

Exhibit No.:
Issues: Fuel Adjustment Clause
Witness: Michael E. Taylor
Sponsoring Party: MO PSC Staff
Type of Exhibit: Rebuttal Testimony
Case No.: ER-2007-0004
Date Testimony Prepared: February 20, 2007

**MISSOURI PUBLIC SERVICE COMMISSION
UTILITY OPERATIONS DIVISION**

REBUTTAL TESTIMONY

OF

MICHAEL E. TAYLOR

FILED
MAY 2 2007
Missouri Public
Service Commission

AQUILA, INC.

D/B/A AQUILA NETWORKS-MPS AND AQUILA NETWORKS-L&P

CASE NO. ER-2007-0004

**Jefferson City, Missouri
February, 2007**

Staff Exhibit No. 227
Case No(s). ER-2007-0004
Date 4-12-07 Rptr xf

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**


In the matter of Aquila, Inc. d/b/a Aquila)
Networks-MPS and Aquila Networks-)
L&P, for authority to file tariffs increasing)
electric rates for the service provided to)
customers in the Aquila Networks-MPS)
and Aquila Networks-L&P service areas.)

Case No. ER-2007-0004

AFFIDAVIT OF MICHAEL E. TAYLOR

STATE OF MISSOURI)
) ss
COUNTY OF COLE)

Michael E. Taylor, of lawful age, on his oath states: that he has participated in the preparation of the following Rebuttal Testimony in question and answer form, consisting of 7 pages of Rebuttal Testimony to be presented in the above case, that the answers in the following Rebuttal Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true to the best of his knowledge and belief.


Michael E. Taylor

Subscribed and sworn to before me this 14 day of February, 2007.



SUSAN L. SUNDERMEYER
My Commission Expires
September 21, 2010
Callaway County
Commission #06942086


Notary Public

My commission expires 9-21-10

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OF

MICHAEL E. TAYLOR

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D/B/A AQUILA NETWORKS-MPS AND AQUILA NETWORKS-L&P

CASE NO. ER-2007-0004

EXECUTIVE SUMMARY2

COST RECOVERY MECHANISM--TESTING REQUIREMENTS2

REBUTTAL TESTIMONY

OF

MICHAEL E. TAYLOR

AQUILA, INC.

D/B/A AQUILA NETWORKS-MPS and AQUILA NETWORKS-L&P

CASE NO. ER-2007-00004

Q. Please state your name and business address.

A. Michael E. Taylor, P.O. Box 360, Jefferson City, Missouri, 65102.

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

A. I am employed by the Missouri Public Service Commission (Commission) as a Utility Engineering Specialist III in the Energy Department of the Utility Operations Division.

Q. Please describe your educational and work background.

A. I graduated from the University of Missouri-Rolla with a Bachelor of Science degree in Mechanical Engineering in May 1972 and a Master of Science degree in Engineering Management in August 1987. I served as an officer in the United States Navy (Submarine Service) from June 1972 to January 1979. I was employed by Union Electric Company (AmerenUE) from February 1979 until January 2003. While at AmerenUE, I worked at Callaway Plant in various departments including operations, work control, engineering, and quality assurance. In addition to these specific department functions; my work experience also includes quality control, instrumentation and controls, fire protection, industrial safety, outage scheduling, daily scheduling and work planning. I was licensed as a Senior Reactor Operator from 1983 until 1998. I served as an Emergency Duty

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1 Officer/Emergency Coordinator and Recovery Manager in the plant emergency response
2 organization. During my employment with AmerenUE, I also participated in corporate
3 activities related to other electrical generating and transmission facilities. These activities
4 included task group evaluation of existing generating units and recommendations regarding
5 AmerenUE's generation portfolio. In March 2003, I began my employment with the
6 Commission.

7 Q. Did you file direct testimony in this case?

8 A. No.

9 Q. Have you filed testimony previously before the Commission?

10 A. Yes. I filed testimony in the general rate increase cases of Kansas City Power
11 & Light Company and Union Electric Company d/b/a AmerenUE (Case Nos. ER-2006-0314
12 and ER-2007-0002, respectively).

13 **EXECUTIVE SUMMARY**

14 Q. Please provide a summary of your testimony.

15 A. This testimony responds to direct testimony filed by Aquila and provides
16 details of Staff's expectations for generating unit heat rate tests and/or efficiency tests for
17 utilities operating under a Commission approved fuel and purchased power cost recovery
18 surcharge. This testimony also provides Staff's position regarding use of certain industry
19 standards as a general basis for the heat rate or efficiency tests and describes actions that
20 should be taken by Aquila based on the results of the tests.

21 **COST RECOVERY MECHANISM—TESTING REQUIREMENTS**

22 Q. What is the purpose of your rebuttal testimony?

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1 A. My rebuttal testimony is responding to the direct testimony of Aquila witness
2 H. Davis Rooney regarding compliance with Commission Rule 4 CSR 240-3.161(2)(P). The
3 specific portion of Mr. Rooney's direct testimony addressed is page 27, lines 3-11.

4 Q. What are the requirements of 4 CSR 240-3.161(2)(P)?

5 A. This subsection of the rule provides requirements for heat rate tests and/or
6 efficiency tests for generating units. Specifically, it requires an electric utility that files to
7 establish a rate adjustment mechanism to file:

8 A proposed schedule and testing plan with written procedures for heat
9 rate tests and/or efficiency tests for all of the electric utility's nuclear
10 and non-nuclear generators, steam, gas, and oil turbines and heat
11 recovery steam generators (HRSG) to determine the base level of
12 efficiency for each of the units;

13
14 Q. Does Mr. Rooney's testimony comply with this subsection of the rule?

15 A. No. Mr. Rooney states in part, "Aquila has a proposed schedule for heat rate
16 and/or efficiency testing with written procedures." and "The unit's heat rate will be
17 determined with data collected during the Electrical Facility Ratings following the SPP
18 procedures."

19 Q. Has Aquila provided any information more detailed than that contained in Mr.
20 Rooney's testimony?

21 A. Yes. Staff submitted Data Request No. 0344 to obtain additional information.
22 Aquila has provided additional information in response to that Data Request. The additional
23 information was consistent with the original testimony in that it indicates Aquila's intention
24 to perform the required heat rate and/or efficiency testing in conjunction with the SPP
25 Facility Rating Test. According to Aquila's proposal, the typical data captured in the SPP
26 Facility Rating Test would be supplemented with additional data obtained during the test. By

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1 utilizing the typical rating test data and the supplemental data, a heat rate for the generating
2 unit would be determined.

3 Q. Does Staff agree that this proposed methodology satisfies the requirements of
4 4 CSR 240-3.161(2)(P)?

5 A. No.

6 Q. What procedures does Staff believe must be implemented by electric utilities
7 operating under a Commission approved fuel and purchased power cost recovery surcharge in
8 order for them to comply with the rule?

9 A. It is Staff's position that electric utilities operating under a fuel and purchased
10 power cost recovery surcharge must have procedures in place that: 1) require testing of
11 generation plant heat rates on a regular basis, 2) generally conform to industry-standard
12 performance testing methodologies, 3) require identification of plant systems, structures, or
13 components that are degrading overall plant heat rate/efficiency, and 4) require cost-effective
14 maintenance or replacement activities on any such systems, structures, or components that
15 have been identified as degrading overall plant heat rate/efficiency.

16 Q. Why does Staff believe these procedures are necessary for electric utilities
17 operating under a fuel and purchased power cost recovery surcharge?

18 A. Electric utilities recovering fuel and purchased power costs based on a fixed
19 amount set in a rate case (*i.e.*, using the traditional approach to rate setting) have strong
20 incentives to control their fuel and purchased power cost. If a utility can reduce its overall
21 fuel and purchased power cost below the fixed amount set in rates, this difference improves
22 the utility's profitability. If on the other hand the utility experiences fuel and purchased
23 power costs that exceed the fixed amount set in rates, this difference decreases the utility's

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1 profitability. This dynamic creates a strong incentive for the utility to control its fuel and
2 purchased power cost.

3 In contrast, electric utilities that can adjust their rates to reflect changes in fuel and
4 purchased power cost between rate cases may have incentives to act prudently in their
5 purchasing decisions; however, Staff does not view these incentives as being as effective as
6 the incentive that exists to control these costs if no changes in rates are possible between rate
7 cases.

8 Q. Does Staff have any specific recommendations for testing procedures?

9 A. Yes. Staff believes that a number of adequate testing procedures are provided
10 in The American Society of Mechanical Engineers' Performance Test Codes (ASME-PTCs).

11 Q. What are the ASME-PTCs?

12 A. The ASME-PTCs are documents that specify recommended procedures for
13 various types of power industry equipment. These procedures and documents are developed
14 by committees of industry experts and published by The American Society of Mechanical
15 Engineers (ASME). There are approximately fifty (50) Performance Test Codes associated
16 with testing of power industry equipment.

17 Q. Can you provide examples of ASME-PTC topics?

18 A. Yes. Some of the ASME-PTC topics are listed below:

19 General Instructions (PTC 1 – 2004)

20 Test Uncertainty (PTC 19.1 – 2005)

21 Digital Systems Techniques (PTC 19.22 – 1986)

22 Steam Turbines (PTC 6 – 2004)

23 Fired Steam Generators (PTC 4 – 1998)

24 Performance Test Code on Overall Plant Performance (PTC 46 – 1996)

25 Performance Monitoring Guidelines for Steam Power Plants (PTC PM – 1993)

26 Wind Turbines (PTC 42 – 1988)

27 Performance Test Code on Gas Turbines (PTC 22 – 2005)

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1 Q. Does Staff expect written procedures developed by Aquila for heat rate tests
2 and/or efficiency tests to duplicate the ASME-PTCs?

3 A. No. Staff does not expect Aquila's written procedures to duplicate the ASME-
4 PTCs. The ASME-PTCs provide a high level of detail, potentially more than would be
5 expected by Staff. The ASME-PTCs utilize current industry practices consistent with
6 obtaining accurate results, and should provide a starting point for development of testing
7 procedures specific to individual generating units.

8 Q. When subsection (2)(P) of the above-noted Commission rule says "determine
9 the base level of efficiency for each of the units", what does Staff understand would be
10 included in this determination?

11 A. Staff expects the "base level of efficiency" to be determined in a manner that
12 assures the generating unit is operating at optimum conditions unless there are known and
13 expected degradation mechanisms, which then need to be taken into account. For newer
14 generating units, the "base level of efficiency" could be determined from performance
15 guarantee tests following construction of the unit. For older generating units, however, the
16 "base level of efficiency" must be determined through a rigorous process that verifies the unit
17 is performing at a level consistent with its age, hours of service, and prudent preventive and
18 corrective maintenance.

19 Q. Earlier in your testimony, you stated that electric utilities operating under a
20 fuel and purchased power cost recovery surcharge must, among other things, have procedures
21 in place that "require testing of generation plant heat rates on a regular basis". What does
22 Staff mean by "a regular basis"?

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1 A. Staff's expectation would be that the required testing would be performed at
2 intervals not to exceed twenty-four (24) months.

3 Q. What is the basis for Staff's twenty-four (24) month expectation?

4 A. Subsection 4 CSR 240-3.161(3)(Q) provides information relative to this
5 expectation. This subsection is included in a section of the rule that establishes requirements
6 for filing a general rate proceeding (following the general rate proceeding that established a
7 utility's rate adjustment mechanism (RAM)) in which the utility requests that its RAM be
8 continued or modified. Subsection (3)(Q) sets forth the following filing requirement:

9 The results of heat rate tests and/or efficiency tests on **all** the electric utility's
10 nuclear and non-nuclear steam generators, HRSG, steam turbines and
11 combustion turbines conducted within the **previous twenty-four (24) months**.
12 (Emphasis added.)

13
14 This subsection indicates that all the electric utility's generating units would have been tested
15 within the previous twenty-four (24) months. Therefore, it is reasonable to conclude from
16 this requirement that a testing interval not to exceed twenty-four (24) months is expected.

17 Q. Does this conclude your rebuttal testimony?

18 A. Yes, it does.