

Exhibit No.:
Issue: Sibley Unit 3 SCR; Heat Rate
Testing; Crossroads and Sibley In-
Service Criteria
Witness: Terry S. Hedrick
Type of Exhibit: Direct Testimony
Sponsoring Party: Aquila, Inc. dba KCP&L Greater
Missouri Operations Company
Case No.: ER-2009-____
Date Testimony Prepared: September 5, 2008

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. ER-2009-____

DIRECT TESTIMONY

OF

TERRY S. HEDRICK

ON BEHALF OF

**AQUILA, INC. dba
KCP&L GREATER MISSOURI OPERATIONS COMPANY**

**Kansas City, Missouri
September 2008**

DIRECT TESTIMONY

OF

TERRY S. HEDRICK

Case No. ER-2009-_____

1 **Q: Please state your name and business address.**

2 A: My name is Terry S. Hedrick. My business address is 1201 Walnut, Kansas City,
3 Missouri 64106.

4 **Q: By whom and in what capacity are you employed?**

5 A: I am employed by Kansas City Power & Light Company (“KCP&L”) as Manager of
6 Plant Engineering.

7 **Q: What are your responsibilities?**

8 A: My responsibilities include the direct supervision of supervising engineers at the facilities
9 of KCP&L and Aquila, Inc. dba KCP&L Greater Missouri Operations Company
10 (“GMO” or the “Company”). These supervising engineers work directly with the plant
11 managers on the development of capital budgets and the actual implementation
12 (development/design/procurement/construction/commissioning) of capital projects.
13 Previously with Aquila, Inc. my role, as Director of Generation Services, held similar
14 responsibilities which included the direct supervision of engineers that implemented
15 capital budget projects. These responsibilities included the Sibley Unit 3 Selective
16 Catalytic Reduction (“SCR”) project.

17 **Q: Please describe your education, experience and employment history.**

18 A: In 1985, I received a Bachelor of Science Degree in Mechanical Engineering from the
19 University of Missouri – Columbia. After receiving my degree, I joined the Missouri

1 Public Service Company, which later became UtiliCorp and ultimately Aquila, as Staff
2 Engineer at the Sibley Generating Station. From that time until 1998, I held positions of
3 Maintenance Engineer and Assistant Station Superintendent – Maintenance. In 1998, I
4 began working in the corporate Production department in the capacity of Senior
5 Production Engineer. From that time until the integration with KCP&L, I have held the
6 positions of Generation Services Manager and Director of Generation. As stated
7 previously, I am now employed with KCP&L as Manager of Plant Engineering.

8 **Q: Have you previously testified in proceedings before the Missouri Public Service**
9 **Commission or before any other utility regulatory agency?**

10 A: Yes, I have provided testimony before the Missouri Public Service Commission
11 (“MPSC”).

12 **Q: What is the purpose of your testimony?**

13 A: The purpose of my testimony is to describe, on behalf of GMO, the Sibley SCR Project
14 including the associated in-service criteria, heat rate testing status at the Company’s
15 generating facilities, and in-service criteria for the Crossroads generating plant.

16 **SIBLEY UNIT 3 SCR SYSTEM**

17 **Q: Please describe the status of the SCR system at Sibley Unit 3.**

18 A: In response to the 2006 Study of Emission Reduction Strategies to Comply with the
19 Clean Air Interstate Rule (“CAIR”) and Clean Air Mercury Rule (“CAMR”), performed
20 by Sargent & Lundy (“S&L”), Aquila, Inc. decided to proceed with the SCR system
21 project on Sibley Unit 3. In September 2006, the bid process was initiated. The three
22 SCR manufacturers considered in the bid evaluation included: Babcock Power (Riley),
23 Alstom, and Babcock & Wilcox. These suppliers were considered to be utility industry

1 leaders in the SCR area and have extensive experience in the design and construction of
2 SCR units. On November 22, 2006, bids were received and subsequently evaluated. In
3 January 2007, Black & Veatch was selected as the Owner's Engineer and the design
4 work for the installation began. In August 2007, the design work for foundations was
5 complete and the associated foundations and steel work commenced in
6 November/December 2007. Significant duct installation began in March 2008.
7 Preliminary design and modeling efforts indicate that the SCR is expected to result in
8 significant reductions of nitrogen oxide ("NOx") emissions from the Unit, with the intent
9 to improve air quality in the Kansas City area.

10 **Q: What is the schedule for the installation of the SCR?**

11 A: The SCR installation is scheduled to be complete by January 1, 2009. During first
12 quarter 2009, the project tasks and testing will include: start-up, testing, commissioning,
13 and tuning. As a result, the project is currently on schedule to affect the summer 2009
14 ozone season. Construction work on minor activities and project close-out activities are
15 expected to continue through second quarter 2009.

16 **Q: Was a competitive bid process employed to select Babcock Power?**

17 A: Yes, in response to the bid process, Aquila, Inc. received and reviewed a total of two bids
18 from the three qualified SCR Manufacturers (Alstom elected not to bid). The evaluation
19 process considered key criteria including: capital cost, operating costs, schedule,
20 evaluation of SCR performance guarantees, and overall bidder experience in SCR design
21 and construction. Of all the bidders, Babcock Power proved to best address the
22 evaluation criteria, which included extensive pre-bid site visits and evaluation on their
23 part. Additionally, at the conclusion of the evaluation process, Babcock Power was

1 determined to be the preferred bidder, and a contract was subsequently negotiated
2 between the parties.

3 **Q: Are the Sibley Unit 3 SCR costs within the developed estimates and is the project**
4 **expected to be completed within budget?**

5 A: Yes, as of August 2008, projected costs for the Sibley Unit 3 SCR are tracking within the
6 February 2007 authorized budget amounts.

7 **Q: What steps have been taken to effectively manage the Sibley Unit 3 SCR project?**

8 A: A multi-contract approach was selected in an effort to control costs, schedule, and quality
9 of the project. The project was initiated by identifying a project manager and
10 development of an experienced project management team. In addition, the contract with
11 Babcock Power contains provisions for guaranteeing contractor performance, schedule,
12 cost, warranty, and design with liquidated damages for non-performance. For
13 engineering support, Black & Veatch was interviewed and selected to perform foundation
14 design and owner's engineering services and support. The team of engineers working in
15 conjunction with the manufacturers and suppliers has developed a schedule of meetings
16 to track critical path construction activities and safety. Project status reports are
17 developed (and updated) to track progress.

18 **Q: Has in-service criteria been developed for the Sibley Unit 3 SCR?**

19 A: Yes, the in-service criteria was developed and reviewed with Commission Staff. Staff
20 will be notified in advance of the test period and the test results will be provided to Staff.
21 In addition, Staff will have the option to participate during the actual testing. The agreed
22 upon in-service criteria for the Sibley Unit 3 SCR system is attached as Schedule TSH-1.

HEAT RATE TESTING

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Q: Have heat rate testing procedures and a corresponding test schedule been developed and provided to Staff, to satisfy the Fuel Adjustment Clause (FAC) requirements as per 4 CSR240-3.161 (2)(P) that were waived as part of the Order in Case No. ER-2007-0004?

A: Yes. The procedures and test schedule were developed with Staff participation and approval. The Initial Proposed Heat Rate Testing Schedule 2007 – 2009 and Procedures are attached as Schedule TSH-2.

Q: What is the status of the heat rate test schedule per the requirements in 4CSR240-3.161 (3)(Q)?

A: The units/boilers that have been tested include:

- Sibley Units: 1, 2, and 3;
- Lake Road Units: 2, 3, 4, and 5;
- Lake Road Boilers: 1 and 3 (note that a plan is in-place to re-test due to unreasonable data as per the procedure);
- Greenwood Units: 1 and 2; and
- South Harper Units 1, 2, and 3.

Q: Are there units/boilers that are not currently meeting the provided schedule?

A: Yes. Greenwood Unit 4 and Ralph Green Unit 3 are not currently meeting the initial schedule.

Q: Please provide explanations as to why these units/boilers are not meeting the initial schedule.

1 A: Due to instrumentation and metering requirements and calibration, the schedule required
2 revision for Greenwood Unit 4 and Ralph Green Unit 3. In addition, Ralph Green Unit 3
3 is a peaking unit that has not been dispatched to operate at a load to allow heat rate
4 testing (that is, base control for 2 ½ hours as per the test procedure).

5 **Q: Has the heat rate schedule been revised?**

6 A: Yes. The schedule is dynamic according to plant scheduling conditions. The majority of
7 the units on the updated schedule will address the time requirements for the April 2009
8 true-up. See attached updated Schedule TSH-3.

9 **CROSSROADS IN-SERVICE CRITERIA AND TESTING SCHEDULE**

10 **Q: Has the in-service criteria and testing schedule for the Crossroads generating**
11 **facility been developed and provided to Staff?**

12 A: Yes. The in-service criteria and testing schedule were developed in conjunction with Mr.
13 Michael Taylor and Mr. Dave Elliott of the MPSC Staff at a meeting in May 2008. A
14 final version was submitted to Staff and approved for utilization. See attached Schedule
15 TSH-4.

16 **Q: When did the Crossroads units go commercial?**

17 A: Summer of 2002.

18 **Q: When will the in-service testing be performed?**

19 A: The in-service testing was performed the week of August 18, 2008 and is currently being
20 evaluated and a final report is in process.

21 **Q: Does that conclude your testimony?**

22 A: Yes, it does.

In-Service Criteria for NOx Control Equipment
Sibley 3 SCR

1. All major construction work is complete.
2. All required preoperational tests have been successfully completed.
3. Equipment successfully meets operational contract guarantees. (Note: Some operational contract guarantee verification periods may extend beyond the duration of the schedule for a rate case. These guarantees will be evaluated for applicability.)
4. The equipment shall be operational and demonstrate its ability to operate at a NOx reduction efficiency equal to or greater than 85% over a continuous four (4) hour period while the generating unit is operating at or above 95% of its design load.
5. The equipment shall also demonstrate its ability to operate at a NOx reduction efficiency equal to or greater than 81% over a continuous 120-hour period while the generating unit is operating at or above 80% of its design load.
6. Continuous NOx monitoring systems are operational and demonstrate the capability of monitoring the NOx emissions to satisfy the parameters in items (4) and (5) above.

Schedule TSH-2

Initial Heat Rate Testing Schedule 2007-2009

Plant	Month/Year
Sibley 1	Apr-08
Sibley 2	Apr-08
Sibley 3	11/2007 and 1/09
Greenwood 1	Jun-08
Greenwood 2	Jun-08
Greenwood 3	Jun-09
Greenwood 4	Jun-08
Ralph Green 3	Jun-08
Nevada	TBD
KCI 1	TBD
KCI 2	TBD
South Harper 1	Nov-08
South Harper 2	Apr-09
South Harper 3	Mar-08
Lake Road 1	Dec-09
Lake Road 2	Jun-08
Lake Road 3	Jun-08
Lake Road 4	Jun-08
Lake Road 5	May-08
Lake Road 6	TBD
Lake Road 7	TBD
Lake Road Boiler 1	Apr-08
Lake Road Boiler 2	Jun-09
Lake Road Boiler 3	Jun-08
Lake Road Boiler 4	Apr-09
Lake Road Boiler 5	May-09
Lake Road Boiler 8	Sep-08
Jeffrey 1	Apr-08
Jeffrey 2	Apr-09
Jeffrey 3	Nov-08
latan 1	Dec-08

KCI and LR 6, 7 - data will be collected during a run opportunity, if possible.

Schedule TSH-3

Proposed Heat Rate Testing Schedule 2007-2009 Rev. 1

Plant	Month/Year	
Sibley 1	Aug-08	testing completed, data to be reviewed
Sibley 2	Aug-08	testing completed, data to be reviewed
Sibley 3	Aug-08	testing completed, data to be reviewed
Greenwood 1	Aug-08	testing completed, data to be reviewed
Greenwood 2	Aug-08	testing completed, data to be reviewed
Greenwood 3	Aug-08	testing completed, data to be reviewed
Greenwood 4	Aug-08	testing completed, data to be reviewed
Ralph Green 3	Aug-08	testing completed, data to be reviewed
Nevada	TBD	
KCI 1	TBD	
KCI 2	TBD	
South Harper 1	Aug-08	testing completed, data to be reviewed
South Harper 2	Aug-08	testing completed, data to be reviewed
South Harper 3	Aug-08	testing completed, data to be reviewed
Lake Road 1	May-09	
Lake Road 2	Jun-08	testing completed, data to be reviewed
Lake Road 3	Jun-08	testing completed, data to be reviewed
Lake Road 4	Jun-08	testing completed, data to be reviewed
Lake Road 5	May-08	testing completed
Lake Road 6	TBD	
Lake Road 7	TBD	
Lake Road Boiler 1	Apr-08	testing completed in April 2008, unit to be retested
Lake Road Boiler 2	Apr-09	
Lake Road Boiler 3	Jun-08	testing completed in June 2008, unit to be retested
Lake Road Boiler 4	Apr-09	
Lake Road Boiler 5	May-09	
Lake Road Boiler 8	Sep-08	
Jeffrey 1	Dec-08	
Jeffrey 2	Apr-09	
Jeffrey 3	Nov-08	
Iatan 1	Dec-08	

KCI, Nevada, and LR 6, 7 - data will be collected during a run opportunity, if possible.

Aquila – Crossroads Combustion Turbine Simple Cycle Units 1-4

In-Service Test Criteria (Nameplate Capacity of < 95 MW)

1. All major construction work is complete.
2. All preoperational tests have been successfully completed.
3. Unit successfully meets all contract operational guarantees.
4. Unit successfully demonstrates its ability to initiate the proper start sequence resulting in the unit operating from zero (0) rpm (or turning gear) to base load when prompted at a location (or locations) from which it is normally operated.
5. If unit has fast start capability, the unit demonstrates its ability to meet the fast start capability.
6. Unit successfully demonstrates its ability to initiate the proper shutdown sequence from base load resulting in zero (0) rpm (or turning gear) when prompted at a location (or locations) from which it is normally operated.
7. Unit successfully demonstrates its ability to operate at minimum load for one (1) hour.
8. Unit successfully demonstrates its ability to operate at or above 98% of peak load for one (1) hour.
9. Unit successfully demonstrates its ability to operate at or above 98% of base load for four (4) hours.
10. Sufficient transmission interconnection facilities shall exist for the total plant design net electrical capacity at the time the unit is declared fully operational and used for service.
11. Sufficient transmission facilities shall exist for the total plant design net electrical capacity from the generating station into the utility service territory at the time the unit is declared fully operational and used for service.
12. If unit has dual fuel capability, the unit will successfully demonstrate the ability to start on the back-up/secondary fuel as described in Item 4.
13. If unit has dual fuel capability, the unit will demonstrate the ability to transfer between the two fuels while on line.
14. If unit has dual turbines, the unit will demonstrate the ability to operate in single-turbine mode and transfer from single-turbine mode to dual turbine mode (and vice versa) while on line.