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BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS
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KRISTIN K. MAYES

IN THE MATTER OF SERVICE QUALITY ISSUES, ANALYSIS OF TRANSMISSION ALTERNATIVES AND PROPOSED PLAN OF ACTION IN THE SANTA CRUZ ELECTRIC DIVISION OF CITIZENS UTILITIES COMPANY	DOCKET NO. E-01032A-99-0401 **NOTICE OF FILING SUPPLEMENTAL RESPONSE TO COMMISSION QUESTIONS AND UPDATED OUTAGE RESPONSE PLAN**

Tucson Electric Power Company and UNS Electric, Inc., through undersigned counsel, hereby file their Supplemental Information To Response to Commission Questions and Updated Outage Response Plan for Santa Cruz County.

RESPECTFULLY SUBMITTED this 30th day of April 2004

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TUCSON ELECTRIC POWER COMPANY
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SUPPLEMENTAL INFORMATION
TO
RESPONSE TO COMMISSION QUESTIONS
AND
UPDATED OUTAGE RESPONSE PLAN
FOR
SANTA CRUZ COUNTY

(Originally filed Feb. 9, 2004)

DECISION NO. 66615
DOCKET NO. E-01032A-99-0401

APRIL 30, 2004

MEMORANDUM

TO: Docket Control

FROM: Tucson Electric Power Company and UNS Electric, Inc.

DATE: April 30, 2004

RE: IN THE MATTER OF SERVICE QUALITY ISSUES, ANALYSIS OF TRANSMISSION ALTERNATIVES AND PROPOSED PLAN OF ACTION IN THE SANTA CRUZ ELECTRIC DIVISION OF CITIZENS UTITIES COMPANY
DOCKET NO. E-1032A-99-0401

Attached is supplemental information from Tucson Electric Power Company ("TEP") and UNS Electric, Inc ("UNS") (collectively referred to as ("Companies"), which augments and updates the Companies' February 9, 2004 Response to Commission Questions and Updated Outage Response Plan for Santa Cruz County.

Attachment: Original and thirteen copies

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EXHIBITS

I. PURPOSE OF REPORT

This Report supplements and augments Tucson Electric Power Company's ("TEP") and UNS Electric, Inc.'s (hereafter referred to collectively as the "Companies') February 9, 2004 Response to Commission Questions and the Updated Outage Response Plan for Santa Cruz County. The purpose of this report is three-fold:

1. It provides further information in response to Commission Questions posed in Decision No. 66615.
2. It provides the Companies' updates to the Outage Response Plan for Santa Cruz County that was filed on February 9, 2004.[1]
3. It provides the current status of the pending requests for approval from federal entities. These approvals are required before construction of the proposed transmission line from TEP's South Substation to the new TEP Gateway Substation and from Gateway Substation to UNS Electric's Valencia Substation in Nogales can commence.

II. BACKGROUND

In November 1999, the Commission issued Decision 62011. That Decision approved a Settlement Agreement that committed Citizens Utilities Company ("Citizens") to take action to rectify service problems in the Santa Cruz Electric Division. The Settlement Agreement required Citizens to build a second transmission line to service its customers in Santa Cruz County by December 31, 2003, and specifically required that any entity that acquired Citizen's Santa Cruz Electric Division would be required to fulfill the obligations for a second transmission line as a condition of the Commission's approval of the sale.

In July 2003, the Commission issued Decision No. 66028, which approved, among other things, the transfer of Citizens' Arizona Electric Division to UniSource Energy Corporation.[2] The new entity, UNS Electric, Inc., serves approximately 59,000 customers in Mohave County and 16,000 customers in Santa Cruz County. This filing addresses the integration of operations between TEP and the UNS Electric Santa Cruz service area.

In December 2003, the Commission issued Decision No. 66615, which addressed the Companies' request to delay the in-service deadline for the second transmission line or to waive penalties. In that Decision, the Commission retained the December 31, 2003 in-service date, but waived the $30,000 per month penalty until June 1, 2004,

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[1] An updated Black Start Process is attached as Exhibit A, which sets out the steps in the remote process. This process also describes the feeder priority for the restoration of service throughout the Santa Cruz service area. Also attached is the Loss and Restoration of the 115v Transmission Line Process (Exhibit B), which addresses both the switching process and restoration of transmission service.

[2] UniSource Energy Services ("UES") was formed as a holding company for the Citizens' properties. UNS Electric, Inc. and UNS Gas, Inc. are the UES subsidiaries.

finding that TEP and UNS Electric had made substantial efforts to construct the second transmission line by the in-service deadline, and that reasons for the delay were due to circumstances beyond the control of the Companies, primarily due to the federal permitting processes. As part of that Decision, the Commission ordered TEP and UNS Electric to respond to the following questions.

a. Can Citizens' operating procedures be improved to shorten the restoration time for transmission outage events utilizing TEP's operations center and field personnel?

b. Are any of the following improvements cost effective as interim restoration of service solutions to the construction of a second transmission line?

   i. A limited number of automated or remote controlled distribution feeder ties between substations.
   ii. Improved remote electronic dispatch control capability of the Valencia generator or improved generator controls.

c. What refinements are appropriate in Citizens' RAC-2 peak load forecast? Please define the annual hours of exposure when load is forecast to exceed the capacity of the existing transmission line.

d. Is the proposed interconnection with Mexico at the Gateway substation an interim service restoration solution for delay of the proposed South to Gateway transmission line through the Coronado National Forest?

e. How much emergency service is available from TEP via a Kantor feeder tied to TEP's 46 kV line?

On February 9, 2004, the Companies filed an initial Response to Commission Questions and Updated Outage Response Plan for Santa Cruz County. In the interim since filing that Response, the Companies have continued to analyze and implement changes that would improve reliability and provide additional customer benefits. On March 11, 2004, Staff filed a report that requested clarification on several issues. This Report provides clarification, as well as updates to the operational integration changes that have been implemented.

III. OPERATIONS INTEGRATION OVERVIEW

UNS Electric provides electric service to approximately 16,000 customers in Santa Cruz County. Because of its proximity to TEP's service territory, the Companies initially focused on the synergies that could develop in the Santa Cruz area to benefit customers. The Santa Cruz customers had experienced a number of electric outages

in the late nineties under the predecessor company. Because of this, reliability is a fundamental priority for UNS Electric and TEP.

Several enhancements are already in place, and the Companies continue to design and implement other enhancements to the Santa Cruz transmission and distribution system. These improvements are aimed at improving reliability, and in those circumstance where there is a power outage, to decrease the time necessary to restore service to customers. In addition, TEP also plans to utilize its control room personnel and computer systems to further enhance the value of these improvements. The following describes these enhancements.

a. Valencia Turbine Remote Start

UNS Electric has three 1970 vintage turbines located at the Valencia Substation in Nogales. These turbines are used to meet the majority of the load requirements during times when the 115 kV transmission line is out-of-service, during low voltage conditions and, in the future, will be used when the existing 115 kV transmission line is unable to support the total Santa Cruz load requirement.

Currently these turbines are started manually by Santa Cruz operating personnel. Occasionally there may be situations when UNS Electric operating personnel will not be immediately available to do a manual start. Under Citizens' ownership, it had occasionally taken up to forty-five minutes for an employee to arrive on site and perform the manual start. This circumstance would significantly affect the amount of time to restore electric service to customers.

The Companies have determined that the remedy is to implement remote start capability from TEP's control center in Tucson. TEP's generation system supervisor will have full authority and capability to adjust frequency, voltage regulation, fuel mixture and operating modes remotely. TEP utilizes Energy Management System (EMS), a software/hardware tool that controls the system by sending and receiving data to monitor and operate the generation and distribution system. TEP currently has the capability to remotely start seven combustion turbines (similar to the UNS Electric's Valencia turbines) at various locations within the Tucson area for a total generating capacity of 200 MWs. The EMS is physically located in the Irvington control room and can start up turbines at TEP's North Loop substation, the Irvington Power Plant and the DeMoss Petrie substation.

Having TEP manage the remote interface for the Santa Cruz service area will result in a shorter overall restoration time, thereby improving reliability and benefiting customers. The design phase for this project is complete and materials have been ordered. The anticipated in-service date for the remote operation of the Valencia turbines is May 2004. The associated cost for the design and implementation of this remote turbine start-up and operation capability for the Santa Cruz service territory is approximately $40,000.

The process to remotely start these turbines in black start mode is described in Exhibit A. This process also describes the feeder priority for the restoration of service throughout the Santa Cruz service area.

b. Distribution Capacitor Additions

In response to a Commission order[3] that required Citizens to file system improvement plans for the Santa Cruz service territory, Citizens hired Power Engineers, Inc. to develop a plan for the Santa Cruz District transmission system[4]. This plan indicated that capacitor banks at either Valencia or Sonoita substations would improve system voltages. The plan identified that the addition of 25 MVAR of capacitance at either Valencia or Sonoita would allow 65 to 70 MW of load to be served, while maintaining the planning criteria minimum voltage level of 0.95 per unit.

The Companies have reviewed the Power Engineers' report and, with additional study, have determined that installation of capacitors at various locations on the distribution system will correct the low voltage problems and provide enhanced benefits to capacitors located on the 115kV system.

TEP has completed the design work and the materials have been ordered for the capacitor installations. There will be approximately 25 shunt capacitors installed on feeders originating from the Valencia Substation, Sonoita Substation, Kantor Substation and the Canez Substation, for a total of approximately 24.6 MVARs. The approximate cost for the design and installation of these capacitors is $ 270,000. The scheduled date for completion of the project is June 1, 2004. The improvements in the voltage profile for the Santa Cruz transmission system, which will result from the addition of the capacitors, will reduce the number of hours that Valencia turbines would have to be operated for voltage improvement. Additionally the incorporation of these capacitors will allow the Companies to meet load levels up to the 70 MW level without having to run turbines, which adds additional value to this capital expenditure.

c. 46/115 kV Interconnection, Canoa (TEP) to Kantor (UNS Electric)

TEP has a 46 kV substation (Canoa) that is located approximately 5.5 miles from the UNS Electric Kantor Substation. If UNS Electric were to lose the 115kV transmission system north of Kantor, there is insufficient capacity at peak to serve the entire Santa Cruz load with the Valencia turbines. To remedy this situation, TEP plans to construct a 46kV emergency tie line from its Canoa Substation to the Kantor Substation. There is sufficient capacity at Canoa to interconnect and supply both the

[3] Decision No.64356, issued January 15, 2002.
[4] Santa Cruz District Transmission System Action Plan, dated June 2002.

Kantor and Canez Substations loading at peak, with the balance of the Santa Cruz load being served by the Valencia turbines. An electrical schematic of this interconnection is provided in Exhibit B.

However the use of this alternative is limited, because TEP is restricted by its two county financing to provide service only in the two counties it serves [Pima and Cochise Counties]. TEP's Engineering Certificate, setting forth certain covenants related to two-county financing, commits that in the absence of "Emergency Circumstances", all electricity from the local generating facilities will continue to be delivered exclusively to retail distribution customers in Pima and Cochise counties. For purposes of the Engineering Certificate, the terms "emergency" and "Emergency Circumstances" refer to "a temporary condition involving the forced outage or forced reduction in operating levels (or the imminent threat or danger thereof) of any electric transmission, distribution, generation, or related property of the Company or *of any other utility with which the Company is directly or indirectly interconnected*". As a result of the restrictions imposed by TEP's two county financing, this 46kV interconnection can only be used during emergency conditions.

The design work for this interconnection has been completed and the material has been ordered. Biological and archeological study work and the boundary survey work have also been completed. Because approximately 50% of the interconnection would be on state land, permitting remains an issue. Construction has begun on the portions of the project that are on private land. The State Land application and study work were submitted in April 2004[5] and expedited processing has been requested. The State Land Department must have approval from the State Historic Preservation Office before TEP will be granted a right-of-entry on state land.

The approximate cost of this interconnection is $1.9 million and the project will be in service as soon as permitting allows. Upon the completion of this interconnection, this interconnection, in conjunction with Valencia turbines UNS Electric will have sufficient backup capacity to restore service to Santa Cruz customers in the event of the loss of the 115kV transmission service[6]. The process to use this interconnection and restore load for any loss of the 115 kV transmission line is described in Exhibit C.

d. Remote Monitoring and Control of Santa Cruz Substations

Substations in the Santa Cruz area are monitored by the UNS Electric SCADA system, which is currently located in Kingman, Arizona. This is a small PC-based system, supported completely by a software vendor. The UNS Electric Kingman operation has a 24 hours-a-day dispatch function that monitors the Santa Cruz area.

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[5] State Land Department applications 18-109788 and 18-108123

[6] The need for this interconnection to restore service in the area depends on the locations of the loss of the 115kv line. The most critical segment for an outage is between the Nogales tap and Kantor substation

TEP's SCADA system is a Unix-based system purchased from Siemens Corporation. TEP has its own engineering support staff to maintain the system. The support staff is fully trained to repair hardware, software and provide on-call service on a 24 hour basis.

The substation Remote Terminal Units (RTU's) outputs that currently are communicated to Kingman dispatch are in the process of being transferred to TEP's Energy Management System. As part of this transfer, the existing RTUs are being upgraded. New RTUs have been installed at the Kantor, Valencia and Sonoita substations, and installation is expected to be completed by the end of April at the Canez substation. The benefits anticipated by this change include quicker response time and the elimination of vendor support for the day-to-day operation of the system. Improved response time arises from the authority of TEP's Distribution System Supervisor to operate the system. The TEP Distribution System Supervisor is NERC-certified and has authority to drop and restore load.[7] The expected time savings could be as much as 5 to 10 minutes to close a distribution feeder breaker and restore service (as compared to the Citizens' operation where the Kingman dispatcher did not have the ultimate decision making authority). The cost for this project is approximately $60,000 and the anticipated in-service date is May 2004.

e. Distribution Map Conversion and Outage Management

TEP's Outage Management System has the capability to predict and provide graphic representation of customer outages based on customer calls and the ability to trace back to a common point of failure. This system has helped TEP to manage distribution outages efficiently. The information provided allows TEP employees to better determine priorities, track outages and dispatch crews.

For geographic information systems ("GIS"), which are used for mapping, Santa Cruz operations have utilized AutoCAD, while TEP utilizes GE Smallworld software. TEP is in the process of converting the Santa Cruz distribution maps to Smallworld. For work management systems, Santa Cruz uses R&R Sytec, while TEP uses Worksuite STORMS. Santa Cruz will be converted to STORMS. TEP will also use its GE PowerOn outage management system for the Santa Cruz area. These conversions are labor intensive and TEP has contracted with a vendor to assist in the GIS data conversion. It is anticipated that this conversion will be completed in July 2004. The STORMS conversion is planned for completion by October 2004.

Once the GIS conversion is made, customer information from the Santa Cruz Orcom Customer Information System must be linked with the electronic distribution maps for the Santa Cruz service area for outage management. Again, this is a labor intensive undertaking, and will involve outside vendors, as well as internal TEP Information Technology personnel. The in-service date for the Outage Management

[7] This authority is required by existing reliability criteria.

System ("OMS") is expected to be December 2004. It is anticipated that there will be improvements in restoration time due to this conversion to the TEP OMS and the ability to manage outages from TEP's control room. The cost of these conversion efforts is approximately $300,000.

f. Request for Elimination of Spinning Reserve Requirement

As a result of long outages in the Santa Cruz area that occurred before UniSource's acquisition of the Citizens' Arizona electric operations, Santa Cruz personnel are required to operate the Valencia turbines in a spinning reserve standby mode during storms. The Companies believe that the projects described in this document will provide a significant benefit to improve the reliability in the area and reduce restoration time for transmission and distribution outages. As a result, the Companies are requesting that Staff reconsider its recommendation that the Valencia turbines be operated in standby (spinning reserve) mode during any periods that storms pose a threat.

In the three year period from 2001 through 2003, the Valencia turbines have been run in spinning reserve mode 133 times because of threat of storms. Only one of these periods coincided with the loss of the 115 kV line. The average length of time in spinning reserve was 4.5 hours per occurrence. This means that the turbines have operated at full speed for approximately 600 hours and have been utilized to recover from the loss of the 115 kV circuit only once. The estimated benefit of the 600 hours of spinning reserve status was a 20 minute reduction in the duration of a single outage. Operation of the turbines in a no-load mode results in the deterioration of the turbines. The turbines are subjected to the thermal stresses associated with start up and shutdown, regardless of if they are actually utilized to produce power.

In addition, while operating in standby mode, the turbines consume a significant amount of fuel and the engines do not completely burn the fuel. Full combustion would occur if the turbines were under full load. The incomplete fuel combustion results in a significant increase in CO emissions. The unloaded turbines emit approximately 1100 parts per million (ppm) CO, as compared to the 27 ppm emitted when the turbines are at full load. Although still in compliance with EPA mandates, when the turbines operate at full speed with no load, greater emissions result.

The Companies urge Staff to consider the reliability improvements that have been implemented and to weigh the effectiveness of those improvements as compared to the spinning reserve requirement. The Companies believe that the limited demonstrated benefit of this standby operation does not justify the costs (fuel consumption, loss of turbine engine life, turbine emissions) associated with this operation. Additionally upon completion of the addition of capacitors, loads up to 70 MW can be served adequately with the 115kV line alone. The Santa Cruz County load is not expected to reach this 70MW level until 2008. For these reasons, the

Companies request that the requirement that the turbines be in standby mode in stormy weather be terminated. In addition as part of this recommendation the Companies would suggest that the black start capability of the turbines be tested in accordance with Southwest Reserve Sharing Group (SRSG) requirements, as opposed to the monthly testing that now occurs

Additional information regarding the impacts of operating the Valencia turbines in spinning reserve mode can be found in Exhibit D.

V. SUPPLEMENTAL RESPONSE TO COMMISSION QUESTIONS

a. Can Citizens' operating procedures be improved to shorten the restoration time for transmission outage events utilizing TEP's operations center and field personnel?

Yes. The UNS Electric Santa Cruz electric operation has four substations located throughout Santa Cruz County: Valencia, Sonoita, Canez and Kantor. Valencia is the only substation that has personnel adjacent to the site (Monday through Friday, 7 am - 5 pm). As a result, one of the obstacles in manually restoring power after an outage is the time it takes for personnel to travel to these locations. Depending on the location, it can take an average of 20 to 45 minutes to reach these substations. The ability to take the necessary action from the TEP control center in Tucson, which has 24 hour coverage, will clearly alleviate this problem.

The table below compares the estimated time between manual operation and remote switching capability in restoring service after an outage. The table shows the timing differences at each of the Santa Cruz substations. The results indicate time savings that range from 30 minutes at Sonoita to 65 minutes at Valencia.

Of significance is the fact that all these locations can be remotely operated from TEP's control room simultaneously. To do a manual restoration with limited crew resources available, personnel would potentially have to travel from one site to another, in addition to performing the tasks necessary to restore the system, which would result in a cumulative time savings.

For example, without the remote capability, it would take more than 4 hours for all of the load to be restored, if the UNS Electric crewperson had to travel sequentially from Valencia (90 minutes) to Sonoita (40 minutes) to Canez (40 minutes) and finally to Kantor (55 minutes). With the ability to remotely operate, as the table indicates, it would take approximately 65 minutes to restore the load. Under this scenario, a savings of approximately three hours is realized.

Comparison of Manual Operation Times with Remote Operation Times

	Time /oper.	Quantity	Total time (Minutes)	Max Time Savings
Valencia (6 feeder breakers, 2 circuit switchers, 1 tie breaker)				
Manual Operation - Personnel on site (weekday)				
Dispatch person from office to Switchyard	5	1	5	
Communicate with dispatch / operate in accordance with direction	10	9	90	
	Total		**95**	
Manual Operation - Personnel not on site (eve., weekend)				
Dispatch person to Switchyard from off-site	20	1	20	**65 min.**
Communicate with dispatch / operate in accordance with direction	10	9	90	
	Total		**110**	
Remote Operation (TEP Control Room)				
Dispatcher operate switch	5	9	45	
	Total		**45**	
Sonoita 2 circuit switchers				
Manual Operation - Personnel not on site				
Dispatch person to Switchyard from off-site	20	1	20	
Communicate with dispatch / operate in accordance with direction	10	2	20	**30**
	Total		**40**	**min.**
Remote Operation (TEP Control Room)				
Dispatcher operate switch	5	2	10	
	Total		**10**	
Canez 1 circuit switcher				
Manual Operation - Personnel not on site				
Dispatch person to Switchyard from off-site	30	1	30	
Communicate with dispatch / operate in accordance with direction	10	1	10	**35**
	Total		**40**	**min.**
Remote Operation (TEP Control Room)				
Dispatcher operate switch	5	1	5	
	Total		**5**	
Kantor 1 circuit switcher				
Manual Operation - Personnel not on site				
Dispatch person to Switchyard from off-site	45	1	45	
Communicate with dispatch / operate in accordance with direction	10	1	10	**50**
	Total		**55**	**min.**
Remote Operation (TEP Control Room)				
Dispatcher operate switch	5	1	5	
	Total		5	

* **Note:** The above times are estimates; the times for manual operations will depend on weather, fault location, and availability of personnel.

b. Are any of the following improvements cost effective as interim restoration of service solutions to the construction of a second transmission line?

i. A limited number of automated or remote controlled distribution feeder ties between substations.

Many manually operated devices have been converted to remote operation capability. This remote capability will reside in the TEP Control room. In addition the Companies have the ability to remotely interconnect distribution feeders between Kantor, Canez, Sonoita and Valencia substations. These interconnections allow the load at these substations to be served by an adjacent substation. This remote switching capability and the new Canoa to Kantor interconnection allow TEP to switch in the event of 115kV faults or to do maintenance.

ii. Improved remote electronic dispatch control capability of the Valencia generators or improved generator controls.

The Companies have determined that significant time savings can be achieved by installing remote start-up capability at the Valencia turbine generators. To manually start the generators, if there is a crew available in the yard, it takes an average of 5 to 10 minutes to start the first generator. If there is no one in the yard, travel time of up to 45 minutes must be factored into the equation. The Companies have determined that the time savings do warrant the expenditure of approximately $40,000 in capital funds to implement these operational improvements and has started the implementation. It is anticipated that the operational capability will be achieved by May 2004. Please see UNS Electric's Black Start Remote Process for the Valencia generators, attached as Exhibit A.

c. What refinements are appropriate in Citizens' RAC-2 peak load forecast? Please define the annual hours of exposure when load is forecast to exceed the capacity of the existing transmission line.

One refinement to Citizens' RAC-2 peak load forecast was the reduction in the "high" forecast. This change to the forecast was made because the weather in Nogales during July 2003 was the hottest in ten years. There were 521 cooling degree-days in July 2003, compared to a ten-year average of 478 cooling degree-days. Actual peak and corresponding weather data for 2002 and 2003 were not available at the time that Citizens' RAC-2 forecast was developed. The UNS Electric "high" forecast for the Santa Cruz system incorporates the most recent peak and corresponding weather history and utilized actual load and weather data for the years 1999-2003. Also integrated into the UNS Electric peak forecast were a sales growth rate between 3% and 4% and a customer growth rate between 2.5 % and 3.0%. The forecasted growth rates were based on historic trends and future population projections.

The most recent data indicates a weather impact of .84MW per cooling degree-day on the Santa Cruz Electric peak. Utilization of this factor with extreme weather produces a "high" forecast of 64.4 MW for 2004. To obtain "high" peaks for the future years, forecasted customer and sales growth rates were applied to the 2004 "high" forecast.

Load duration estimates for number of hours when the load will exceed 60 MW and 67 MW are indicated in the table below.

Load	2004 Base	2005 Base	2006 Base	2007 Base
60	10	58	116	182
67	0	0	0	5

*Load Duration (# hours)

d. Is the proposed interconnection with Mexico at the Gateway substation an interim service restoration solution for delay of the proposed South to Gateway transmission line through the Coronado National Forest?

The proposed Gateway Project involves transporting 400 MW of power to or from Mexico. The Companies are still seeking federal permits to take the power to the Mexican border. The following addresses the legal and technical concerns involved with constructing an interconnection to Mexico to provide emergency restoration assistance.

Legal issues:

A Presidential Permit issued by the U.S. Department of Energy ("DOE") authorizing construction of the proposed Sahuarita-Nogales transmission line (i.e., the project currently under NEPA review by DOE and the other federal agencies) will provide most, but not all of the legal foundation TEP would need to construct a short transmission line that would merely interconnect the US and Mexican grids at Nogales. TEP would need to seek DOE approval to amend the Presidential Permit, and DOE would need to review the proposed amendment on environmental and system reliability grounds. DOE must determine that construction and maintenance of the proposed line is in the "public interest." This determination involves a two-step process: (1) a NEPA analysis documenting environmental impacts and (2) consideration of the effects of the proposed line on the operating reliability of the U.S. electric power supply system. Because this interconnection would not occupy Bureau of Land Management ("BLM"), United States Forest Service ("USFS"), or other federal land, TEP could proceed with construction of this interconnection before completion of the permitting processes by BLM and/or USFS for those parts of the Gateway Project that do cross federal land.

An independent Mexico interconnection would require interconnection with the electric system owned and operated by the Comisión Federal de Electricidad ("CFE"), the national electric utility of Mexico. CFE has agreed to allow interconnection with its system for the Gateway Project because the interconnection would allow for the cross-border trade of energy, thereby benefiting both TEP's and CFE's systems. It is questionable that CFE would agree to interconnect if the purpose was solely for emergency restoration for UNS Electric, because it would not provide CFE with any system benefits. For this reason, it is unclear whether the Companies would be able to secure the necessary business/contractual relationships to implement an interconnection as an interim solution to reliability issues in the Nogales area.

Technical Issues:

The construction of the proposed interconnection facilities to Mexico might help provide emergency restoration in the event of an outage of the existing 115 kV line. However, there are concerns about the capacity of the Mexican System in Nogales, Sonora. Sufficient capacity does exist in Santa Ana, but the necessary system upgrades to increase the capacity between Santa Ana and Nogales are cost prohibitive without the economic benefits of the proposed 345kV interconnection between CFE and UniSource. The Santa Ana station is approximately 60 miles from UNS Electric's facilities, and it would cost approximately $60 million for the construction of the necessary facilities to provide the proposed backup service. Another difficulty with this proposal is that the Nogales system is not synchronized with the Western Electric Coordinating Council ("WECC") grid, and as a result, UNS Electric would not be able to remain continuously interconnected with both systems. The UNS Electric system would have to be "dropped and picked" to move its service from WECC to CFE and back.

For emergency restoration of power utilizing an interconnection with Mexico, the Companies would need the involvement of the government of Mexico and CFE. The CFE would have to see merit in the proposed interconnection and build facilities to the proposed TEP interconnection at the border for the project to be successful.

e. How much emergency service is available from TEP via a Kantor feeder tied to TEP's 46 kV line?

The Canoa to Kantor 46kV interconnection, in conjunction with the Valencia turbines, will provide the necessary capacity to serve all UNS Electric Santa Cruz load independent of the 115kV transmission line through 2007. It will also provide a means for UNS Electric to restore load served from Kantor and Canez Substations simultaneously with and independent of the Valencia turbines and 115kV line. This interconnection would provide service restoration under circumstances that in the past would not have been possible. This interconnection will provide up to 20 MW of capacity to the Santa Cruz area. This, in combination with the 47 MW from Valencia turbines, will allow the Companies to meet Santa Cruz loads up to 67 MW. This level of load corresponds with the peak forecast for the Santa Cruz area in 2007.

The time necessary to restore service following a transmission line outage depends on the extent of the problem causing the outage, its location and the load levels. If the overall load level in the Santa Cruz area is less than 47 MW, the turbines at Valencia could be utilized to supply all the power needed, and the time necessary to restore service would only be the time involved in starting up the turbines. If load is greater than 47 MW, the length of time to restore service would depend on the specific circumstances.

For more discussion on this interconnection, see Section III(c) above.

VI. UPDATED OUTAGE RESPONSE PLAN

The Companies have updated the UNS Electric Processes (see Exhibits A and C) to reflect the operational improvements contemplated in the operational integration of UNS Electric facilities into TEP's operations center functions. The Processes include the possible utilization of 1) the proposed 46 kV emergency feeder tie to Kantor, 2) any automated or remote controlled switching devices, and 3) emergency switching when the Gateway interconnection to Mexico is implemented. The UNS Loss and Restoration of 115 kV Transmission Line process is attached as Exhibit C and the updated Power Plant Black Start Remote Process is attached to this report as Exhibit A.

VII. FEDERAL PERMITTING PROCESS

The Staff Report accurately described the process involved to obtain the necessary permits and approvals from the federal government. The following describes TEP's involvement in the process.

TEP has actively supported the federal review process since its inception in 2000. In an effort to facilitate this process, TEP has funded the following: (1) a contract engaging a DOE-approved contractor, Tetra Tech, Inc., responsible for preparing the Environmental Impact Statement ("EIS"); (2) a Project Coordinator for USFS, and other USFS costs associated with the development and preparation of an EIS; and (3) BLM costs associated with the development and preparation of an EIS. Excluding internal costs borne by TEP, TEP has already spent approximately $3 million to facilitate the federal review process. Moreover, additional funds have been requested by the various federal agencies and their contractors to complete the process.

In addition to bearing these financial costs, TEP has been and continues to be actively involved in assisting the federal agencies with the preparation of the EIS. Since 2002, TEP has repeatedly met with DOE, USFS, BLM and Tetra Tech to respond to factual questions, to clarify issues, and to resolve comments and language in the

draft EIS. TEP also timely submitted comments on the draft EIS during the public notice and comment period. TEP continues to respond to factual questions and concerns raised by the federal agencies in their efforts to complete the final EIS.

When it appeared that the federal review process was stalled, TEP initiated contact with the White House Task Force on Energy Project Streamlining ("Task Force") to assist in coordinating the federal agencies involved in the review process. On December 17, 2003, TEP provided the Task Force with an extensive memorandum discussing the background of the transmission line project and the federal review process, and requesting that the Task Force take the following actions:

- Facilitate the greatest possible degree of timely cooperation among the various federal agencies involved in evaluating the Sahuarita-Nogales Transmission Line project;

- Assist those federal agencies in resolving any questions or difference of perspective with the Commission; and

- Set and implement a deadline of May 1, 2004 for issuance of a final Record of Decision("ROD") on the transmission line EIS, issuance of RODs by the USFS and BLM on TEP's applications for special use permits, completion of the USIBWC review, and completion of consultation under ESA.

TEP has also met with representatives of the Task Force on several occasions. TEP continues to communicate regularly with the Task Force to keep the Task Force apprised of the status of the federal review process.

The federal agencies' NEPA review of the project is nearing completion, according to information from DOE and the Task Force. The projected date for release of the final EIS is in the July-August time period. The agencies have not committed to a firm deadline and there is some chance that release of the final EIS may be further delayed. The land management agencies have indicated that they will issue their decisions regarding TEP's applications for rights-of-way approximately one month after the EIS is released. The land management agencies have not indicated which route(s) will win their approval, if any, so there remains the possibility that the federal agencies will disagree among themselves as to the preferred route. There appear to be efforts underway at the behest of the Task Force to reconcile the agencies' different perspectives, and to expedite the decision making process, but TEP cannot predict whether those efforts will succeed.

VIII. CONCLUSION:

As this Report indicates, TEP and UNS Electric have made substantial enhancements to improve the reliability of the UNS Santa Cruz electric system. The Companies have made a considerable outlay of capital dollars, and have integrated

operations with UNS Electric. As a result of these improvements, there are significant time savings in restoring electric service after an outage.

For these reasons, the Companies are requesting that the requirement that the turbines be in standby mode in stormy weather be terminated and that the testing of the turbines be consistent with SRSG requirements. The Companies urge the Commission to consider the reliability improvements that have been implemented and to weigh the effectiveness of those improvements as compared to the standing reserve requirement. The Companies believe that the limited demonstrated benefit of this standby operation does not justify the costs of fuel consumption costs that will accrue to the customers, loss of turbine engine life, and emissions that are associated with this operation.

TEP and UNS Electric are committed to continued vigilance to ensure the reliability of their electrical systems. This report also validates the value of the new transmission project (Gateway Project) that TEP is attempting to permit at the federal level. That transmission line will further reduce the need for operation of turbines, thereby reducing both emissions and costs to customers. In regard to obtaining the necessary permits and approvals so the Gateway Project to Mexico can be constructed, the Companies continue to use all available avenues to resolve the outstanding permitting impediments.

EXHIBIT A

SANTA CRUZ DISTRICT

UniSourceEnergy SERVICES	Power Plant Black Start Remote Process	Issue Date 04/26/99	Revision Date	Page 1 of 1
		Approved: M. Flores		

Process

1. Initiate remote start on one (1) turbine.
2. Call substation crew to Valencia Substation.
3. Ensure all feeder breakers are open, bus tie breaker is closed, and 115kV high side circuit switchers are open remotely via SCADA at Valencia Substation.
4. Initiate remote start on 2nd turbine - approximately 5 minutes after 1st turbine starts.
5. Turbine bus breaker number 122 will automatically close to dead bus - approximately 15 minutes from Step 1.
6. Increase bus frequency remotely to 60.5 Hz .
7. Close breaker 6241 remotely to pick up turbine auxiliaries.
8. 2nd turbine will synchronize to 1st turbine and to feeder 6241.
9. Balance load and adjust frequency to 60.5 Hz.
10. If additional load is picked up by the turbines, frequency needs to be adjusted accordingly before feeder breakers are closed - see Note 1.
11. Remote start of the 3rd turbine will be initiated if it is required to pick up Sonoita Substation load.

Note 1: When turbine loading is 5MW, switch fuel to diesel and gas (50/50).
Note 2: The time from Step 1 to Step 9 is approximately 30 minutes.

Feeder Priority List

Valencia Substation	Sonoita Substation	Cañez Substation	Kantor Substation
6241	6207	8201	7201
6245	6204	8202	7202
6242	6203	8203	7203
6244	6206		
6243	6205		
6246			

Exhibit B
UNS Electric Inc.
Santa Cruz County System Overview

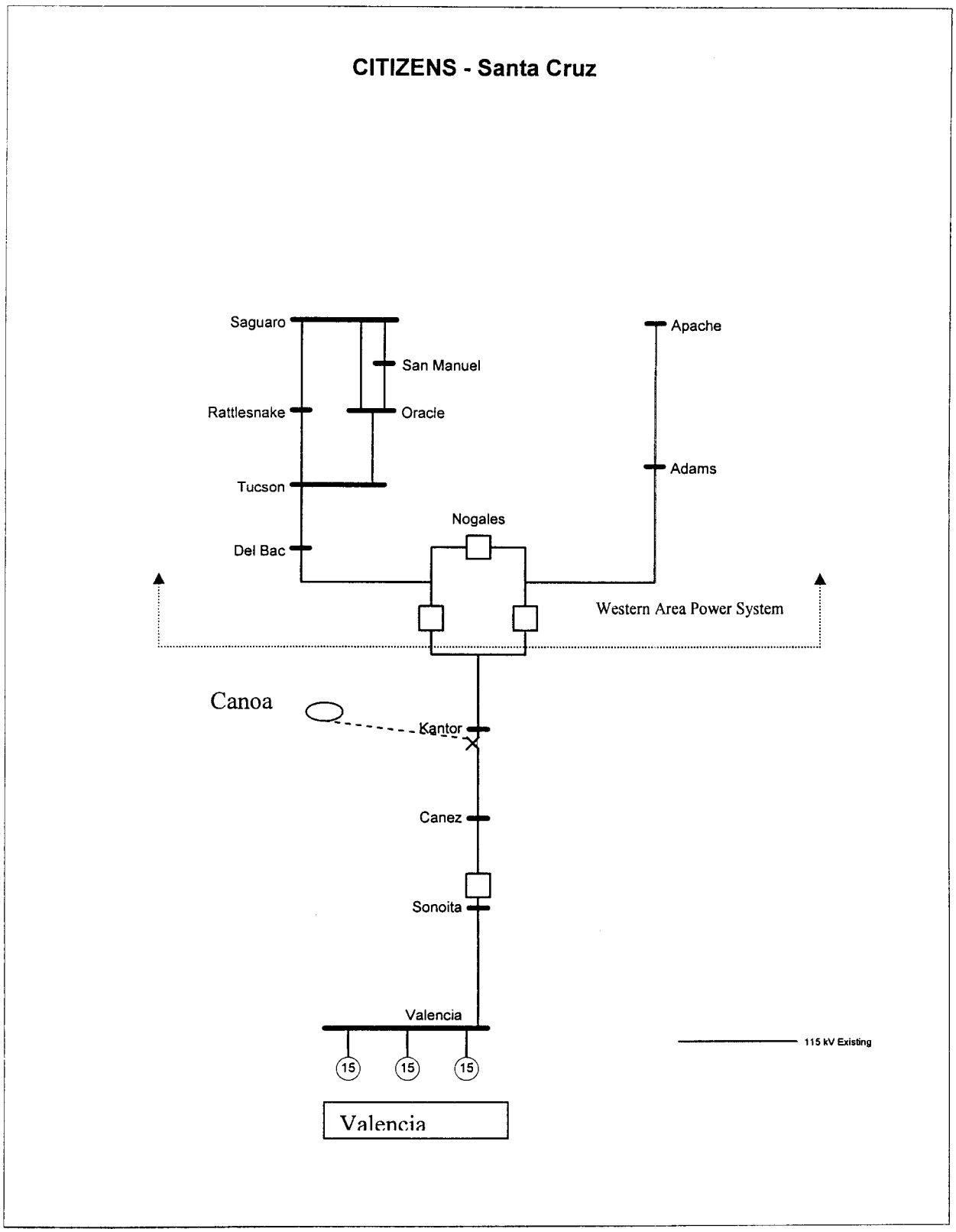
CITIZENS - Santa Cruz
Saguaro
San Manuel
Rattlesnake
Oracle
Tucson
Del Bac
Apache
Adams
Nogales
Western Area Power System
Canoa
Kantor
Canez
Sonoita
Valencia
15
15
15
115 kV Existing
Valencia

Exhibit C

UniSourceEnergy SERVICES	Loss and Restoration of 115kV Transmission Line	Issue Date 04/26/99	Revision Date	Page 1 of 1
		Approved: M. Flores		

Duties

Generation Systems Supervisor- Black start turbines per UES Power Plant Black Start Procedure (Remote).
Transmission Systems Supervisor - Restore 115kV, interconnect 46kV line to 115kV line, and coordinate with WALC.
Transmission Systems Supervisor will notify the Rocky Desert Reliability Coordinator (RDRC).
Distribution Systems Supervisor - Coordinate with Generation Systems Supervisor to pick-up distribution load and balance load with turbine generation.

Assumption

- Turbines are off and there is no ability to interrogate fault distance relay at the Nogales Tap Substation.
- When Valencia turbines are greater than 5MW per turbine each turbine will be switched to 50/50 fuel mix.

115kV Fault Location

Transmission - verify location of fault.

Scenario A: Fault north of Sonoita Substation - Nogales Tap Substation breakers will trip for the fault, de-energizing the 115kV line and the Sonoita Substation circuit switchers S115-CB2 and CB1 remain closed.

Scenario B: Fault south of Sonoita Substation - Nogales Tap Substation breakers remain closed and the Sonoita Substation circuit switcher S115-CB2 trips and de-energizes the 115kV line south of Sonoita Substation.

For either Scenario A or Scenario B, Generation Systems Supervisor will immediately refer to UES Power Plant Black Start Procedure (Remote) to begin restoring Valencia Substation load.

Scenario A

1. Send trouble/substation crew to Kantor Substation.

2. Transmissions Systems Supervisor coordinates with Distribution Systems Supervisor to remotely open distribution breakers and the 115kV breakers at Valencia Substation.

3. Transmissions System Supervisor will open Sonoita Substation circuit breaker S115-CB1 remotely.

4. Troubleman/Substation crew to verify whether fault is north or south of Kantor Substation by reading the fault indicators on K115-S2 at Kantor Substation.

   • If fault is north of Kantor Substation:

   a. Trouble/substation crew will open switch K115-S1 at Kantor Substation.
   b. Transmissions System Supervisor will close 46kV breaker K46-CB1 remotely. Kantor Substation and Cañez Substation load restored.

   • If fault is south of Kantor Substation:

   a. Trouble/substation crew will open switch K115-S2 at Kantor Substation.
   b. Transmission System Supervisor will close 46kV breaker K46-CB1 remotely. Kantor load restored.
   c. Transmission System Supervisor will open C115-CS1 at Cañez Substation remotely.
   d. Distribution System Supervisor will pick up Cañez Substation load through field switching (tie Kantor circuit 7201 to Cañez circuit 8203).

5. Transmission Systems Supervisor will open S115-CB2 at Sonoita Substation remotely.

6. Once the Valencia turbines are on line and feeding distribution circuits at Valencia Substation and the Generation Systems Supervisor is ready for additional load restoration, the Transmission System Supervisor will close V115-CS1 at Valencia Substation (this energizes the 115kV line between Sonoita and Valencia Substations).

7. Distribution Systems Supervisor will open all distribution feeder breakers, open S115-CS1 circuit switcher, and close the bus tie breaker at Sonoita Substation.

8. Transmission Systems Supervisor will close S115-CB2 at Sonoita Substation remotely (energizes T1 and distribution bus).

9. Distribution Systems Supervisor will coordinate with Generation Systems Supervisor while closing feeder breakers at Sonoita Substation to ensure generation and load balance.

Scenario B

Distribution Systems Supervisor will coordinate with Generation Systems Supervisor while closing feeder breakers at Valencia Substation to ensure generation and load balance.

Restoration of 115kV Line (fault cleared)

Scenario A

Assumption:
Valencia Substation and Sonoita Substation are on the Valencia turbines and TEP is carrying Kantor and Cañez Substation's load.

1. Transmission Systems Supervisor to ensure K115-S1 and K115-S2 are closed.
2. TEP and WALC will sync at the Nogales Tap.
3. Transmission Systems Supervisor will open 46kV breaker K46-CB1 remotely.
4. Transmission Systems Supervisor in coordination with WALC will sync at Sonoita Substation S115-CB1.

Scenario B

Assumption:
WALC is carrying Kantor, Cañez, and Sonoita Substation's and Valencia Substation is on the Valencia turbines.

1. Transmission Systems Supervisor will close V115-CS1 at Valencia Substation. (This energizes the 115kV line between Sonoita and Valencia Substations.)
2. Transmission Systems Supervisor in coordination with WALC will sync at Sonoita Substation S115-CB2

Exhibit D

UNS Electric, Inc.
Santa Cruz County Transmission Reliability
Analysis and Recommendations

Existing System

The UNS Electric Santa Cruz load is primarily served by a single 115kV circuit interconnected with the Western Area Power Administration's ("WAPA's") Nogales Tap Switchyard. The reliability of this circuit has historically been somewhat marginal. During the late 1990's, several extended outages resulted from storm damage and structural failures.

Three vintage simple cycle turbines are also located at Valencia Substation in Nogales. The heat rate and age[8] of these turbines is such that they are not economically competitive with remote generation resources. The Valencia Turbines are primarily utilized to provide a backup energy supply to Valencia and Sonoita Substations in the event of a loss of the 115kV transmission line. The turbines have been operated by a local operator.

Pre-UES Improvements

Citizens Utilities Company (CUC) made several improvements to the 115kV circuit prior to the UniSource acquisition. In 1999 CUC contracted a consultant to perform a structural inspection of the 115kV line. All high priority recommendations resulting from the inspections have been completed. In addition, in the fall of 2001 a project to improve circuit grounding and shielding from lightning strikes was completed. Table 1 illustrates the outage performance of the 115kV circuit through 2003.

Table 1 – 115kV Outages by Year

YEAR	NUMBER OF INTERRUPTIONS
1995	1
1996	6
1997	1
1998	5
1999	6
2000	4
2001	4
2002	**0**
2003	**1**

[8] The turbines were manufactured in 1970 and installed in Japan. They were refurbished in the United States in 1989 and subsequently installed at the Valencia plant.

The maintenance and upgrades to the 115kV line have resulted in a significant improvement in the reliability of the circuit.

UNS Electric Spring 2004 Projects

UNS is in the process of permitting a 46kV circuit from TEP's Canoa Substation near Green Valley to the UNS Electric Kantor Substation. This circuit will provide an additional backup source of energy for a portion of the Santa Cruz County load. This line will enable UNS Electric to quickly re-energize Kantor Substation and, depending on the fault location, Canez Substation following a loss of the 115kV circuit. An overview of the UNS 115kV system, the Valencia Turbines, and the proposed 46kV interconnection is set out in Exhibit B to the Companies' Updated Outage Response Report.

UNS Electric is also in the process of upgrading the controls on the Valencia Turbines to allow remote startup and synchronization of the units. This upgrade will accommodate a faster outage response.

Valencia Turbine Issues

The Valencia turbines do have black start capability. One turbine is started under simulated black start conditions each week, resulting in each turbine having been exercised at least once every three weeks. This testing regime helps to insure that the turbines will be available when needed. One disadvantage of such testing is that the turbine engine time between overhaul (TBO) is reduced by approximately 100 hours each time that the turbine is subjected to the thermal stresses associated with startup/shutdown, regardless of whether the turbine is actually utilized to produce electric power.

As part of ACC Docket No. E-01032B-98-0621, Citizens Utilities agreed to collaborate with the City of Nogales and to determine the initial order in which circuits are energized in the event of an outage on the Western Area Power Administration line or Citizens' 115kV sub-transmission line that required Citizens' gas fired turbines to be energized. The purpose of this collaboration was to ensure that the highest priority circuits (such as hospitals, utilities, and public services) come on-line first.

As a result of that collaboration, it was agreed that the Valencia Turbines should be kept in spinning reserve during any period that thunder storms were located within the vicinity of the 115kV transmission circuit. In this process, the turbines are started, but not synchronized to the Nogales electrical system.

For the years 2001, 2002, and 2003, the turbines have been run in spinning reserve 133 times because of the threat of storms. The average length of time in spinning reserve was 4.5 hours per occurrence. Thus, in the last three years, each of the three turbines has been operated a total of approximately 600 hours at full speed, with no load (FSNL) to meet the spinning reserve requirement.

Since the initiation of the spinning reserve requirement, the turbines have been utilized to recover from the loss of the 115kV circuit only once. The estimated benefit of having the turbines in spinning reserve status was a 20 minute reduction in the customer outage duration.

At FSNL, the turbines have a fuel consumption rate of 1400 SCFM natural gas or 9.2 GPM diesel. Due to the inefficient combustion that occurs at FSNL, the turbines emit almost 1100 ppm CO, versus the 27 ppm that would be emitted at full load.

In total, CUC and UNS Electric have burned the equivalent of almost 1,000,000 gallons of diesel fuel or 151,000,000 cubic feet of natural gas, emitted tons of additional CO emissions, and reduced the useful life of the Valencia turbines by about 42,000 hours due to the spinning reserve requirement.

It is anticipated that with the new UNS Electric systems and procedures in place, the benefit of placing the turbines in spinning reserve status will be reduced to a 15 minute reduction in the customer outage duration per occurrence. Upon weighing the loss of engine life, fuel consumption, and emissions that result from placing the turbines in "spinning reserve" with the minimal reliability benefit of the procedure, it is recommended that the Commission eliminate this requirement.