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Issues: Reliability

Witness: James L. Ketter  
Sponsoring Party: MO PSC Staff  
Type of Exhibit: Direct Testimony  
Case Nos.: ER-2004-0034

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**MISSOURI PUBLIC SERVICE COMMISSION**  
**UTILITY OPERATIONS DIVISION**

**DIRECT TESTIMONY**

**OF**

**JAMES L. KETTER**

**AQUILA, INC.**

**d/b/a AQUILA NETWORKS-MPS**

**CASE NO. ER-2004-0034**

**Jefferson City, Missouri**  
**December 2003**

**FILED**

**FEB 27 2004**

**Missouri Public  
Service Commission**





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James L. Ketter

1 I have been employed by the Commission since 1976. As an engineer on  
2 the Staff, I have testified before the Commission on certificates for service areas, electric  
3 transmission and power plant certification cases, and territorial agreements. I have also  
4 presented testimony on rate design in electric, steam, and gas rate cases. I am a  
5 registered Professional Engineer in the state of Missouri; my registration number is  
6 E-20056. I am a member of the National Society of Professional Engineers and I am a  
7 member of the Jefferson City Chapter of the Missouri Society of Professional Engineers.

8 Q. To which of the Aquila, Inc. (Aquila) operations are you directing your  
9 testimony?

10 A. This testimony only addresses the electric operations of Aquila in  
11 Missouri.

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

13 A. I address reliability indices utilized within the electric utility industry that  
14 provide a measure of a utility's overall performance in delivering electric service. These  
15 indices have been established to provide information regarding the average number of  
16 times a customer is without electric service, the average interruption duration for all  
17 customers, the average interruption duration for those customers interrupted and the  
18 average number of momentary outages. The Staff recommends that the Commission  
19 direct Aquila to submit reliability indices for the Missouri service area of Aquila to Staff  
20 until Aquila's financial condition attains investment grade and the Staff determines  
21 reporting this information is no longer necessary. This information will assist the Staff in  
22 monitoring the quality of service provided to Missouri customers in the Aquila service  
23 area.

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1 Q. Are other Staff witnesses filing testimony regarding quality of service?

2 A. Yes. Staff witness Lisa A. Kremer is concurrently filing direct testimony  
3 concerning customer service measurements for Aquila's Call Center.

4 Q. Please identify the reliability indices that are utilized by the electric utility  
5 industry.

6 A. System Average Interruption Frequency Index (SAIFI), System Average  
7 Interruption Duration Index (SAIDI) and Customer Average Interruption Duration Index  
8 (CAIDI) are the most common reliability indices used for electric utilities. Unadjusted  
9 indices, or actual data, reflect the total time or number of outages for the period reviewed.  
10 Adjusted indices remove the time and frequency of events that are the result of major  
11 storms.

12 Q. What benefit is gained by removing major storms from the unadjusted  
13 data?

14 A. When major events, such as the ice storm of January 2002 or the tornados  
15 that struck the western part of Missouri in May 2003, cause extended outages for a utility,  
16 the day-to-day normal operations of the electric system are obscured by the extended  
17 electric outages resulting from these events. Damage to electric facilities because of  
18 major storms and the subsequent outage that customers experience is important, but the  
19 adjusted number will better reflect the operation of the system under normal conditions.

20 Storms do not routinely affect the entire service area of the utility.  
21 Removing the outages that are the result of major storms or catastrophic events provides  
22 a common basis to determine a company-wide index under normal conditions.

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1 Adjustment for major storms in this manner is an accepted industry practice for reliability  
2 indices.

3 Q. Explain these indices and how they measure reliability.

4 A. SAIFI (number of occurrences per customer) reflects the average  
5 frequency of interruptions per customer and is defined as the total number of customer  
6 interruptions for the period covered, divided by the total number of customers served.  
7 SAIDI (hours or minutes per customer served) reflects the average interruption duration  
8 for the period covered and is defined as the sum of all customer interruption durations  
9 divided by the total number of customers served. CAIDI (hours or minutes per customer  
10 interrupted) reflects the average interruption duration and is defined as the sum of all  
11 customer interruption durations divided by the total number of customers interrupted.

12 These reliability indices reflect overall system performance. These  
13 measures can help in accessing the performance of the utility in the delivery of electric  
14 service by providing a quantitative measure to help define the quality of service.  
15 Typically, all of these indices are adjusted to eliminate the effects of major adverse  
16 weather conditions.

17 Q. Does Aquila presently calculate and maintain these indices?

18 A. Yes, this data is collected monthly.

19 Q. Customers often complain about momentary outages on the electric  
20 system. Is there an index to track these outages?

21 A. Yes, the Momentary Average Interruption Frequency Index (MAIFI)  
22 reflects the average number of momentary outages. These outages are the result of

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1 devices that interrupt a fault on the system and re-energize after a short delay, without  
2 outside human intervention.

3 Q. Is the MAIFI information compiled by Aquila?

4 A. Yes, this data is retrieved by reading counters that record the number of  
5 momentary interruptions and is compiled on a quarterly basis. Requesting the MAIFI  
6 data on a monthly basis would add a new task for Aquila employees. The Staff does not  
7 propose that this quarterly schedule be altered.

8 Q. Has the Staff received the SAIFI, SAIDI, CAIDI and MAIFI information  
9 from Aquila in the past?

10 A. Yes. In the UtiliCorp United, Inc. – St. Joseph Light & Power Company  
11 merger, Case No. EM-2000-292, Aquila was ordered by the Commission (effective  
12 December 24, 2000) to provide Staff with monthly reports of reliability standards for one  
13 year. Following the expiration of this period, Aquila has provided this information, on an  
14 informal basis, quarterly.

15 Q. Why is it necessary for the Staff to ask that the Commission require  
16 Aquila to report this reliability data?

17 A. Aquila has continued to provide this information on a voluntary basis to  
18 date, but absent a Commission order there is no assurance that Aquila will continue to do  
19 so in the future. The financial pressure on Aquila may affect its willingness to collect,  
20 calculate and provide this data to Staff. Therefore, Staff is requesting that Aquila be  
21 ordered by the Commission to provide its service quality measurements to Staff on a  
22 monthly basis (except MAIFI) until Aquila's financial condition attains investment grade  
23 and the Staff determines that reporting is no longer necessary. Staff will monitor this

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1 information to help determine the level of service that customers are receiving from  
2 Aquila. Reporting this information monthly will provide an ongoing summary of the  
3 transmission and distribution system's performance as measured by these reliability  
4 indices.

5 Q. Did Staff request that the Commission order Aquila to file this same  
6 information on a monthly basis in Case No. EF-2003-0465?

7 A. Yes. The same information and the frequency of reporting were proposed  
8 in that case.

9 Q. Are there other means to gather information concerning the quality of  
10 service provided by Aquila?

11 A. Yes. Customers call the Commission to assist them in resolving quality of  
12 service issues. In my position in the Engineering Analysis section of the Energy  
13 Department, I respond to customer inquiries and complaints concerning quality of  
14 service. This input from the customers may not be an accurate reflection of the overall  
15 performance of the company of providing electric service, but they voice their opinion  
16 and have personal experience concerning the provision of reliable service to their  
17 residence or business. This information is helpful in determining the quality of service  
18 provided to Aquila customers.

19 Q. What is Staff's recommendation?

20 A. Staff recommends that the Commission order Aquila to submit monthly  
21 data for Missouri customers of Aquila Networks-MPS for  
22 SAIFI, SAIDI and CAIDI in an electronic format, both unadjusted and adjusted indices to  
23 exclude major storm events, to Staff within twenty-one (21) days of the last day of the



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1 month being reported. In addition, Staff recommends that MAIFI information be  
2 provided to Staff on a quarterly basis and transmitted with the monthly data at the end of  
3 each quarter. Staff recommends that both reporting requirements extend until Aquila's  
4 financial condition reaches investment grade and the Staff determines that reporting is no  
5 longer necessary.

6 Q. Does this conclude your direct testimony?

7 A. Yes it does.