as follows:

1. Highest – hospitals and dialysis centers
2. Government agencies and EPE's System Operations Control Center
3. Broadcast Stations
4. Water Pump Lift Stations
5. Lowest – No priority given (non-critical load firm customers)

Transmission System Issues

Prior to the loss of EPE local generation on February 2, 2011, EPE Transmission and Distribution systems were operating in a normal state with all 345-kV lines remaining in service. EPE line loading and voltages remained within standard limits. EPE's transmission system experienced only one transmission outage during the cold weather event on February 2, 2011. However, due to the lack of generation at the plant to deliver electrical load, the transmission outage had no actual additional impact on the situation.

Water Supply Issues

EPE has a municipal water supply that provides water supply to the generation plants. In addition, EPE maintains stored water at the plant, which did not pose a problem during the emergency. EPE did interrupt some of the El Paso Water Utilities (EPWU) load, but did so after coordinating and receiving agreement from EPWU prior to interruption of service.

IV. EPE Activities in Response to Event

Introduction

As described in more detail above, EPE has a long-established weatherization plan which it has followed regularly. EPE's weatherization plan is implemented during the fall, usually in the September - October timeframe. Its winter weatherization plans included various checklists, preventative maintenance work orders, and training exercises that emphasize how plant personnel can spot conditions that need attention. Annually, prior to the beginning of the winter weather, EPE winterizes its generating plants and verifies its substation equipment can withstand frigid temperatures. In addition to yearly preparation of generation, EPE verifies winterization of transmission and distribution facilities. EPE performed an additional review of its weatherization plans within 48 hours of the February 2-4 cold front. EPE inspected its substations, reviewed the current system operations plans, confirmed the Palo Verde Nuclear Generating Station was not experiencing any operating issues, and placed employees on call on an as-needed basis.

The company's actions during the event included, but were not limited to:

- Around-the-clock work by employees who attempted to protect critical equipment and sensors from freezing and to thaw and repair equipment and sensors that had frozen;
- Ongoing efforts to return local generation to service; and
- Controlled load shedding in established priority order to stabilize and safeguard the entire system

EPE is performing after-action evaluations in response to the event that at the time of this report are not complete. The primary after-action evaluation is scheduled to be complete in June. These evaluations may result in additional corrective action plans. These evaluations include:

- EPE is examining what cost effective, feasible measures might be used to lower the temperature operating limits of its power plants during prolonged cold weather. EPE anticipates completion of this evaluation in the next four weeks;
- EPE is exploring means to facilitate more efficient use of gas turbines during cold weather; and
- EPE is investigating the design temperature ranges of its generation facilities other than Newman Unit 5 and its new Rio Grande unit.

PUC staff will review the results of these evaluations and any forthcoming corrective action plans.

Ongoing or Potential Corrective Action by EPE

Training

EPE has begun several training sessions for operators regarding blackstart operation events in an effort to maintain the reliability of its system.

Additional Weatherization

EPE has hired an outside consultant, Black and Veatch, to examine EPE's local generation to identify what cost-effective steps could be taken to strengthen the weatherization of EPE's plants.

Gas Turbine Cold Weather Performance

When gas turbines are combined with steam turbines the result is a combined cycle plant which is typically more efficient than gas turbines and steam turbines operating separately. Before and during the event, EPE's Newman Unit 5 was in the process of being converted to a combined-cycle plant. The unit had been unavailable before February 4 (except for testing quantities which at the time of the emergency was 5 MW) because of this conversion from a single-cycle to a combined cycle unit. However, even during such a conversion, the plant would be able to re-start if temporarily converted back to a single cycle unit. In order to bring Newman Unit 5 back on line as a single-cycle unit, EPE blocked exhaust from the gas turbine from going to the steam generator, thus allowing the unit to come on line as a gas turbine generator. EPE is exploring means to facilitate such blocking on a more expedited basis when necessary.

Operation of Power Plants is Cold Weather Areas

EPE compared the operation of its generation plants to similar power plants located in northern climates in order to determine if there are cost-effective ways to allow the units to operate at lower air temperatures while not also overheating plant equipment in extreme summer heat conditions. In order for plant design with extreme cold tolerance to be cost effective, the option of enclosing all plant equipment needs to be incorporated in the original plant design. When designing its plants, EPE considered several design elements. These considerations included the fact that El Paso weather is more severe in the summer than in the winter and that additional heat results from enclosed equipment. Based on these heat-related considerations, EPE determined that equipment contained within an enclosure would be a reliability concern and less efficient than a non-enclosed design. EPE is undertaking an evaluation of effective, feasible measures from other options, including partial plant enclosure (specific equipment, but not entire plant). EPE anticipates this evaluation should be completed sometime in early May 2011.

Future EPE Generation Plant

EPE's new Rio Grande unit that is being built will be a simple cycle gas turbine. This new unit is designed and is being built to withstand extended periods of time at zero degrees Fahrenheit. This is an upgrade from the design tolerance of EPE's newest plant, Newman Unit 5, which is 14 degrees Fahrenheit. The design temperature ranges for EPE's local generation other than Newman Unit 5 are still under investigation by EPE. The new Rio Grande unit is scheduled to begin operations of its 87-MW unit by the summer of 2013.[7]

High Voltage DC Tie With Southwestern Public Service Company

Southwestern Public Service Company (SPS) operates the Eddy County HVDC Terminal for EPE under a contractual agreement. SPS determined the terminal failed due to a failed piece of equipment that was replaced and returned to service. EPE noted there are no planned significant future expenditures to upgrade the terminal. EPE also noted that the two owners of the terminal do not have firm requirements on the terminal and treat the facility as a non-firm service, also called interruptible service or as-available service.

V. Regulatory Response

The review of EPE's system performance during the El Paso weather event is the subject of review by multiple entities. These include the New Mexico Public Regulation Commission (NMPRC), FERC, NERC, the Department of Energy (DOE), and the Western Electricity Coordinating Council (WECC).

[7] *El Paso Times*, Wednesday, February 23, 2011

The FERC has an ongoing inquiry into the El Paso event. In coordination with the FERC inquiry, NERC and WECC are conducting an event analysis. EPE is subject to WECC reliability standards pursuant to NERC and FERC rules.

The PUC's principal regulatory authority over EPE is in setting its retail rates and enforcing service quality standards that are specific to transmission line performance. EPE is also required to file an annual emergency operations plan with the Commission. Because EPE is not in the ERCOT Region, reliability standards as addressed in this report are within the purview of WECC, FERC, and NERC.

The following findings are specific to enforcement of, and potential administrative penalties for, violations of PUC rules and regulations to which EPE must adhere. The review and analysis performed by the PUC and described in this report yields the following findings regarding relevant rule compliance related to the El Paso Weather Event on and around February 2, 2011:

- Ratemaking issues for EPE relevant to the weather event could include:
  - Increased capital expenditures for reliability improvements
  - Higher Operations and Maintenance expenses
  - Higher proportion of equity and adjusted authorized return on equity based on risk
  - Increased regulatory expenses from various required responses and reports
  - Additional consultant and legal costs for related studies and proceedings
  - Potential non-traditional cost recovery mechanisms
  - Use of interruptible rate structure
- At this time, PUC Staff has not identified violations of PURA or the PUC Substantive Rules by EPE;
- EPE is subject to the Commission's requirements related to electric service quality. Potential violations of these rules are investigated and prosecuted on a yearly basis; and
- EPE timely filed its required Emergency Operations Plan in accordance with PUC Substantive Rules

The PUC Staff will continue to monitor the event results and subsequent forthcoming information as EPE and the various regulatory agencies complete their ongoing investigations.

VI. Summary

Even though EPE made preparations for forecasted cold weather, it lost a large portion of its local electric generation due to equipment failures caused by the arctic cold front in early February 2011. As a result of the significant generation shortage, EPE was forced to temporarily (four separate intervals over three days for a total of 18 1/2 hours) interrupt electric service to some users in order to maintain system stability. Approximately 110,000 EPE customers were impacted by these rolling blackouts. Several federal and state regulatory agencies are involved in ongoing inquiries regarding the situation and EPE has several potential corrective action plans either under way or under study.

Attachment I

Samples of Freeze Protection Check Lists and Schedules

Operations Freeze Protection General Check List

Item	Description	Notes	Complete
1.	Check all heat tracing circuits to be on.		
2.	Check Boiler wash line drain valves open.		
3.	Check traps and drains on condensate reclaim from oil heaters.		
4.	Start some flow through condensate line to the lab.		
5.	Check lights on U1 - U2 - & U3 Fuel gas regulators.		
6.	All space heaters checked to see if operating properly.		
7.	Check heat tracing/freeze protection on all boiler level and pressure controls.		
8.	Heaters in Boiler chemical room burning.		
9.	Check for water in control air to regulators		
10.	Boiler economizer recirculating line open on U1		
11.	Check for fans off in U4 Skids		
12.	Heat lamp and heat tracing on auxiliary cooling water for U4 Unit.		
13.	Boiler blow down loop checked to see if it is free of water.		
14.	Cooling water to forced draft fan and air preheater oil coolers checked for flow.		
15.	Acid feeders cabinet heaters on		
16.	Fans off on U1,U2,U3 Boiler feed pump area and close all louvers on air inlets.		
17.	Vacuum gage line from condenser to control room should have small amount of air		
18.	Water to exciter air wash should be shut off and drain open to sewer.		
19.	Drain valves instrument and service air receivers to be opened wide and closed as often as necessary to prevent accumulation of water, also put heat lamp under each reciever		
20.	U1,U2,U3 Emergency tower make up small amount of flow.		
21.	Have some flow through screen wash line into towers.		
22.	R.O. outside shower and valve for service roster out side on south side of R.O.building		
23.	Keep fuel oil circulating at temperature between 150° and 180°.		
24.	Check heat tracing on U 4 steam to throttle pressure control.		
25.	Rotate cooling tower fans to minimize forming of ice on tower.		

Operations Freeze Protection General Check List

26.	HRSG1 and 2 heat tracing drum level and feedwater flow.		
27.	Have flow through any line that you are in doubt about freezing. -		
28.	Check lights on U 1 - U 2 - U 3 Instrument air receivers.		
29.	Water to 02 Analyzer should be checked and flow increased if needed.		
30.	Check heat lamp on U 2 deaerator regulator.		
31.	Air bleed valves on U 4 instrument air systems south and north end of Unit.		
32.	Shut off and drain distilled water line between old plant and U 4 Unit.		
33.	HRSG 1 & 2 feedwater and condensate flow cabinets.		
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Operations U4 Freeze Protection Check List

Item	Description	Notes	Complete
1.	Turn on heat lamp on acid pump at #4 cooling tower.		
2.	Auxiliary cooling water transmiter heat lamp in box and heat tape outside of box.		
3.	Place a heat lamp on auxiliary water cooling regulator.		
4.	Turn on space heater and shut fans off in air skid, crack manual air bleed valves on air receiver tanks.		
5.	Place heat lamps on boiler feed water regulators on both GT's.		
6.	4B level transmitter heat tape.		
7.	Centrifuge heating element.		
8.	Place heat lamps on condensate regulator's on both GT's.		
9.	Small amount of water flow around fire pump low pressure switch.		
10.	Swap service water pump to "A".		
11.	Turn on heaters in skids.		
12.	Winterize evaporative coolers.		
13.	Circulate water from 4B to 4A through gravity valve and run transfer pump from 4A to 4B below 32 degrees.		
14.	Heat lamps and space heaters for transmitters (hp drum, level 1p drum level, condensate flow, feed water flow) on both GT's.		
15.	Heat lamps 250# Gas regulators in cabinet.		
16.	Turn on heat tracing panels on both GTs and the steamer.		
17.	Rotate cooling fans to minimize freezing forming of ice on tower.		
18.	Block and drain park pumps and sprinkler system.		
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Operations U5 Freeze Protection Check List

Item	Description	Notes	Complete
1.	Mee fog system lay-up. Open all valves on the inlet and the outlet side of pumps including at the pumps. Block main water supply valve before prefilter. Drain prefilter and pull the filter.		
2.	Test all heat tracing panels. Lockout and tag breakers in the PDC.		
3.	Check space heaters in skids		
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Space heater schedule			
No.	Location	Notes	Operating
1.	U1 Aux Floor North Wall		
2.	U1 Aux Floor @ Elevator		
3.	U1-2 Aux Floor		
4.	U1 Chem House		
5.	U2 Chem House		
6.	U3 Chem House		
7.	U4 Deluge Bldg		
8.	Shop		
9.	RO East		
10.	RO West		
11.	DI Bldg		
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Instrumentation Freeze Protection Schedule

Item	U1	Notes	Operating
1	Boiler bi color gauge sensing lines. - 7th floor.		
2	Electromatic relief valve transmitter sensing line - 7th floor.		
3	Drum pressure transmitters a & b sensing line. - note: no heat tracing on sensing line. - 7th & 6th floor.		
4	Drum level, air flow, drum pressure transmitters cabinet, turn on heat element inside cabinet. - 6th floor.		
5	Dea pressure transmitters sensing line.		
6	Dea level transmitters level column.		
7	Condensate pumps a & b discharge pressure transmitters sensing lines. - 1st floor.		
8	Turn on heat lamp to #1 cooling tower acid day tank acid pump cabinet.		
9			
10			
11			
12			
Item	**U2**	**Notes**	**Operating**
1	Emergency steam regulator controller cabinet. - plug in extension cord to heat lamp inside cabinet. - 7th floor.		
2	Electromatic relief valve transmitter sensing line. - 7th floor.		
3	Drum pressure transmitter sensing line. - 7th & 6th floor.		
4	Drum level, air flow, drum pressure transmitters cabinet, turn on heat element inside cabinet. - 6th floor.		
5	Turn on heat lamp to #2 cooling tower acid day tank acid pump cabinet.		
6			
7			
8			
9			
10			
11			
12			
Item	**U3**	**Notes**	**Operating**
1	Electromatic relief valve transmitter sensing line. - 7th floor		
2	Drum pressure transmitter cabinet's sensing lines underneath cabinet. - 7th floor.		
3	Dea level transmitters sensing lines outside of cabinet. - 5th floor.		
4	Turn on heat lamp to #3 cooling tower acid day tank acid pump cabinet.		
5			
6			
7			
8			

9			
10			
11			
12			
Item	**HRSG2**	**Notes**	**Operating**
1	High pressure circ. pump differential pressure transmitter sensing lines 1st floor.		
2	Main BFP discharge pressure transmitters sensing lines inside p.s. & g. cabinet at b.f.p. skid.		
3	Boiler transmitters cabinet. - sensing lines. - turn on heat lamp. - 1st floor.		
4	2" bypass regulator controller's sensing line. - install heat lamp. - 2nd floor.		
5	Condensate regulator & high pressure vent vlv instrument air supply line. - install heat lamp. - south 4th floor.		
6	Dea pressure transmitter a & b sensing line. - 3rd floor.		
7	Dea level sight glass cabinet. - install heat lamp. 2nd floor.		
8			
9			
10			
11			
12			
Item	**HRSG1**	**Notes**	**Operating**
1	High pressure circ. pump differential pressure transmitter sensing lines.- install heat lamp. - 1st floor.		
2	Main BFP discharge pressure transmitters sensing lines inside p.s. & g. cabinet at BFP.		
3	Boiler transmitter cabinet. - sensing lines. - turn on heat lamp. - 1st floor.		
4	2" bypass regulator controller's sensing line. - install heat lamp. - 2nd floor.		
5	Condensate regualtor & high pressure vent vlv instrument air supply line. - install heat lamp. - south 4th floor.		
6	Dea pressure transmitters a & b sesnsing line. . - 3rd floor.		
7	Dea level sight glass cabinet. - install heat lamp. - 2nd floor.		
8			
9			
10			
11			
12			
Item	**U4ST**	**Notes**	**Operating**
1	Main steam bypass vlv instrument air supply line. - install heat lamp. - top of condenser building.		
2	Turbine drain vlvs instrument air supply lines. - install heat lamp.		

3	Cooling tower acid day tank instrument air supply line. - install heat lamp at north west corner of cooling tower.		
4	Cooling tower turn on heat lamp to #4 cooling tower acid day tank pump cabinet.		
5	Distilled water tank transmitter sensing line. - note: sensing line is heat traced but not insulated.		
6	Effluent water tank transmitter sensing line. - note: it is not heat traced nor insulated, cabinet needs to have a heat element and		
7			
8			
9			
10			
11			
12			
Item	**Plant General**	**Notes**	**Operating**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

U1 Heat Tracing Schedule			
Circuit No.	LOCATION	AMPS.	AMPS 2009
1.	J.B. 6th Fl. South Side Boiler		
1A.	Strip Heater Service Water Transmitter		
1B.	Strip Heater Drum Level Compensator		
2.	J.B. 6th Fl. North Side Boiler - Split 2 circuit 110		
3.	Chem. Pp Room to Boiler		
4.	Piping at Service Water Tank		
5.	J.B. 4th Fl. Auxiliary Steam		
6.	Piping at Oxygen Analyzer		
7.	Levels at Deaearator		
8.	Deaearator Level Gauge Encl.		
9.	J.B. 2nd Fl. Deaerator Dishcarge		
10.	Yarway Level		
11.	High Pressure Gauge		
12.	Boiler Fill Pump		
13.	Boiler Fill Piping		
14.	6" Condensate Makeup		
15.	3" Condensate Makeup		
16.	10" H2 Cooling East Side		
17.	10" H2 Cooling West Side		
18A.	Condenser South Valves & Gauges		
18B.	Strip Heaters 1A & 1B Distilled Water Tank Tranmitters		
19.	Piping between Chem Pp Room & Aux. A		
20.	Piping between Chem Pp Room & Aux. A		
21A.	Air Sensing Lines 2A Instrument Air & Service Air		
21B.	1 1/2" N.B. Corner		
22.	Deaerator Pipe		
23.	Evap. Scale Cracking Line		
Note: #22 & 23 are 110 volt Ckts. On Block #22			

U2 Heat Tracing Schedule			
Circuit No.	**LOCATION**	**AMPS last**	**AMPS 2009**
1.	Boiler Feed Recirc. Lines A & B (2A-3.28 Amps) (2B-3.29 Amps). Took amp.		
	Checks @ junction box located @ 5th fl. West side by lines.		
2.	Low Temp. Reheat Spray 5th Fl.	3.5	
3.	Reheat Attemperator Spray 4th Fl. N & South	4.5	
4.	Condensate Return & Trap Between Units 1 & 2	4.5	
5.	Blowdown Flash Tank & Gauge Blases on Deaerator	3.0	
6.	Boiler Drum Sample Line-South	4.3	
7.	Chemical Feed Lines	2.5	
8.	Dist. Water Tank 2B & Piping	5.0	
9.	Dist. Water Tank 2B & Piping	5.0	
10.	Spare		
11.	Steam Sample Lines	4.0	
12.	Deaerator Controls & Sample Line	4.0	
13.	Spare		
14.	Dist. Water Tank, Piping & Heat Lamp @ Gas Valve	6.8	
15.	Oxygen Analyzer Line	3.0	
16.	Boiler Drum Sample-North & Econ-Sample Lines	3.75	
17.	Inst. Line Yarway Drum Level	5.5	
18.	Inst. Line Yarway Drum Level	4.5	
19.*	Emergency Steam North East 7th Fl.. Powered by 120vac. Circuit from	6	
	outlet and from heat tracing panel.		
20.*	Gland Seal Steam Reg. and Dea Pressure Transmitter	6	
	6th Fl. North Side.		
Note: * Identifies new heat trace that is not powered by Heat Tracing Panel.			

U3 Heat Tracing Schedule		
LOCATION	**AMPS.**	**AMPS 2009**
Boiler Feed Recir. Lines	3.0	
Low Temp. Reheat Spray S/H	3.5	
R/H Attemperator Spray	4.5	
Condensate Retrun & Trap between Units 1 & 2	4.5	
Blowdown Flash Tank & Gauge Glasses on Deaerator	3.0	
Boiler Drum Sample Line South	4.3	
Chemical Feed Lines	2.5	
Dist. Water Tank 2B & Piping	5.0	
Dist. Water Tank 2B & Piping	5.0	
Spare Steam		
Sample Line	4.0	
Deaerator Controls & Sample Line	4.0	
Spare		
Dist. Water Tank & Piping & Heat Lamp @ gas valve	6.8	
Oxygen Analyzer Line	3.0	
Boiler Drum Sample - North & Econ. Sample Lines	3.75	
Inst. Line Yarway 220v Drum Valve	5.5	
Inst. Line Yarway 220v Drum Level Drum Pressure Gage 3rd floor	0.5	

UNIT 3-HEAT TRACING
FED FROM PANEL TRD

U3 Heat Tracing fed from Panel TRD			
Circuit No.	**LOCATION**	**AMPS.**	**AMPS 2009**
1.	A-1 SUPER HTR. ATTEMP.-LOW TEMP ATTEMP.		
2.	A-2-BFP RCVR LINES.		
3.	3-A-3-BFP BALANCING LINES		
4.	A-4-CHEM FEED LILNES, AUX. STM. TO OIL BRNR, BLR. INST. PIPING		
5.	A-5-BLR INST. PIPING, CHEM FEED, BFP. DISCH & SUCT.		
6.	A-6 SAMPLE AND SAMPLE COOLING LINES.		
7.	A-7 INST. PIPING BLR. AREA.		
8.	A-8-FUEL GASLINES INST. PIPING TURBING AREA.		
9.	BLOWDOWN.		
10.	A-10 DEA & BLOWDOWN TANK STAND PIPE, EVAP STAND PIPE.		
	AIR REMOVAL-COND. VENT & OUTLET VENT.		
11.	A-11-COND. MAKEUP TO DISTILLED WATER TANK.		
12.	BOX 1-4 #12		
13.	BOX A-7.		
14.			
15.			
16.			
17.			
18.	BLR. DRUM LVL. HEAT LAMPS.		
19.			
20.			

U4 Heat Tracing Schedule		
Circuit No.	**LOCATION**	**Protected Piping**
	HRSG1	
ET1-1A LT755M10 H250K0550707	TA410, AM730,HRSG wall at water sample skid	common drain to blowdown tank

	HRSG2	

	GT1	

	GT2	

Notes

Attachment II

Normal El Paso Weather and Temperatures

The information below indicates monthly average temperatures for the El Paso area, including average monthly highs and lows:

El Paso Weather Records and Averages[1]

Month	Avg. High	Avg. Low	Avg. Precip	Rec. High	Rec. Low
January	57.0 °F	33.0 °F	0.45 in	80.0 °F(01/24/1970)	-8.0 °F (01/11/1962)
February	63.0 °F	38.0 °F	0.39 in	86.0 °F(02/24/1904)	5.0 °F (02/12/1899)
March	70.0 °F	44.0 °F	0.26 in	93.0 °F(03/20/1907)	14.0 °F (03/03/1971)
April	78.0 °F	51.0 °F	0.23 in	98.0 °F(04/21/1989)	23.0 °F (04/08/1983)
May	87.0 °F	61.0 °F	0.38 in	105.0 °F(05/23/2005)	31.0 °F (05/02/1967)
June	95.0 °F	69.0 °F	0.87 in	114.0 °F(06/30/1994)	46.0 °F (06/01/1988)
July	94.0 °F	72.0 °F	1.49 in	112.0 °F(07/10/1979)	56.0 °F (07/23/1880)
August	92.0 °F	70.0 °F	1.75 in	110.0 °F(08/06/1885)	52.0 °F (08/10/1880)
September	87.0 °F	64.0 °F	1.61 in	104.0 °F(09/01/1982)	41.0 °F (09/30/1945)
October	78.0 °F	52.0 °F	0.81 in	96.0 °F(10/05/1994)	25.0 °F (10/30/1970)
November	66.0 °F	40.0 °F	0.42 in	87.0 °F(11/02/1983)	1.0 °F (11/29/1976)
December	57.0 °F	33.0 °F	0.77 in	80.0 °F(12/02/1973)	-5.0 °F (12/31/1880)

Normal/Average Temperatures for EPE

- February 2
  - Minimum air temperature, 35º
  - Maximum air temperature, 60º
- February 3
  - Minimum air temperature, 35º
  - Maximum air temperature, 61º
- February 4
  - Minimum air temperature, 35º
  - Maximum air temperature, 61º

[1] http://weather.yahoo.com/climo/USTX0413_f.html?woeid=2397816

ATTACHMENT III

System Operations Chronology of Events

EXHIBIT C

SYSTEM OPERATIONS APPENDIX A – CHRONOLOGY OF EVENTS

The following time line provides a chronology of events that occurred during emergency operations.

Definitions/Acronyms:

Afton – Generating facility owned and operated by Public Service of New Mexico (PNM)
EEA – Energy Emergency Alert
LEF – Luna Energy Facility (operated by PNM)
RC – WECC Reliability Coordinator

Date	Time (MST)	Event	Approximate MW involved	Capability
2/1/2011	15:39	Newman 5 GT3 and GT4 tripped	5 & 5	70 & 70
	15:43	Newman 5 GT3 back on-line	5	73
	16:14	Newman 5 GT4 back on-line	5	70
	20:07	Newman 3 Generator tripped	40	101
	22:15	Rio Grande 6 tripped -- RC called	50	50
	22:52	Supervisor of Load Research notified to interrupt interruptible customers		
	23:45	Copper Generator on-line	55	60
2/2/2011				
	0:10	Newman 5 GT3 taken off-line	5	70
	0:26	Newman 5,GT4 taken off-line	5	70
	1:21	Lost control of Newman4 -- still on-line with output constant		
	1:49	Rio Grande 8 tripped	60	145
	1:53	RC notified ; EPE issued EEA1 at 1:55		
	2:02	DC tie started and ramped to 100 MW	100	
	2:27	LEF generation requested by EPE		
	2:58	LEF on line	12	
	3:17	Newman 4 GT1 tripped	45	73
	3:20	Four Corners #4 tripped	50	54
	5:07	DC tie dropped from 100 MW to 48 MW		
	5:12	RC increased EEA to EEA 2		
	6:20	DC tie increased from 48 MW to 100 MW		
	7:11	DC tie increased from 100 MW to 127 MW		

	7:12	Newman 4 Steam Turbine tripped	25	64
	7:16	Newman 4 GT2 tripped	70	73
	7:22	Load shed started; load was at 982 MW		
	7:32	RC declared EPE to be in an EEA 3		
	7:35	Load dropped from 982 to 812 MW (170 MW in 13 minutes)	170	
	7:38	LEF at peak output	425	
	7:45	Load Research group notified to keep interruptible customers off line		
	7:55	Luna Energy Facility lost approximately 100 to 132 MW		
	8:00	Load at 813 MW and more shedding started		
	8:05	Load shed down to 710 MW (103 MW shed)		
	8:16	LEF ramped up	235	
	9:51	Afton on line		
	12:17	Load shed ends load increases to 977 MW		
	12:19	RC declares EPE decreased to EEA 2		
	18:04	Eddy DC tie trips	173	
	18:11	Load shed starts for evening peak loads		
	18:15	RC declares EPE at EEA 3		
	20:58	Load shed ceases, RC declares EPE decreased to EEA 2		
	23:04	Eddy DC tie on-line		
2/3/2011				
	15:45	Afton trips	80	
	16:23	Afton back on-line		
	17:00	RC declares EPE increased to EEA 3		
	17:30	Load shed of 100 MW started.		
	18:52	Newman GT-1 on-line		
	19:20	Newman GT-1 trips off-line		
	21:32	Newman GT-1 on-line		
	22:30	Newman GT-2 on-line		
	22:40	RC declares EPE decreased to EEA 2		

2/4/2011	2:02	Newman GT2 trips due to stator high temp alarm		
	2:04	Newman GT1 trips due to stator high temp alarm		
	3:17	Luna steam turbine tripped	25	
	3:23	A Luna GT drops from 90 MW to 30 MW to 11 MW per PI		
	3:51	Luna steam turbine back on line and slowly ramps upper PI		
	6:30	RC declares EPE increased to EEA 3		
	6:30	Load shed begins (rolling blackouts) -- to 850 MW (100 MW dropped)		
	6:49	Newman GT2 comes on-line		
	12:05	Load shed ends		
	12:12	RC declares EPE decreased to EEA 2		
	15:57	Newman 5 GT-4 on-line -- stable at 50 MW	50	
	17:12	Rio Grande 8 on-line -- stable at 50 MW	50	
2/5/2011	16:07	Newman GT3 on-line		
	16:30	RC declares EPE decreased to EEA-1 -- due to additional generation		
2/6/2011	9:46	RC declares EPE decreased to EEA-0 All interruptible are allowed to resume normal energy usage		
	11:00	DC tie off-line		

The System Operations Department took precautionary steps to prepare for the approaching winter storm. On Monday, January 31, the Manager of System Controllers met with management from other departments to coordinate actions between System Operations, Generation, Marketing, and Transmission and Distribution. Power Marketing was requested to keep all local units on line or available in the event that load demand increased or generation contingencies occurred during the storm. The Assistant Vice President of System Operations and the Manager of Energy Analysis were asked to have personnel on call if extra help was needed at the System Operations Control Center. The Supervisor of Distribution Dispatching was asked to have crews available for any storm trouble, and the Superintendent of Distribution Systems was to be available should problems arise.

The System Operations Department maintained its round-the-clock operation and called in extra personnel (6 employees) to help man the transmission, generation, and scheduling desks. System Operations

managers (4) worked 15-hour days during the emergency, while other departments (T&D and EMS Support) kept an available contact 24/7 at the Control Center.

The following is an explanation of the events that occurred.

Tuesday, February 1, 2011

- On Tuesday, February 1, record-low temperatures occurred within El Paso Electric's (EPE) service territory. At approximately 8:00 p.m. that evening, the first of EPE's gas-fired generators tripped off-line due to frozen equipment. Newman No. 3 was producing 40 MW of its 101 MW capability at the time of the trip.

- Two hours later, Rio Grande No. 6 also tripped as a result of a frozen gas transmitter. Rio Grande No. 6 was producing its full capability of 50 MW. System Controllers contacted the Western Electricity Reliability Council's (WECC) Reliability Coordinator and advised him of the loss of local generation.

- At 10:52 p.m. System Controllers requested that interruptible customers be curtailed due to the extreme weather conditions, anticipated load increase, and the loss of local generation. The Copper Generator was brought on-line at 11:45 p.m.

Wednesday, February 2, 2011

- On Wednesday, February 2, twenty minutes past midnight, the Newman gas turbines GT3 and GT4 also tripped due to frozen equipment. One-hour later, automatic generation control (AGC) on Newman Generating Unit No. 4 was lost, but the unit remained on-line.

- Rio Grande No. 8 tripped at 1:49 a.m. causing the additional loss of 145 MW of generation capability. Rio Grande No. 8 is an essential unit in the operation of the system because of the dynamic reactive support it provides. System Controllers contacted the Reliability Coordinator, and the Coordinator initiated an Energy Emergency Alert (EEA) Level 1. Under Alert 1, EPE anticipated conditions where all available resources would be committed to meet firm load and sustaining required Operating Reserves may be a problem.

- At 2:00 a.m., a power purchase was made from Southwest Public Service (SPS) and the Eddy DC tie was started and ramped to 100 MW. During that hour, EPE requested generation from the Luna Energy Facility (LEF) in Deming, New Mexico.

- Newman Generator No. 4 tripped at 3:17 a.m. and 73 MW of capability was lost. Shortly thereafter, Four Corners Unit No. 4 tripped, causing EPE to lose 54 MW of its allocated 104 MW.

- System Controllers contacted the WECC Reliability Coordinator (RC), and at 5:12 a.m. the EEA was raised to a Level 2 Alert. This Alert advised other utilities that EPE was placing its load management procedures in effect due to its energy deficient condition. Procedures under this Alert included public appeals to reduce demand as well as other demand-side management procedures. Management officials contacted the NEWS media later that morning and urged customers to conserve power by asking them to cut back on unnecessary power use.

- At 7:12 a.m., the Newman No. 4 steam turbine tripped, and a few minutes later its associated GT2 unit tripped for a total loss of 137 MW of generation capability. With this generation trip, Copper was the only local unit remaining on-line, producing 55 MW of power. It was also the only local unit that could supply the system with dynamic reactive support.

- At this time, System Controllers initiated controlled load shedding in order to balance load with generation and maintain voltage stability. Area load was at 982 MW, and approximately 170 MW

of firm load was shed within 13 minutes. The Reliability Coordinator was immediately contacted, and EPE's EEA status was increased to a Level 3 Alert. A Level 3 Alert advised other utilities that EPE had implemented firm load interruptions. System Operations personnel met with T&D employees to ensure that transmission facilities were available for transmitting all available power into the El Paso service area. Power import capability into the El Paso area, however, was limited due to a short supply of reactive power support.

- At approximately 8:00 a.m., System Operations was notified that the Luna Energy Facility (LEF) lost approximately 130 MW of generation. Load shedding continued, and another 103 MW was shed until load stabilized at 710 MW. System Operations prepared report filings on its disturbances and provided them to the various regulatory agencies.

- At approximately 10 a.m., PNM's Afton generator was placed on-line and arrangements were made by the EPE's Power Marketing group to obtain power from that unit on an hourly basis. Power Marketing arranged purchases throughout the day; those purchases averaged about 400 MW. In addition, Marketing purchased 75 MW of spinning reserve in order to maintain EPE's spinning reserve obligation.

- Controlled load shed ended at 12:17 p.m. with load remaining at 977 MW. The Reliability Coordinator was contacted, and EPE's EEA alert level was decreased to a Level 2.

- The Eddy DC tie tripped at 18:04, and 173 MW of power was lost. Several minutes later, controlled load shedding resumed because of this loss of resource. The Reliability Coordinator was notified, and EPE was placed under an EEA Level 3 status. Controlled load shedding stopped at 9 p.m., and EPE's EEA alert level changed back to a Level 2. The Eddy DC tie resumed power transmittal at 11 p.m.

Thursday, February 3, 2011

- On Thursday, February 3, at approximately 3 a.m., Four Corners Unit 5 was curtailed by 25 MW and then returned to full capacity at 4:23 a.m. An hour and half later, Unit 5 was curtailed again by 48 MW and then increased by 25 MW at 8:33 a.m. APS was able to put Four Corners Unit #4 back in service at 12:48 p.m.

- During this period, the System Planning group performed power flow analyses of the current system conditions. Their results showed that certain EPE load levels could be maintained safely for minimum Southern New Mexico generation scenarios. According to their studies, in order to maintain system stability, EPE had to keep loads at or below certain levels depending on the status of the Afton, LEF, Eddy HVDC tie and local generating units. The power flow studies were based on N-1 criteria and determined that only a load level of 850 MW could be maintained until more local generation could be placed on-line.

- At 15:45 p.m., PNM's Afton generator tripped causing EPE to lose 80 MW of purchased power. A little over half an hour later, PNM was able to put Afton back on-line.

- The Reliability Coordinator was contacted, and EPE's EEA status was increased to Level 3 Alert. At 17:30 p.m., the controlled load shedding resumed and approximately 100 MW of load was dropped in order to maintain an 850 MW load level, which was revised to a 930 MW load level when GT1, then GT2 were brought on-line during the controlled load shedding as stated below.

- Newman GT1 was brought on-line at 18:52 but tripped at 19:20. An hour later, it was brought back on-line and slowly ramped up to 10 MW. Newman GT2 was brought on-line at 22:30 and stabilized at 9 MW.

- The controlled load shedding ended at 22:37. The RC decreased EPE to EEA level 2 at 22:40.

Friday, February 4, 2011

- On Friday, February 4, at 2:00 a.m., both Newman GT1 and GT2, which had been running at minimum power output but did provide dynamic reactive support to the system, tripped due to a stator high temperature alarm. At approximately 3:00 a.m., the LEF steam turbine tripped and one of its gas turbines dropped from 90 MW to 11 MW. The steam turbine was brought back on-line at 3:51 a.m. and slowly ramped up.

- At 6:30 a.m., with Copper again as the only local unit on-line, the controlled load shedding resumed and approximately 100 MW of load was dropped in order to maintain an 850 MW load level. The Reliability Coordinator issued an EEA Level 3 for EPE.

- Newman GT2 was brought on-line at 6:49 a.m., and the maximum EPE load level was increased to 930 MW. The controlled load shedding ended at 12:05 p.m. EPE's EEA status was changed to a Level 2.

- At 4:00 p.m., the Newman GT4 unit was brought on-line and remained stable at a 50 MW output. An hour later, the Rio Grande No. 8 unit was on line and was stable at 50 MW. No controlled load sheddingwas required for the Friday night peak-load period.

Saturday, February 5, 2011

- On Saturday, February 5, at 4:50 p.m., the Reliability Coordinator modified EPE's EEA status to a Level 1 due to additional generation.

Sunday, February 6, 2011

- The Reliability Coordinator decreased EPE's EEA to a Level 0 on Sunday, February 6, at 9:46 a.m.

ATTACHMENT IV

History of EPE Cold Weather Outages

PUCT QUESTION

Please provide detailed information on any cold weather related outages of one or more plants for a duration of 8 hours or more within your service territory during the past 20 years. For each of those events, please include the 5 day weather conditions (2 days before the event, day of outage, 2 days after), actions taken by EPE before, during, and after and any changes to handle future events as a result of those outages.

RESPONSE:

Unit	Date	Outage Duration	Outage Type	Reason for Outage	5-Day Weather Conditions					Actions Taken Before, During, and After/Changes Made
					Date Mean / Low Temperature (°F)	Date Mean / Low Temperature (°F)	Date Mean / Low Temperature (°F)	Date Mean / Low Temperature (°F)	Date Mean / Low Temperature (°F)	
Newman 4GT-1	01/08/97	9:51	Forced Outage	Frozen drum level and flow transmitter	01/06/97 33°F / 23°F	01/07/97 24°F/ 19°F	01/08/97 22°F / 12°F	01/09/97 30°F / 18°F	01/10/97 40°F / 30°F	No Computerized Maintenance Management System (CMMS) history prior to 2001, no records available
Newman 3	12/26/04	10:50	Forced Outage	Frozen gas flow transmitter caused low deviation main fuel trip	12/24/04 24°F / 17°F	12/25/04 32°F / 19°F	12/26/04 37°F / 23°F	12/27/04 44°F / 33°F	12/28/04 46°F / 34°F	Cannot locate records in the CMMS regarding this event. The worknotes indicate a Distributed Control System Power Failure happened sequentially, which prolonged the Outage.
Newman 2	12/08/05	14:03	Forced Outage	Frozen yarway (drum level) sensing line	12/06/05 39°F / 22°F	12/07/05 36°F / 23°F	12/08/05 27°F / 13°F	12/09/05 36°F / 20°F	12/10/05 40°F / 21°F	Drum level sensing line froze. During the event, additional heat lamps were supplied. After the event, the freeze protection check list was modified (in 2006) for this unit and this device.

ATTACHMENT V

Newman Plant Equipment Failures

NEWMAN Equipment Failures - Mechanical

Failed Quipment	Last Serviced
Copper Service Water leak - east safety shower supply valve	NA
Copper Service Water main water supply valve leak	NA
Instrument Air piping - 1 leak found and repaired	NA
Lake pump recirculation line leak	NA
Potable Water leak in 4" line inside building near U1	NA
RO/DI broken PVC line from lab to transfer pump	NA
RO/DI broken valve on demin water transfer pump	NA
RO/DI Service Water 100' line from DI to RO leaking	NA
Service Air Compressor failure	2010-10-13
Service Air isolation valves on U1 and U2 boilers burst QTY 5	NA
Service Water - 3 pipe blow outs (were isolated for later repair)	2010-01-12
Service Water 4" Gate valve near service water pump cracked	2008-07-22
Sump Piping 4" valves cracked and replaced - QTY 2	NA
Sump Piping 4" gate valves cracked and replaced - QTY 7	NA
Sump Pump 2A grounded	2008-05-08
U1 Bl-Color drain line and valve burst	2010-10-18
U1 Boiler Drain Piping Burst	2010-10-18
U1 Chemical Feed repiped and several valves replaced.	2010-01-07
U1 Circ Water broken nipple & vent valve on circulator	2010-01-26
U1 Clorine system piping broken	2010-10-28
U1 Service Water 4" Gate valve near FDF cracked	NA
U1 Service Water line to FDF and PH burst	NA
U1 Service Water supply to gravity feed tank burst	2010-10-28
U1 Transformer Delouge Piping burst	NA
U2 Chemical Feed repiped and several valves replaced.	NA
U2 Transformer Delouge Piping burst	NA
U3 Boiler Drum level indication instrument lines burst	2010-01-11
U3 Chemical Feed repiped, several valves and pump disc gauges replaced.	2009-02-16
U3 Clorine system piping broken	2010-10-28
U3 Service Water 60' line to chemical room safety shower burst	NA
U3 Service Water chemical room safety shower valve leaking/burst	NA
U3 Service Water to Vac Pump 6" chain valve cracked	NA
U3 Service Water to Vac Pump 6" check valve cracked	NA
U3 Transformer Delouge Piping burst	NA
U3 Vac Pump A Drain Valve broken	NA
U3 Vac Pump A Oil Cooler broken and leaking	2009-03-30
U3 Vac Pump A service water small leaks (multiple)	08/05/2010
U3 Vac Pump A service water valves broken (multiple)	08/05/2010
U3 Vac Pump B instrument air line burst	NA
U3 Vac Pump B service air line burst	NA
U4 Aux cooling nipple leaking at GT1 BFP VSD cooler return line	2010-02-27
U4 Aux Cooling Water Line - burst in ground	2010-02-27
U4 Clorine system severly damaged due to freeze	2010-10-29
U4 Fire Water House piping leaking (various)	2010-02-11
U4 GT1 Transformer Delouge Piping Burst	NA
U4 GT-2 Transformer Delouge Piping Burst	NA
U4 HRSG 1 - LP econ piping exterior to HRSG leaking	2009-04-21
U4 HRSG 1 Chemical Feed repiped and several valves replaced.	2007-02-24
U4 HRSG 2 - severe damage to LP economizer section of boiler	**2010-12-13**

U4 HRSG 2 Chemical Feed repiped and several valves replaced.	2009-01-07
U4 HRSG 1 BFP VSD Oil Cooler leak / replacement	2010-10-22
U4 Service Air - leak in drain pot of wet header to U4	2011-01-14
U4 ST steam trap found broken upon start up	2005-04-21
U4 ST Transformer Delouge Piping Burst	NA
ZLD PVC piping frozen and totally broken	-

Many items listed with a last serviced date of NA are equipment which does not require regular service or repair. For example due to their mechanical design and normally low rate of failure, our sump system gate valves do not require service or repair.

NEWMAN Equipment Failures due to Freeze - I & C

Failed Equipment	Last Serviced
U3 Air flow instrument lines froze/burst and transmitters failed	2006-01-03
U1 Boiler Drum level transmitters and instrument lines froze/burst	2010-05-11
U2 Boiler Drum level transmitters and instrument lines froze/burst	2010-05-10
U3 Boiler Drum level transmitters and instrument lines froze/burst	2009-09-02
U4 HRSG 1 Boiler Drum High Level Indication transmitter failed	2008-09-26
U4 HRSG 2 Boiler Drum High Level Indication transmitter failed	2010-03-30
U1 Boiler Drum pressure transmitters and instrument lines froze/burst	2005-11-01
U3 Boiler Drum pressure transmitters and instrument lines froze/burst	2002-04-15
U4 HRSG 2 Boiler Drum pressure transmitters and instrument lines froze/burst	NA
U4 HRSG 1 Boiler Drum pressure transmitters and instrument lines froze/burst	2010-11-04
U1 boiler drum electronic level indcator failed	2010-01-29
U3 boiler drum electronic level indcator failed	2008-10-08
U4 HRSG 2 boiler drum electronic level indcator failed	2010-01-20
U4 HRSG 1 boiler drum electronic level indcator failed	2010-04-23
U1 Bi-color drum level indication tubing frozen and burst	2010-10-18
U3 Bi-color drum level indication tubing frozen and burst	2010-05-27
U1 Boiler Feedwater flow transmitter and instrument lines froze/burst	2007-06-26
U3 Boiler Feedwater flow transmitter and instrument lines froze/burst	2005-12-06
U4 HRSG 1 Boiler Feedwater flow transmitter and instrument lines froze/burst	2009-06-04
U4 HRSG 2 Boiler Feedwater flow transmitter and instrument lines froze/burst	2009-04-04
U1 BFP Suction pressure instrument lines froze/burst and transmitters failed	2005-09-12
U3 BFP Suction pressure instrument lines froze/burst and transmitters failed	NA
U4 HRSG 1 BFP Suction pressure instrument lines froze/burst and transmitters failed	NA
U4 HRSG 2 BFP Suction pressure instrument lines froze/burst and transmitters failed	2010-01-28
U1 BFP Discharge pressure instrument lines froze/burst and transmitters failed	2006-03-06
U3 BFP Discharge pressure instrument lines froze/burst and transmitters failed	2006-11-21
U4 HRSG 1 BFP Discharge pressure instrument lines froze/burst and transmitters failed	2006-09-19
U4 HRSG 2 BFP Discharge pressure instrument lines froze/burst and transmitters failed	NA
U1 DEA Drum level transmitter and instrument lines froze/burst	2009-06-08
U3 DEA Drum level transmitter and instrument lines froze/burst	2008-12-04
U4 HRSG 2 DEA Drum level transmitter and instrument lines froze/burst	2004-11-06
U4 HRSG 1 DEA Drum level transmitter and instrument lines froze/burst	2005-04-05
U1 DEA sightglasses froze and broke	2007-02-13
U3 DEA sightglasses froze and broke	2010-11-09
U4 HRSG 1 DEA sightglasses froze and broke	2003-02-06
U4 HRSG 2 DEA sightglasses froze and broke	2002-06-18
U1 DEA pressure sensing instrument lines froze/burst and transmitters failed	2010-01-29
U3 DEA pressure sensing instrument lines froze/burst and transmitters failed	NA
U4 HRSG 1 DEA pressure sensing instrument lines froze/burst and transmitters failed	NA
U4 HRSG 2DEA pressure sensing instrument lines froze/burst and transmitters failed	2006-05-19
U1 Chemical sightglass froze and broke	2002-08-29

U3 Chemical sightglass froze and broke	NA
U4 HRSG 1 Chemical sightglass froze and broke	NA
U4 HRSG 2Chemical sightglass froze and broke	2003-05-30
U4 HRSG 1 Steam flow sensing lines ruptured due to freezing	NA
U4 HRSG 2 steam flow sensing lines ruptured due to freezing	NA
U1 ST Throttle pressure sensing line was frozen and ruptured	NA
U4 HRSG 1 BFP instrumentation and controls damaged	2005-05-18