BEFORE THE
ARKANSAS PUBLIC SERVICE COMMISSION

IN THE MATTER OF THE APPLICATION OF ARKANSAS ELECTRIC COOPERATIVE CORPORATION FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE PURCHASE, OWNERSHIP, OPERATION AND MAINTENANCE OF THE WRIGHTSVILLE POWER FACILITY NEAR WRIGHTSVILLE, ARKANSAS	)))))))	**DOCKET NO. 05-042-U**

Public

Direct Testimony of

David A. Schlissel

Synapse Energy Economics, Inc.

On behalf of the

General Staff of the

Arkansas Public Service Commission

[CONFIDENTIAL MATERIALS REDACTED]

July 22, 2005

Q. Please state your name, position and business address.

A. My name is David A. Schlissel. I am a Senior Consultant at Synapse Energy Economics, Inc., 22 Pearl Street, Cambridge, MA 02139.

Q. On whose behalf are you testifying in this case?

A. I am testifying on behalf of the General Staff of the Arkansas Public Service Commission ("General Staff").

Q. Please describe Synapse Energy Economics.

A. Synapse Energy Economics ("Synapse") is a research and consulting firm specializing in energy and environmental issues, including electric generation, transmission and distribution system reliability, market power, electricity market prices, stranded costs, energy efficiency, renewable energy, environmental quality, and nuclear power.

Q. Mr. Schlissel, please summarize your educational background and recent work experience.

A. I graduated from the Massachusetts Institute of Technology in 1968 with a Bachelor of Science Degree in Engineering. In 1969, I received a Master of Science Degree in Engineering from Stanford University. In 1973, I received a Law Degree from Stanford University. In addition, I studied nuclear engineering at the Massachusetts Institute of Technology during the years 1983-1986.

Since 1983, I have been retained by governmental bodies, publicly-owned utilities, and private organizations in 24 states to prepare expert testimony and analyses on engineering and economic issues related to electric utilities. My recent clients have included the U.S. Department of Justice, the Staff of the Arizona Corporation Commission, cities and towns in Maine, Connecticut, and Illinois, and the Attorneys General of the States of New York and Rhode Island and the Commonwealth of Massachusetts.

I have testified before state regulatory commissions in California, Connecticut, Arizona, New Jersey, Kansas, Texas, New Mexico, New York, Vermont, North Carolina, South Carolina, Maine, Illinois, Indiana, Ohio, Massachusetts, Missouri, Rhode Island, and Wisconsin.

A copy of my current resume is attached as Exhibit DAS-1.

Q. Have you previously submitted testimony before this Commission?

A. Yes. I submitted testimony in Docket Nos. 98-065-U and 02-248-U in October 1998 and May 2003, respectively, addressing Entergy Arkansas, Inc.'s proposed replacement of the steam generators at the ANO Unit 1 and Unit 2 Steam Generating Stations.

Q. What is the purpose of your testimony in this proceeding?

A. The General Staff retained Larkin and Associates PLLC and Synapse to evaluate whether the Arkansas Public Service Commission ("Commission") should issue a Certificate of Public Convenience and Necessity ("CCN") for Arkansas Electric Cooperative Corporation's ("AECC") purchase, ownership, operation and maintenance of the Wrightsville Power Facility ("Wrightsville"). My testimony presents the results of this evaluation.

Q. Please generally describe the Wrightsville facility.

A. Wrightsville is a 548 MW combined cycle, gas-fired power generating station located in central Arkansas south of Little Rock in Pulaski County. Wrightsville was declared commercial on July 1, 2002, operated for approximately 15 months, and was deactivated and placed in extended cold storage in the summer of 2004. The facility has a unique 7x2 configuration (7 combustion turbines and 2 steam turbines) that is different from most 2x1 (2 combustion turbines and 1 steam turbine) combined cycle plants that have been constructed in this region. The facility was co-owned by Mirant (51%) and Kinder Morgan (49%) and is now in bankruptcy.

Q. Please explain how the General Staff conducted its investigation and analyses.

A. The General Staff's investigation included the following activities:

1. Reviewing the testimony and exhibits submitted by AECC in support of its request for a CCN;

2. Reviewing the answers, analyses, and documents provided by AECC in response to the more than 125 data requests[1] submitted by the General Staff;

3. Reviewing the testimony at FERC concerning the dispute between AECC and Entergy Arkansas, Inc. ("EAI" or "Entergy Arkansas") over the Power Coordination, Interchange and Transmission Service Agreement ("PCITSA");

4. Meeting with AECC staff to discuss the engineering and economic evaluations of the Wrightsville facility;

5. Investigating the current state of excess capacity in and around Arkansas; and,

6. Touring the Wrightsville facility.

Q. Please summarize your recommendations.

A. Based on the information reviewed, the General Staff recommends that the Commission should issue a CCN that would allow AECC to purchase the Wrightsville facility subject to the conditions listed below.

1. AECC should conduct an in-depth investigation into the operating performance of the two Kinder Morgan generating facilities similar in design to Wrightsville and the operating problems experienced at these units. AECC should then report in its rebuttal testimony as to whether any of the information discovered during this investigation changes its

[1] Data requests referred to in this testimony are included in Attachment No. 1 in the order that they are addressed in the testimony.

conclusion that purchasing and operating Wrightsville is the more economic option of the options reviewed.

2. AECC should commit to purchase "economy energy"[2] so as to minimize the overall cost of power to its members by displacing generation that would otherwise be attributed to Wrightsville.

3. AECC should present an analysis in its rebuttal testimony examining whether maintaining the facility in cold storage until its capacity is needed to meet required reserve margins would be a more economic option than the immediate reactivation of the Wrightsville facility from its current extended cold storage condition.

4. AECC should commit to undertake an integrated planning process that includes consideration of both supply-side and demand-side measures, renewable alternatives, and distributed generation facilities.

Q. What factors support the issuance of a CCN for AECC's purchase and ownership of the Wrightsville facility?

A. The testimony, exhibits, and supporting materials provided by AECC during discovery identify a number of factors which support the acquisition and ownership of the Wrightsville facility.

- The acquisition cost is below the cost of construction of an alternative facility.
- Interest rates are currently low. This means that there could be significant savings in securing long term financing for a capacity acquisition or construction before rates rise.
- AECC's feasibility studies, as modified to reflect concerns the General Staff raised during discovery, show that the acquisition of Wrightsville is the more economic option.

---

[2] Economy energy is purchased by one utility from another when it is more cost effective to buy energy than to generate it at one of the facilities on the purchasing utility's own system.

- Wrightsville has a better heat rate than AECC's current gas-fired generating units.
- The design of the Wrightsville facility enables it to be started and shut down frequently without incurring any additional maintenance costs.
- The facility already is connected to the electric grid, thereby avoiding the need for expensive transmission upgrades.
- The facility is connected to a large natural gas pipeline, and is near other potential alternative gas supply sources.
- The facility appears to be in good condition and to have been properly maintained during extended cold storage.[3]

Based upon my analysis, I agree that these factors are supportive of the issuance of a CCN for AECC's purchase of Wrightsville.

Q. Does the acquisition of Wrightsville produce an immediate positive result to AECC?

A. [REDACTED]

However, the net present value of the economic benefit is of sufficient magnitude to justify the issuance of a CCN for AECC's purchase of the Wrightsville facility.

Q. Do the economic analyses presented by AECC witness Lachowsky in his Direct Testimony reasonably represent the net present value benefit of acquiring the Wrightsville facility?

A. No. The economic analyses discussed by Mr. Lachowsky substantially overstate the net economic benefits that would result from AECC's acquisition and ownership of Wrightsville.

Q. Please explain.

A. AECC witness Lachowsky in his Exhibit AL-2, Table 1 presented the counter-intuitive result that the cumulative present value benefit of the Wrightsville facility, a gas-fired plant, would increase as natural gas prices increase. The General Staff further explored this result in discovery and learned the following from AECC.

In AECC's modeling of the acquisition of Wrightsville, AECC's facilities were dispatched, along with a small amount of purchased power, to meet AECC's loads. The General Staff learned that in AECC's modeling, the operational flexibility of the Wrightsville facility led to increased generation at AECC's coal-fired units in the scenarios with Wrightsville than in the scenarios with the alternative 2x1 combined cycle plant. This increased amount of low-cost coal-fired generation produced a substantial portion of the net present value of the economic benefit shown for the Wrightsville facility in Mr. Lachowsky's original economic feasibility studies.

Given the low cost of generating power at AECC's coal facilities and the fact that those facilities actually will be dispatched by Entergy Arkansas, it is more reasonable to expect that AECC's coal-fired facilities will generate the same amounts of power whether Wrightsville is acquired or a 2x1 combined cycle alternative is built. However, according to AECC's modeling more of this coal-fired generation would be used to serve AECC's own loads in the scenarios with Wrightsville than in the scenarios with the alternative 2x1 combined cycle facility.

This means that in the scenarios in which AECC built the 2x1 combined cycle alternative, there would be more coal-fired generation that AECC would be able to sell into the market. The sale of this additional coal-fired generation would

---

[3] The General Staff conducted a plant tour on June 28, 2005.

produce revenues in these scenarios that Mr. Lachowsky did not reflect in his studies.

Q. What impact do these additional revenues have on the cumulative present value benefit of acquiring the Wrightsville facility?

A. AECC's April 2005 revised study showed a cumulative present value benefit for Wrightsville of $172 million over 35 years.[4] This cumulative present value benefit [ ] when the comparison reflects the additional revenues that could be obtained by selling the excess coal-fired generation in the scenarios where AECC would build a 2x1 combined cycle facility instead of acquiring the Wrightsville facility.[5]

[REDACTED]

Q. Do you have any other concerns about the economic analyses conducted as part of AECC's feasibility study?

A. Yes. AECC has designated as its base case a scenario that reflects its Revised 2003 Power Requirements Study ("PRS") forecast. AECC's economic analyses should reflect its most current load forecast. This would be the Preliminary 2005 PRS load forecast. The use of this load forecast would reduce the cumulative present value benefit of acquiring the Wrightsville facility by approximately [REDACTED] over the base case scenario reflecting the Revised 2003 PRS load forecast.

AECC's base case scenarios should reflect, at least for the next five or ten years, the actual outage rates of AECC's generating units and not generic industry-average rates. At the General Staff's request, AECC modeled some of these scenarios to reflect the use of such plant-specific outage rates. However, the

---

[4] Direct Testimony of Andrew Lachowsky, at page 6, lines 19 - 20.

[5] Confidential Supplemental Answer to Data Request No. APSC 2-17. [REDACTED]

results changed only marginally when plant-specific rates were used in place of generic industry-averages, leaving sufficiently positive benefits to justify the acquisition of the Wrightsville facility.

Q. Are there any cost factors that AECC has not included in its economic analyses?

A. Yes. AECC's economic analyses exclude the costs of purchasing NOx allowances, the costs of the additional annual Continuous Emissions Monitoring System testing that might be required because the Wrightsville facility is not expected to operate regularly, (i.e., the plant may need to be fired-up to perform the testing, thereby incurring otherwise unnecessary fuel costs) and the additional revenues that AECC might earn from selling the excess output from a more efficient 2x1 combined cycle facility. However, these costs, in total, would not change the overall conclusion that acquiring and owning Wrightsville will produce a positive net economic benefit for AECC.

Q. Are there any design features of the Wrightsville facility that concern you?

A. Yes. The specific 7x2 design of the Wrightsville facility will result in heat rates that will be approximately 14 percent higher than the heat rates from a comparable 2x1 combined cycle facility. This higher heat rate will result in higher per MWh fuel costs and less generation at the facility than could be expected if Wrightsville had a more conventional 2x1 design. Thus, it is unlikely at any time in the foreseeable future that AECC will earn substantial revenues from selling significant amounts of excess power from the Wrightsville facility into the market.

In addition, the Wrightsville facility has six LM6000 combustion turbines, with relatively high NOx emission rates. Given the annual NOx emissions limits in Wrightsville's air permit, the relatively high emission rates of the LM6000

combustion turbines will limit Wrightsville to an annual capacity factor somewhere in the range of 40-45 percent, according to AECC.[6]

Q. Is it likely that the Wrightsville facility actually will operate at anywhere near a 40 to 45 percent annual capacity factor?

A. No. The Wrightsville facility almost certainly will not operate at anywhere near a 40 to 45 percent annual capacity factor given:

- The excess capacity that currently exists within the Entergy control area and is likely to continue to exist for a significant number of years.[7]
- The availability of lower cost generation from recently constructed gas-fired facilities with lower heat rates than Wrightsville.[8]
- The operational history of AECC's other gas-fired facilities. For example, AECC's Fitzhugh and Fulton units operated at less than 1 percent capacity factors in 2004.[9] AECC's McClellan and Bailey gas-fired units operated at less than 22 percent capacity factors in 2004.[10]
- The operational history of the Wrightsville facility during 2002 and 2003 before it was placed into extended cold storage.[11]

Q. Why are you recommending that the Commission's issuance of a CCN should be contingent on AECC reporting on the operational history and performance of other Kinder Morgan generating facilities?

A. The Kinder Morgan generating facility in Jackson, Michigan is an Orion plant, identical in design to the Wrightsville facility. The Kinder Morgan facility in Colorado is similar in design, but not identical, to Wrightsville.

---

6 AECC Response to Data Request No. APSC 2-27.

7 AECC Responses to Data Requests Nos. APSC 2-12 and APSC 2-34.

8 Direct Testimony of Andrew Lachowsky, at page 11, lines 13 - 19.

9 AECC Response to Data Request No. APSC 2-11.

10 Ibid.

11 Confidential AECC Response to Data Request No. 2-2.

AECC revealed during discovery that it only has a very limited knowledge of the actual operating performance of, and the actual equipment problems experienced at, each of these facilities as set out below:

- AECC does not have any information on the repair and maintenance history of the other Kinder Morgan plants.[12]
- AECC does not have any information on the actual annual forced outage rates experienced by the Kinder Morgan designed power plants in Colorado or Michigan.[13]
- The only information that AECC has about the Jackson, Michigan Orion plant's operational history and performance are the monthly generation and fuel consumption totals published by the U.S. Energy Information Administration.[14]
- The only documents that AECC could cite that discuss the operational history or performance of the Jackson, Michigan Orion were the very brief discussions provided on Kinder Morgan's website.[15]
- AECC has no assessments or evaluations of the operational history or performance of any other plants with the Kinder Morgan Orion design other than the cursory information provided on Kinder Morgan's website.[16]
- When asked to provide the name of the Colorado facility and to specify its operational history and performance, AECC replied that:

> Based on information on the Kinder Morgan Company's website … and discussions with Kinder Morgan's staff, AECC believed that the Fort Lupton [Colorado] plant owned by Kinder Morgan Power was built to the same Orion design used at Wrightsville, namely consisting of six LM-6000 aero derivative CTs, one GE 7EA frame type CT, and two steam turbines. However, this conflicts with official information available on the type of equipment at the Fort Lupton plant which AECC has obtained from other

---

[12] AECC Response to Data Request No. APSC 2-30.

[13] AECC Response to Data Request No. APSC 5-3.

[14] AECC Response to Data Request No. APSC 2-50.c.

[15] AECC Response to Data Request No. APSC 2-50.d.

[16] AECC Response to Data Request No. APSC 2-54.

> sources. According to the list of Electric Generating Units in the US, attached, the Fort Lupton plant does not have a frame type CT and has only five LM-6000 units. Except for the Jackson Power Facility in Michigan, AECC no longer believes nor can confirm that any plants of the Orion design used at Wrightsville have actually been built in Colorado or elsewhere.[17]

Finally, AECC indicated to the General Staff, during its plant tour and meeting, that AECC's staff has not visited the Jackson, Michigan Orion plant.

Q. Why is it important for AECC to be aware of and consider the operational history and performance of these other Kinder Morgan plants?

A. According to AECC, the Jackson, Michigan Orion plant is identical to the Wrightsville facility. Its operating performance and the equipment problems it has experienced, provides important information concerning, and insights into, the likely future operating availability, outage rates, maintenance needs, and operating costs of the Wrightsville facility. Similarly, although the Fort Lupton, Colorado plant may not be identical to the Wrightsville facility, it does have a similar design, and information concerning its operating performance and equipment problems also may shed some light on Wrightsville's likely operating availability, outage rates, maintenance needs, and operating costs. After all, AECC believed that the Fort Lupton plant was sufficiently similar to Wrightsville that its staff toured the plant.

Quite simply, AECC should investigate the operating histories and performance in order to assure the Commission, and itself, that there are no major design or equipment deficiencies that would cause the Wrightsville facility to have higher outage rates, a higher heat rate, or higher operating costs.

---

[17] AECC Response to Data Request No. APSC 2-53.a.

Q. Is the Wrightsville facility still under warranty?

A. [REDACTED] AECC should conduct an in-depth investigation of the operational histories and performance of similar Kinder Morgan designed generating units in order to identify whether there are any expensive repairs that AECC will have to fund.

Q. Does the operational history of the Wrightsville facility itself further support the need for AECC to investigate the operational histories and performance of the other Kinder Morgan designed units and to report this information before the Commission issues a CCN?

A. Yes. [REDACTED]

[REDACTED]

However, it still is possible that there are undiagnosed equipment deficiencies that could negatively impact the facility's future operations and costs. This is another reason why AECC should conduct an in-depth investigation into the operating histories and performance of the other Kinder Morgan designed generating facilities.

Q. Was AECC able to provide information on the monthly generation, availability, capacity factors, operating hours, forced outage rates, equivalent forced outage rates, and planned outage rates for each of the LM-6000 units and the 7EA unit at Wrightsville for each month since the facility was declared commercial?

A. No. AECC has said that it is not in possession of the documentation containing this information.[18]

Q. Please explain why you are recommending that the Commission condition its issuance of a CCN on a commitment by AECC to purchase economy energy so as to minimize the overall cost of power to its members by displacing generation that would otherwise be attributed to Wrightsville.

A. Under the PCITSA between AECC and Entergy Arkansas, Inc., AECC is billed by Entergy Arkansas for the energy provided to serve its load based on an after-the-fact hypothetical redispatch of AECC's resources. In this redispatch, AECC's resources are dispatched to serve AECC's load. The cost of the redispatch energy is based on the physical capabilities of AECC's resources, regardless of whether they were actually dispatched by Entergy Arkansas. The redispatch process reflects power purchases, including economy energy purchases made by AECC.

The Wrightsville facility will have a heat rate approximately 14 percent higher than the heat rates of conventional 2x1 combined cycle facilities. Because AECC and the operators of the other new combined cycle units in the region purchase fuel from essentially the same market, the inherent efficiency (i.e., heat rate) of the unit is the primary driver of energy cost differences between units. Therefore, the Wrightsville facility can be expected to have a higher fuel cost than a more conventional 2x1 combined cycle facility.

---

[18] AECC Response to Data Request No. APSC 5-17.

AECC has indicated that with the excess power in the region, the price of energy has rarely risen above the incremental cost of generation from 2x1 combined cycle units.[19] Therefore, AECC should be able to purchase energy from the market at a lower cost than the energy can be generated at the Wrightsville facility. Such purchases should be made as much as possible because they would displace power that might otherwise be attributed to the Wrightsville facility during the after-the-fact redispatch billing process and, therefore, would lower the cost of power being paid by AECC's member cooperatives.

Q. Has AECC provided any information indicating how many years the region can be expected to continue to have excess generating capacity?

A. AECC currently estimates that the reserve margin is 70.3 percent in the Entergy load control area.[20] This is substantially higher than the 13.6 percent reserve margin required by the Southwest Power Pool. This suggests that the region will continue to have substantial excess capacity for a significant number of years in the future.

Q. Has AECC stated when it would reactivate the Wrightsville facility from its extended cold storage if the Commission does issue a CCN?

A. Not precisely. AECC has said that it will bring the facility out of extended cold storage prior to the time when its capacity will be needed to meet AECC's required reserve margins.[21] According to AECC, it will not need significant capacity until 2009. AECC has stated that it has not determined whether the facility will be taken out of extended cold storage as soon as possible after it

---

[19] AECC Response to Data Request No. 4-18.

[20] AECC Response to Data Request No. APSC 2-12.

[21] AECC Response to Data Request No. APSC 1-14.d.

receives a CCN or if it will wait and bring the facility out of extended cold storage to be available for the summer of 2006.[22]

Q. Has AECC analyzed whether or not it is economic to reactivate the Wrightsville facility from extended cold storage prior to the time when its capacity is needed in 2009?

A. No. The General Staff recommends that AECC should undertake such an analysis and present its results to the Commission as part of its rebuttal testimony in this proceeding.

Q. Do you have any concerns about the planning process that AECC used to evaluate whether to acquire the Wrightsville facility?

A. Yes. AECC compared the acquisition of the Wrightsville facility to a number of fossil-fired self-build and purchased power options. However, AECC did not examine any demand-side or a broader range of supply-side options including renewable alternatives and long-term capacity and energy purchases. While such alternatives might not individually provide enough capacity or energy to replace Wrightsville, portfolios of demand-side measures and a broader range of supply-side alternatives may have been more economic than the purchase of Wrightsville over the long-term.

Because the net present value of the economic benefits are sufficient to justify the acquisition of the Wrightsville facility at this time, the Commission should not deny AECC a CCN in this docket due to this failure to consider demand-side and renewable alternatives. However, the General Staff recommends that AECC incorporate a more integrated approach in its planning for future needs.

---

[22] AECC Response to Data Request No. APSC 1-14.c.

Q. What are the steps in such an integrated planning process?

A. Broadly speaking, an integrated planning process should include the following steps.

1. The utility prepares load forecasts that represent its best estimate of the demand of generation, transmission, and distribution services in the long-term.

2. The utility considers opportunities to meet this demand through cost-effective demand-side measures.

3. The utility considers supply-side options including building power plants, purchases from the wholesale market, purchasing short-term and long-term forward energy contracts, purchasing derivatives as a hedge against risk, developing distributed generation, building or purchasing renewable resources, and expanding transmission and distribution facilities.

4. Finally, the utility develops the optimal portfolio that will achieve objectives identified both by the utility and regulators.

Regulatory, environmental, fuel availability, and cost uncertainties must be evaluated as part of the process of deciding whether to build or acquire new generating capacity. Consequently, as part of the planning process it is important to: (1) evaluate all possible demand-side options and supply-side resources; and, (2) start the planning process soon enough so that options to eliminate or defer capacity builds (such as energy efficiency measures) can be fully considered and deployed effectively and efficiently, if determined to be the most economic option.

Q. Have you seen any evidence that AECC currently performs such integrated resource planning?

A. No. AECC projects load every two years in its PRS. As part of those load forecasts, AECC reflects historical energy conservation plus its peak shaving and

interruptible rate programs.[23] But, it does not seem to move beyond the first step in the integrated planning process to examine whether there are other cost-effective energy efficiency programs that can be implemented to further reduce future load growth and to defer or eliminate the need for new generating capacity. For example, during the discovery process the General Staff learned that AECC has not performed any assessment since January 1, 2000 of "the technical and/or economic potential for energy efficiency investments [to serve] as an alternative to the construction or purchase of new generating capacity."[24] AECC has provided little evidence that it fully considers a broader range of supply-side options including renewable alternatives as part of its planning process.

Q. Should AECC follow a more formal and rigorous integrated planning process in planning for its future needs?

A. Yes. As a condition to the issuance of a CCN for the acquisition and ownership of the Wrightsville facility, AECC should commit to undertake an integrated planning process that includes consideration of demand-side measures, renewable alternatives, and distributed generation facilities. In planning for its future needs, AECC should develop an integrated resource plan that addresses:

a. when new capacity will be needed;

b. what type of load such capacity will need to serve (intermediate, baseload, and peaking);

c. the potential for a diverse range of supply and demand-side resources to serve that load;

d. the current and future risks of each supply and demand-side resource quantified to the extent possible; and,

---

[23] AECC Response to Data Request No. APSC 2-56.

[24] AECC Response to Data Request No. APSC 2-57.

e. modeling to show the revenue requirement effects of various resource portfolios judged by AECC to be most likely to serve its load at least cost and at least risk.

Q. Is the General Staff making any findings for ratemaking purposes concerning AECC's acquisition of the Wrightsville facility?

A. No.

Q. Does this complete your testimony?

A. Yes.