Exhibit No.:	
Issue:	Combustion Turbine Generator Configuration and Costs
Witness:	Matthew T. Wallace
Type of Exhibit:	Surrebuttal Testimony
Sponsoring Party:	Union Electric Company d/b/a AmerenUE
Case No.:	EO-2004-0108
Date Testimony Prepared:	March 1, 2004

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. EO-2004-0108

SURREBUTTAL TESTIMONY

OF

MATTHEW T. WALLACE

ON

BEHALF OF

UNION ELECTRIC COMPANY
d/b/a AmerenUE

St. Louis, Missouri
March 1, 2004

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Application of Union Electric Company d/b/a AmerenUE for an Order Authorizing the Sale, Transfer an Assignment of Certain Assets, Real Estate Leased Property, Easements and Contractual Agreements to Central Illinois Public Service Company d/b/a AmerenCIPS, and in Connection Therewith, Certain Other Related Transactions.	)))))))))	**Case No. EO-2004-0108**

AFFIDAVIT OF MATTHEW T. WALLACE

STATE OF MISSOURI)
) ss
CITY OF ST. LOUIS)

Matthew T. Wallace, being first duly sworn on his oath, states:

1. My name is Matthew T. Wallace. I work in St. Louis, Missouri, and I am employed by AmerenUE as Manager of Combustion Turbines.

2. Attached hereto and made a part hereof for all purposes is my Surrebuttal Testimony on behalf of Union Electric Company d/b/a AmerenUE consisting of 8 pages, all of which have been prepared in written form for introduction into evidence in the above-referenced docket.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct.

Matthew T. Wallace

Matthew T. Wallace

Subscribed and sworn to before me this 1st day of March, 2004.

Valerie W. Whitehead

Notary Public

My commission expires:

VALERIE W. WHITEHEAD
Notary Public - Notary Seal
STATE OF MISSOURI
Jefferson County
My Commission Expires: Dec. 10, 2006

SURREBUTTAL TESTIMONY

OF

MATTHEW T. WALLACE

UNION ELECTRIC COMPANY

d/b/a AmerenUE

CASE NO. EO-2004-0108

Q. Please state your name and business address.

A. My name is Matthew T. Wallace and my business address is Venice Power Plant, 701 Main Street, Venice, IL 62090.

Q. By whom are you employed and in what capacity?

A. I am employed by Union Electric Company d/b/a AmerenUE. My title is Combustion Turbine Generator ("CTG") Group Manager.

Q. Please describe AmerenUE.

A. AmerenUE provides electric service to over one (1) million customers and gas service to approximately 130,000 customers in Missouri. AmerenUE has approximately 62,000 electric and 18,000 gas customers in Illinois. Its principal service area is in Missouri.

Q. Please provide your educational and employment history.

A. I earned a bachelor's degree in Geological Engineering in 1980 and worked as a Geophysicist in the oil gas exploration industry for eight years. In 1990, I graduated from Washington University with a degree in Electrical Engineering and have been employed by AmerenUE since graduation. I started my career with

AmerenUE as an electrical engineer at the Labadie Power Plant. In 1994, I transferred to our central engineering division responsible for the design, development, and execution of large capital projects throughout the AmerenUE power plants. In 1996, I began work in the Ameren Services Energy Supply Operations Department when I was transferred to the position of Transmission Coordinator. In this capacity I was responsible for evaluating the transmission system, determining safe available transmission capacity and monitoring system security. In 1998, I was promoted to the position of Power Supply Supervisor in Energy Supply Operations, where I had overall system responsibility for the safe and efficient operation of the transmission system and economic dispatch of all Ameren generation capacity. In this position I was a NERC certified System Operator. In 2000, I was promoted to Labadie Power Plant Production Superintendent. My responsibilities included leading and directing the safe and efficient operation of the plant's maintenance department. In 2002, I was promoted to Venice Plant Manager. As Plant Manager, I was responsible for the plant's performance. Subsequent to the retirement of Venice Plant in 2003, I began my current position as the CTG Group Manager for AmerenUE.

Q. Please describe your duties and responsibilities as CTG Group Manager for AmerenUE.

A. My responsibilities are to cost effectively lead and direct the AmerenUE CTG group in order to maximize fleet reliability.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to explain the various CTG types and why AmerenUE can best meet its resource needs by using a mix of CTG types similar to those at the Pinckneyville and Kinmundy plants. I offer this testimony in response to the comments of Office of Public Counsel's witness Ryan Kind regarding the appropriateness of using these CTGs in AmerenUE's resource planning process. My testimony shows that the use of CTGs at the Kinmundy and Pinckneyville plants is appropriate for the purposes used by Mr. Voytas in this case.

Q. Why is the mix of CTGs at the Kinmundy and Pinckneyville plants representative of new CTG capacity that AmerenUE would build in meeting additional resource needs?

A. To answer that question one needs to understand the various types of CTGs. CTGs can be classed into three categories:

1. Aero-derivatives
2. Small frame
3. Large frame

Each of these types has different operational capabilities and cost structures. Each type of CTG performs a specialized function. Accordingly, depending on the fleet mix and particular system requirements, different CTGs are better suited for different tasks. AmerenUE has a need for all three types of CTGs. Machine type selection requires multiple criteria to be balanced as there is no single perfect machine. The Kinmundy and Pinckneyville plants have a mix of all three types of CTGs, as follows:

- Aero-derivatives – Pinckneyville Units 1-4, GE LM6000, 45 MW each
- Small frame – Pinckneyville Units 5-8, GE Frame 6B, 34 MW each
- Large frame – Kinmundy Units 1-2, SWPC Frame D5A, 117 MW each

Q. What characteristics and optional features of CTG plants vary from plant to plant?

A. There are a great number of equipment and site-specific characteristics and optional features that make every CTG project unique. CTG characteristics include type, capacity, minimum operating load, cycling capability, start cost, model, manufacturer, water requirements, variable operating and maintenance cost, and emissions. Site characteristics include transmission interconnection, gas supply, number of CTGs, land, and the air emission attainment status of the area in which the CTGs will be built. Optional features include dual fuel capability, black start capability, inlet air cooling, wet compression, and synchronous condensing capability. These characteristics and features have a significant impact on the capital cost of a CTG project.

Q. What are the operational advantages of aero-derivative CTGs?

A. **1. Fast start capability.** Aero-derivative machines are constructed such that they are perfectly suited for rapid starting and are unaffected by multi intraday cycling. These machines are made of light weight materials and are comparatively immune to thermal differential expansion. This design characteristic distinguishes aero-derivative CTGs from large frame units and to a lesser extent from small frame CTGs. Aero-derivatives reach full load in less than 10 minutes, which qualify them as "quick start" units. NERC requires all control area operators to have a minimum amount of quick start capacity to recover from sudden loss of large operating units.

2. Intraday cycling capability. Intraday cycling is another duty to which aero derivative machines are well suited. Two characteristics of winter peaking day conditions are common. First, typically during winter peaking operations load pick-up in the morning is abrupt. Ameren control area load increases in excess of 1,000 MW per hour are not uncommon. The second characteristic is the load drop during the middle of the day with a later increase to an evening peak. During times such as this, dispatching aero-derivatives makes sense. They can be rapidly synchronized and then removed once the load has settled.

3. Low heat rate. Aero-derivative machines have the lowest heat rate of the three types. Because fuel cost comprises most of the variable cost of operating a CTG, a lower heat rate translates into lower operating cost.

4. Low capacity. Aero-derivatives have low capacity ratings. This helps meet intraday or even intra-hour changing system load requirements in small incremental steps. This is done by staging multiple smaller units to hit the bus as load increases or removing units as load decreases throughout the day. Also, with the smaller aero-derivatives, a single contingency (the trip of an operating unit) does not cause as large a loss of generating capacity as it would with larger frame CTGs.

5. Low start cost. Due to the same design features that give aero-derivatives quick start capability, they have very low start costs. The number of starts has no significant impact on aero-derivative maintenance schedules and costs. With frame CTGs, however, the number of starts is the key determinant of maintenance schedules and costs. For example, a typical large frame start cost is $10,000, compared to a typical aero-derivative start cost of $500.

Q. What has been Ameren's operating experience with its aero-derivative CTGs vs. its large frame CTGs?

A. AmerenUE affiliates have included aero-derivatives in their power generation plant mix because of the advantages I outline above. The usefulness of these units is borne out by recent operational data. For the 2002-2003 period, the four Pinckneyville aero-derivative CTGs ran at a capacity factor of 5.2%, versus the 1.0% capacity factor of the eight large frame D5A CTGs operated by AmerenUE affiliates (Kinmundy, Gibson City, and Elgin). And the four Peno Creek aero-derivative CTGs ran at a capacity factor of 3.6% versus the 1% capacity factor of the D5A frame CTGs.

Q. What are the relative capital costs of the three types of CTGs?

A. The operational advantages of the aero-derivative machines come at a cost. The fully loaded capital cost of the aero-derivative GE LM6000 machine (there are four at Pinckneyville) is about $585/KW; that of the small frame GE machine (there are four at Pinckneyville) is about $465/KW; and that of the large frame SWPC D5A (there are two at Kinmundy) is about $435/KW.

Q. What capital cost figure did Mr. Kind cite in his rebuttal testimony?

A. Mr. Kind cited a cost of $390/KW, the rock-bottom overnight cost of a very large frame CTG – a 160 MW GE 7FA CTG. This is the lowest capital cost CTG that AmerenUE has modeled; all of the many other CTGs that AmerenUE has modeled in its asset mix optimization studies have higher capital costs. Note that the actual cost of a CTG plant based on GE 7FA technology is higher than $390/KW, after adding construction escalation and AFUDC costs.

Q. Is the $390/KW figure "closer to the range of figures for the cost of new gas-fired peaking plants" than the Kinmundy/Pinckneyville net book value of $471/KW?

A. No. It is below the bottom of the range of costs for various types of CTG plants. A mix of aero-derivatives, small frame and large frame CTGs is appropriate to meet AmerenUE's resource needs. Using just a $390/KW figure, which itself is low even for large frame CTGs, ignores the difference in costs associated with other CTG types and their operating benefits. Based on the above discussion, I conclude that the range of costs associated with CTGs that would be appropriate for use by AmerenUE to meets its resource needs is roughly $400/KW – $600/KW. The range is broad due to the great number of equipment and site-specific characteristics and optional features that make every CTG project unique.

Q. Why does AmerenUE prudently include a variety of CTG types in its least cost resource plan?

A. Resource planning decisions are driven by least cost planning balanced with the operational considerations. Large frame machines are the cheapest capacity to build yet are the least flexible to operate and have the highest O&M cycle costs. Aero-derivative machines are the most expensive to build but are the most flexible to operate and have the lowest O&M cycle costs. As noted previously, the system operational requirements dictate machine performances beyond just a single machine type. No one CTG type will suffice. Ultimately, AmerenUE has endeavored to execute this strategy. We have recently completed the commissioning of five aero-derivative machines and we are now in the process of building two large frame units.

Q. Please comment on the $471/KW figure utilized by Mr. Voytas in his testimony in this case.

A. Given the mix of CTG types involved, $471/KW, which is actually less than the midpoint of the range I discussed above, is a reasonable proxy for the cost of new gas fired capacity for AmerenUE.

Q. Does this conclude your testimony?

A. Yes, it does.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing has been sent to all parties of record this 1st day of March, 2004 by electronic mail (e-mail) or U.S. Mail.

/s/ Joseph H. Raybuck