BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI
SURREBUTTAL TESTIMONY OF GLENN P. KEEFE
ON BEHALF OF AQUILA, INC.
D/B/A AQUILA NETWORKS-MPS AND AQUILA NETWORKS-L&P
CASE NOS. ER-2004-0034 AND HR-2004-0024 (CONSOLIDATED)

Q. Please state your name and business address.

A. My name is Glenn P. Keefe. My business address is 10700 East 350 Highway, Kansas City, Missouri 64138.

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

A. I am employed by Aquila, Inc. ("Aquila") as Operating Vice President - Missouri Electric. I have responsibilities for the operation of the Aquila's regulated electric utility in Missouri. In Missouri, Aquila currently conducts its regulated utility business though its Missouri Public Service ("MPS") and its St. Joseph Light & Power ("L&P") operating divisions.

Q. Briefly describe your education and work experience.

A. In 1973 I received a Bachelor of Science degree in Mechanical Engineering from the University of Missouri – Rolla. After receiving my degree, I joined the Missouri Public Service Company, which later became UtiliCorp and recently Aquila, as Staff Engineer at the Sibley Generating Station. In 1974, I was promoted to Station Superintendent at the Ralph Green Generation Station in Pleasant Hill, Missouri. In 1976, I returned to the Sibley Generating Station as Operating Engineer. From 1979 through 1989, I served as Assistant Station Superintendent at the Sibley Generating Station and in 1989 was promoted to Station Superintendent. From 1997 through 2002, I have served as Vice President, Generation. As Vice President, Generation, I supervised the operation and

maintenance of 41 generating units at 15 different locations in Missouri, Kansas and Colorado. Since April of 2003, I have served in my present capacity as Operating Vice President – Missouri Electric. The 2002 re-organization of Aquila Networks from a function based focus to a State based focus eliminated my responsibilities of the Colorado and Kansas generating units. I retained the responsibility of the twenty-two Missouri generating units including our 18% ownership of the Iatan station operated by Kansas City Power & Light and Missouri's 8% share of the Jeffrey Energy Center operated by Westar Energy. My new duties also include the leadership of the Transmission and Distribution function in Missouri. My operating group is referenced as Missouri Electric ("MOE") and includes MPS and L&P (merger of L&P 12/31/00).

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

A. I am responding to the rebuttal testimony of Missouri Public Service Commission Staff ("Staff") witness Phillip K. Williams concerning current and potential future MPS rates following this rate case compared to the rates of other investor owned utilities in Missouri.

Q. What is the July 2002 and January 2003 MPS and L&P annual average rates $/KWh compared to other three investor owned utilities in Missouri?

A. From Mr. William's rebuttal testimony schedule 2-2, Aquila MPS and Aquila L&P have the lowest commercial and industrial rates in the state of Missouri. Aquila MPS commercial rates are 14% lower than KCP&L-MO, 21% lower than UE, and 24% lower than Empire. Aquila MPS industrial rates are 20.2% lower than UE, 27.6% lower than Empire, and 28.4 % lower than KCP&L. The following table reflects the comparison of

commercial and industrial rates for the five Missouri investor owned utilities identified by Mr. Williams:

Current Commercial Tariff Rates

	$/KWh	Ranking	Compare to MPS %
Aquila/P&L	0.0510	Lowest - 1	-16.1%
Aquila/MPS	0.0608	2	0.0%
KCP&L-MO	0.0694	3	+14.1%
UE	0.0735	4	+20.9%
Empire	0.0756	Highest - 5	+24.3%

Source: P.K. Williams Testimony

Current Industrial Tariff Rates

	$/KWh	Ranking	Compare to MPS %
Aquila/P&L	0.0404	Lowest - 1	-2.9%
Aquila/MPS	0.0416	2	0.0%
UE	0.0500	3	+20.2%
Empire	0.0531	4	+27.6%
KCP&L-MO	0.0534	Highest - 5	+28.4%

Source: P.K. Williams Testimony

Q. Aquila has extremely low rates for industrial and commercial customers but what about residential customers?

A. Mr. Williams points out on page 2, line 9-10 of his testimony that Aquila/MPS is in the middle of the five companies he analyzed for residential rates. This is true but it is important to acknowledge that these rates are only 1.7% higher than KCP&L-MO and less than 1 tenth of 1% higher than UE. In other words Aquila/MPS rates are approximately the same as UE and KCP&L. The following table reflects the comparison of residential rates for the five Missouri investor owned utilities identified by Mr. Williams.

Current Residential Tariff Rates

	$/KWh	Ranking	Compare to MPS %
Aquila/P&L	0.0653	Lowest - 1	-12.9%
KCP&L-MO	0.0737	2	-1.7%
UE	0.0749	3	-0.1%
Aquila/MPS	0.0750	4	0.0%
Empire	0.0795	Highest - 5	6.0%

Source: P.K. Williams Testimony

Q. Mr. Williams' purpose for rebuttal testimony was to respond to the direct testimony of Aquila, Inc. witness Mr. Keith Stamm, Aquila's Senior Vice President and Chief Operating Officer. At page 3, line 12, of Mr. Stamm's direct testimony he states, "while we believe that a $79.0 million revenue increase for the MPS electric operations is fully supported and justified, we also recognize that the impact on customers from a 23.4% increase would be significant. Therefore, Aquila senior management made the decision to mitigate the impact somewhat by having the Company absorb a portion (about $14 million) of the revenue deficiency." Do you agree with Mr. Stamm's statement that a $79.0 million revenue increase for the MPS electric operations is fully supported and justified?

A. Yes, there is much accounting data concerning revenue requirements for the Aquila/MPS case that is being discussed with the Staff and other parties. Sometimes this incredible detail hides some very basic concepts underlying the calculation of revenue requirements based on the specific and total electrical system analyzed. My approach is to view the electrical system specific to MPS and compare the total system revenue requirements rates to other Missouri electric utilities. The Missouri Public Service Commission

("Commission") will pour over all the details of the case but the key question to be answered is "Based on the total costs of operating the electrical system, what are justifiable rates for the various customer classes?"

Q. What do you mean: "Based on the total electrical system"?

A. Each electrical system whether it be Aquila/L&P, Aquila/MPS, UE, KCP&L, or Empire has various specific characteristics that will affect the revenue required to support a reasonable return. The key specific characteristics that could be used in analyzing the Efficiency and Effectiveness of a utility system are as follows:

1. System Load Factor
2. Customer Density
3. Customers per Employee
4. Transmission / Distribution Pole Miles per customer
5. Generation system characteristics mix
6. Economies of Scale

Q. Have you looked at these factors to analyze your system?

A. One of the questions that I asked when we reorganized to a State based organization, was "How can our rates be approximately the same as KCP&L and UE for residential rates and the lowest in the State in overall average rates considering that Aquila/MPS and L&P have the lowest load factors compared to other utilities serving customers in Missouri?" The basic concept is that electric utilities with higher load factors have more energy sales to spread cost of service over, thereby lowering average residential, commercial, industrial and other rates. When analyzing any system and required revenues, the efficiency and effectiveness are important factors. It appeared that our system was very

efficient; however, our first directive from upper management is to look at the effectiveness of the system as viewed by customer service concerns.

Q. What is the Efficiency and Effectiveness of the system?

A. I define the total electric system as the customer base, operating employees and the infrastructure and equipment required to deliver the power to our customers on demand with extremely high reliability and safety. Effectiveness is a measure of the degree to which the utility meets or exceeds customer demand reliably and safely. Efficiency is a measure of the amount and cost of resources consumed in achieving Effectiveness, which is generally measured by inputs relative to outputs. Companies must focus on the Effectiveness of customer service but deliver this service in an efficient manner. The cost of being totally focused on Effectiveness without Efficiency will result in costly service and high rates. Some utility systems are very Effective but not Efficient, while some deliver high Efficiency at the expense of poor service. Most try to deliver a prudent balance between cost and service. Every utility system has specific constraints defined by its service territory. Even if you are extremely efficient, these constraints cannot be totally overcome and, absent an adequate rate structure, the Effectiveness will degrade, suffer and/or the finances of return to the utility will erode compared to other utility systems in the State. The Commission will decide what rates are just and prudent for a defined system. Demonstrated delivery of a high level of Efficiency and Effectiveness should result in a rate structure that provides an opportunity for the high return. Please refer to Keith Stamm direct testimony, pages 14-16, that describes the methods Aquila uses to measure and track Efficiency and Effectiveness of its Missouri utility operations.

Q. How does Aquila/MPS system compare to other investor utilities in the state?

A. The balance between Effectiveness and Efficiency is always difficult. Aquila/MPS and Aquila/L&P together are viewed as Aquila/Missouri Electric (Aquila/MOE). Aquila/MOE has a very large service territory of 13,334 square miles for its 286,000 customers. This results in a customer density of 21.4 customers per square mile. The lower the customer density of an electrical system, the higher the cost to serve the system. The time and cost for meter reading, utility hookups, service restoration, , vehicle transmit, wires and poles, line losses, generation resources, communications and data collection/monitoring, all increase with a lower customer density. If these costs are not properly incorporated in rates, Effective service will be difficult to maintain as the utility's margin decreases. A low customer density results in higher cost of service. Absent adequate revenue to support the high cost of service, Efficiency and Effectiveness must degrade as costs are cut in an attempt to maintain a reasonable return on investment. Comparison of Aquila/MOE with other utilities in the state is shown in the table below:

Operational System Considerations Aquila/MOE

	Territory Sq. Miles	Employees	Customers	Customer Per Sq. Mi.	Sq. Miles Per Employee	Customer Per Employee	Difference Customer Per Employee
Aquila/MOE MO	13,334	785	286,000	21.4	17.0	364.3	0.0%
KCP&L MO/KS	4,221	2,200	485,000	114.9	1.9	220.5	-39.5%
Ameren MO/IL	44,500	7,400	1,800,000	40.4	6.0	243.2	-33.2%
Empire MO/KS/AR/OK	10,000	792	154,170	15.4	12.6	194.7	-46.6%

Source: FERC DATA 2002; 10K's; Annual Reports

The table indicates that Aquila/MOE "customers density" (customers per square mile) is second lowest of the investor owned utilities in the state. The customer density of Aquila/MOE is all in Missouri where KCP&L, Ameren, and Empire have service territory in other states. The customer count for Ameren also includes 1.5 million electric

customers and .3 million-gas customers. The amount of contract work for each utility, which affects the "customers per employee" is unknown with data reviewed.

Q. What are other characteristics of a total electric system that requires rates to be higher?

A. A low customer density and the type of customers affects a system's load factor. Aquila/MOE has a very low load factor compared to other utilities in Missouri (defined as the ratio of peak load to average load). Load Factor, as defined by the North American Electric Reliability Council, is a measure of the degree of uniformity of demand over a period of time, usually one year, equivalent to the ratio of average demand to peak demand expressed as a percentage. It is calculated by dividing the total energy provided by a system during the period by the product of the peak demand during the period and the number of hours in the period. A lower load factor for a system will require a different portfolio or mix of supply resources . For example, a system with a low load factor would require more combustion turbines or short-term purchase power contracts to meet peak load. A lower load factor for any system whether it be an airline or an electrical system increases cost of service. In 2003, Aquila/MPS had a load factor of 45.6%. The following comparison to other electric systems is based on 2002 FERC data. The FERC data represents the combined service territories for the utilities identified. During 2002, Aquila/MPS had a very low load factor of 48.9% resulting from more residential load and less industrial and commercial load than any other utility in the State. Aquila/MOE had the lowest load factor of all the systems reviewed. The table below indicates 2002 FERC data allowing load factor comparisons, among Missouri utilities including other Aquila service territories :

Aquila System - Electric

	System Load Factor	Compare to MPS %	Difference Load Factor
Aquila/MPS	48.9	0.0%	0.0
Aquila/L&P	55.4	+13.3%	+6.5
Aquila/KS	54.6	+11.7%	+5.7
Aquila/CO	62.9	+28.6%	+14.0
Aquila/MO,KS,CO	51.8	+5.9%	+2.9
Ameren MO,IL	68.5	+40.1%	+19.6
KCP&L MO,KS	51.2	+4.7%	+2.3
Empire	56.6	+15.7%	+7.7

Source: FERC 2002

Q. What is the cost for a low load factor?

A. Based on system load factor, all other factors being the same, Aquila/MPS load factor of 48.9 % should require the highest rates of all utilities in the table above. Based on the FERC 2002 data, Ameren's load factor of 68.5 % is 19.6 % higher than Aquila/MPS. KCP&L's load factor of 51.2 % is 2.3 % higher than Aquila/MPS, and Empire's load factor of 56.6 % is 7.7 % higher than Aquila/MPS. To illustrate the importance of load factor to the economic health of an electrical system, a hypothetical illustration was completed for Aquila/MPS based on the 2003 budget. The desired effect was to calculate the increase in revenue, cost of sales, gross margin and return on equity (ROE) for every 1% increase in load factor. It was assumed that average generation/purchase energy cost of sales would remain constant per MWh, since any increase in energy sales due to higher system load factor would be served proportionately by existing Aquila/MPS generation/purchased energy resources. The results of this hypothetical illustration indicated that for a 1 % increase in load factor for Aquila/MPS from 49.7 % to 50.7 %, an increase in ROE of about 0.8 % ($2,893,000 in net income) would occur. This simple model allows us to estimate the value of load factor to the Aquila/MPS electrical system.

If Aquila/MPS had an increased load factor of 5 % from 49.7 % to 54.7 %, then the increase in ROE would be increased 4.1 % and corresponding net income increased to $14,466,000. Since the electrical system at Aquila/MPS does not have a higher load factor, the cost of service must be recovered with higher revenue and rates to earn a fair and reasonable ROE to serve customers with a reasonable level of reliability. The following table shows a hypothetical illustration of a 1 % improvement in load factor for Aquila/MPS and other Aquila regulated electric utilities under existing rates:

Aquila Networks
2003 ROE Impact Analysis - Hypothetical Illustration
Regulated Electric Utilities
Case B: LF+1.0%_Budget 2003 -- 1.0% increase in Load Factor

		A	B	C	D
2003	Units	**MpsE-Mo**	**SjdE-Mo**	**WpcE-Co**	**WpkE-Ks**
Peak Demand	MW	1,305	400	334	561
Change Load Factor	**%**	**1.0%**	**1.0%**	**1.0%**	**1.0%**
Load Factor	%	50.7%	57.5%	64.6%	55.4%
Change Sales	**%**	**2.0%**	**1.8%**	**1.6%**	**1.8%**
Change Sales	MWh	106,513	31,975	27,190	43,599
Change Revenue/Margin	$000	4,255	1,140	1,097	1,491
Change Net Income	$000	2,893	775	746	1,014
Equity	$000	349,024	85,776	58,574	87,532
ROE	%	8.3%	4.2%	10.4%	8.6%
Change ROE	**%**	**0.8%**	**0.9%**	**1.3%**	**1.2%**

Q. Have you looked at other companies in regards to generation portfolios?

A. Yes. The size of the system also has a relationship to overall cost. As the size of the system decreases, the cost of service on a per MWh basis increases, since power resources are required to provide base load, intermediate load, peaking load and reserve capacity in excess of peak load based on the reliability requirements for the utility. The type of generating units installed in a system determines the capital and operating costs. Nuclear units have the highest capital cost per kW installed, followed by coal units, gas-

fired combined cycle units and combustion turbines. If a generator is too large for the system, the capital cost will produce higher rates in order to recover costs. If the generator is smaller and less efficient, the operating cost will increase requiring higher rates. An example would be a system that is large enough to allow a plant in the size range of 2,400 MW such as Ameren's Labadie plant consisting of four 600 MW coal fired generating units. Aquila's largest owned and operated plant is the Sibley Generating Station consisting of three generating units at approximate capacities of 50 MW – Unit 1, 50 MW – Unit 2, and 390 MW – Unit 3. The economies of scale and lower net heat rates (more efficient in BTU/kWh) for larger units allows much lower operating and maintenance cost per MWh produced. Even with Sibley's excellent operating indices of availability and forced outage rate, it is difficult to achieve the overall operating and maintenance cost of the much larger units. Economy of scale is an important factor in overall system cost. Larger utilities with a denser customer base and higher load factor can achieve lower cost structures by utilizing large nuclear or coal plants such as Ameren and Great Plains Energy (KCP&L). These different fuel types are a great benefit during times when purchase power and gas prices are extremely volatile and expensive. Aquila/MOE and Empire are at a cost disadvantage due to lack of economies of scale. An example of four companies that do business in Missouri and their respective generation mix were extracted from FERC data. The following tables show 2002 FERC data generation for Ameren , Aquila, Empire, and KCP&L including the various types of units (generation mix), relative size of units, and generation capacity factors of overall systems:

Ameren MO, IL

	Capacity Factor	MW Capacity	HRs/Yr	MWh	Percent Generation	% of Total Energy
Coal	0.6504	9220	8760	52,530,987	82.58%	
Nuk	0.8242	1162	8760	8,389,631	13.19%	
Gas	0.0655	2630	8760	1,508,984	2.37%	
Oil	0.007	473	8760	28,974	0.05%	
Hydro	0.1617	813	8760	1,151,608	1.81%	
Total Generated				63,610,183	100.00%	67.5%
Purchases				30,574,088		32.5%
Total Energy				94,184,271		100.0%
Total Owned CF	0.5079					

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Aquila MO,KS,CO

	Capacity Factor	MW Capacity	HRs/Yr	MWh	Percent Generation	% of Total Energy
Coal	0.6713	1183.3	8760	6,958,500	90.73%	
Nuk		0	8760	-	0.00%	
Gas	0.0818	968.1	8760	693,709	9.05%	
Oil	0.0373	51.6	8760	16,860	0.22%	
Hydro		0	8760	-	0.00%	
Total Generated				7,669,069	100.00%	59.0%
Purchases				5,326,793		41.0%
Total Energy				12,995,862		100.0%
Total Owned CF	0.4121					

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Empire AR,KS,MO,OK

	CF	MW	HRs/Yr	MWh	Percent Generation	% of Total Energy
Coal	0.5839	385	8760	1,969,261	71.34%	
Nuk		0	8760	-	0.00%	
Gas	0.1245	725.3	8760	791,027	28.66%	
Oil		0	8760	-	0.00%	
Hydro	0.3061	20	8760	-	0.00%	
Total Generated				2,760,288	100.00%	52.3%
Purchases				2,520,421		47.7%
Total Energy				5,280,709		100.0%
Total Owned CF	0.2559					

KCP&L MO,KS

	Capacity Factor	MW Capacity	HRs/Yr	MWh	Percent Generation	% of Total Energy
Coal	0.7579	2136	8760	14,181,340	75.37%	
Nuk	0.882	550	8760	4,249,476	22.58%	
Gas	0.0834	508	8760	371,137	1.97%	
Oil	0.0035	460	8760	14,104	0.07%	
Hydro		0	8760	-	0.00%	
Total Generated				18,816,056	100.00%	95.1%
Purchases				974,351		4.9%
Total Energy				19,790,407		100.0%
Total Owned CF	0.5878					

Q. What type of generation mix do the various systems have?

A. Units fired by oil and gas have the most expensive fuel cost in $/MWh and are found in smaller systems with a low load factor due to peaking requirements and generally smaller customer base. Hydro, nuclear and coal are the least expensive in fuel cost and are usually found with larger systems with greater load factors and a larger customer base. This is because a higher load factor system with a larger customer base can efficiently utilize more base load generating capacity and energy than a lower load factor system. Ameren has 78.3 % of total capacity consisting of hydro, nuclear, and coal. Ameren has the largest amount of hydro in the state at 813 MW. KCP&L has 73.5 % of total capacity in nuclear and coal. Aquila has 53.7 % of total capacity in coal. Empire has 35.8 % of total capacity in hydro and coal. KCP&L data indicates that they purchased only 4.9 % of total energy (KCP&L system load factor 51.2 %). Ameren purchased 32.5 % of total energy delivered to the system (Ameren system load factor 68.5%). Aquila purchased 41.0 % of total energy delivered to the system (Aquila system load factor for three states 51.8%). Empire purchased the greatest amount of total energy delivered to the system at 47.7% (Empire load factor 56.6 %).

Q. Based on customer density, load factor, generation mix, and economy of scale, what are your conclusions regarding how the systems of Aquila/MPS, KCP&L , Ameren , and Empire rank for revenue requirements and thus rates customers pay within the system?

A. Based on the systems involved, Aquila/MPS system would require higher rates than the other systems due to its low customer density, low system load factor, and higher-cost generation portfolio mix. Next would be Empire, then KCP&L, and the lowest in the state would be Ameren. Both KCP&L and Ameren have nuclear generation, which lowers average system generation costs. Aquila/MPS and Empire have generation mix based primarily on coal units, combustion turbines, which has a higher average cost than KCP&L and Ameren. It would appear that based on its generation mix, and lack of economies of scale, Empire would be struggling with its present rates. Empire has a higher load factor at 56.6 % than Aquila's load factor of 51.8 % average for electric utilities in Missouri, Kansas, and Colorado (Aquila/MPS at 48.9%), which will somewhat better utilize its generation mix. Just because one company has higher average rates per KWh compared to another utility, it does not always indicate that the company is inefficient or ineffective. This is because there are different distribution, transmission, and power resources required to effectively and efficiently serve the unique customer characteristics of each utility. In conclusion, there are many aspects to this rate case; however, we should not forget the unique system characteristics of Aquila/MPS, which require higher rates than other utilities to recover cost of service to maintain reliable service to customers and yet earn a fair return.

Q. Does this conclude your surrebuttal testimony?

A. Yes it does.