Exhibit No.:	
Issues:	In-Service Construction Audit
Witness:	Leon C. Bender
Sponsoring Party:	MO PSC Staff
Type of Exhibit:	Direct Testimony
Case No.:	ER-2007-0004
Date Testimony Prepared:	January 18, 2007

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY OPERATIONS DIVISION

DIRECT TESTIMONY

OF

LEON C. BENDER

AQUILA, INC.

D/B/A AQUILA NETWORKS-MPS

AND AQUILA NETWORKS-L&P

CASE NO. ER-2007-0004

Jefferson City, Missouri
January 2007

****Denotes Highly Confidential Information****

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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 LEON C. BENDER

STATE OF MISSOURI)
) ss
COUNTY OF COLE)

Leon C. Bender, of lawful age, on his oath states: that he has participated in the preparation of the following Direct Testimony in question and answer form, consisting of 11 pages of Direct Testimony to be presented in the above case, that the answers in the following Direct 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.

Leon C Bender
Leon C. Bender

Subscribed and sworn to before me this 17th day of January, 2007.

NOTARY PUBLIC NOTARY SEAL STATE OF MISSOURI

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

Susan L Sundermeyer
Notary Public

My commission expires 9-21-10

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CASE NO. ER-2007-0004

Q. Please state your name and business address.

A. Leon C. Bender, 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 Staff (Staff) as a Regulatory Engineer in the Energy Department of the Utility Operations Division.

Q. Please describe your educational and work backgrounds?

A. I received a Bachelor of Science degree in Mechanical Engineering in August 1978 from Texas Tech University. I became employed by Southwestern Public Service Company (SPS) as a power generation plant design engineer in September 1978. While employed by SPS, I was lead engineer on many projects involving design and construction of new power generating stations and the upgrading of their older plants. In 1983, I became a registered Professional Engineer in the state of Texas. In 1986, I transferred to SPS's newly formed subsidiary company, Utility Engineering Corporation, and was responsible for various projects at various other clients' power generation plants. In June 1990, I accepted employment as a systems engineer with Entergy Operations, Inc. at the nuclear powered

generating station, Arkansas Nuclear One. In December 1995, I joined the Missouri Public Service Commission (Commission).

Q. Have you filed testimony before this Commission in previous cases?

A. Yes, please refer to Schedule LCB-1 for a listing of previous cases in which I have filed testimony.

Executive Summary

Q. Would you please provide a brief summary of your Direct Testimony in this case?

A. This testimony addresses the in-service criteria Staff used and the construction audit Staff performed concerning Aquila, Inc.'s (Aquila) South Harper electric generating facility. I originally performed the in-service criteria review and construction audit for purposes of Aquila's last rate increase case, Case No. ER-2005-0436.

While the Staff has found the South Harper facility meets Staff's in-service criteria, the Staff did not and still does not recommend the facility be placed into rate base until pending litigation is resolved. That litigation could still result in Aquila having to remove the facility; therefore, it is still Staff's position that the facility not be placed into rate base.

Based on its construction audit Staff has included the total amount of ** _____ ** from change orders to the project be included in the costs Staff is using as part of its basis for the costs of a 525 MW CT generation facility—the MPS facility—the Staff is imputing to MPS. For further explanation of the MPS facility please refer to Staff Witness Cary Featherstone's direct testimony.

Q. What is the purpose of your Direct Testimony in this case?

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A. The purpose of my testimony is to again identify the in-service issues concerning Aquila's South Harper Station. These issues are: the in-service criteria and the construction audit for the South Harper Station.

A. Please describe the South Harper Station.

Q. South Harper Station is located just south of Peculiar, Missouri at the intersection of South Harper Road and 243d Street. It is located next to the Southern Star Gas Compressor Station. On the property, Aquila located three new generating units that are approximately 105 MW each, Siemens Westinghouse simple cycle combustion turbine generators. Also built on the property is a control/service building and the Peculiar 345/161/69 KVA Substation to handle the full output of all three generating units.

In Service Criteria

Q. What are in-service criteria?

A. In-service criteria are a set of operational tests or operational requirements developed by the Staff to determine whether or not a new unit is "fully operational and used for service."

Q. Why is it important that the units be "fully operational and used for service?"

A. Section 393.135, RSMo. 2000, a state statute adopted by Initiative, Proposition No. 1, on November 2, 1976, requires that these units be fully operational and used for service before they can be added to the rate base. Section 393.135, RSMo. 2000 reads as follows:

> Any charge made or demanded by an electrical corporation for service, or in connection therewith, which is based on the costs of construction in progress upon any existing or new facility of the electrical corporation, or any other cost associated with owning, operating, maintaining, or financing any property before it is fully operational and used for service, is unjust and unreasonable, and is prohibited. (Emphasis added)

Q. Why is it important to have in-service criteria?

A. In-service criteria are the basis upon which a new unit is determined to be "fully operational and used for service" and is to be given ratemaking treatment. A new unit may not have any historical operating information from which the Staff could make a recommendation to the Commission of whether the new unit is "fully operational and used for service." In such situations, operation tests must be established and applied to new generating units in order for Staff to file its recommendation.

Q. Please describe the in-service criteria Staff used for the South Harper Station?

A. The in-service criteria Staff used for the South Harper Station is attached in this testimony in Schedule LCB-2. Briefly, the in-service criteria includes certain operational tests that give an indication of how the new units will perform. Certain fundamental tests are included to prove that the units can startup and shutdown properly, operate at its full design capacity, operate for a period of time without tripping off line, and operate at multiple load points without experiencing problems which make it difficult to run and dispatch the unit on a reliable basis. The units must also be able to deliver their full capacity to the electrical transmission system without causing problems to the units or the transmission system.

Q. Would you explain Staff's in-service criteria Item 1?

A. Item 1 of Staff's in-service criteria requires that all major construction work be completed to be "fully operational." This item ensures all the equipment that Aquila intends to use to operate the plant is completely constructed according to plan and further construction is not necessary for the units to perform their intended purpose of generating electricity for the electrical system.

Q. Has this criterion been met?

A. Yes. I visited the construction site numerous times during various stages of completion and testing. During visits on August 11, 2005 and October 6, 2005, I observed that all major construction was complete. The construction contractors hired by Aquila to assemble and test this plant have moved off the property and only minor revisions are being done.

Q. Would you explain Staff's in-service criteria Item 2?

A. Item 2 requires that all preoperational tests have been successfully completed. This ensures that all equipment is working as intended before the units commence operation.

Q. Has this criterion been met?

A. Yes. I reviewed Aquila's response to MPSC DR No.'s 331 and 333 in Case No. ER-2005-0436. The response includes Siemens Westinghouse Power Corporation (SWPC) performance testing specification and commissioning manuals. SWPC requires numerous pretest checks that must be performed before startup. I examined the SWPC commissioning manual which contains the preoperational check-offs kept at the South Harper Station and concluded that these test were performed as required.

Q. Would you explain Staff's in-service criteria Item 3?

A. Item 3 requires that all operational guarantees be met. Staff believes that in order for these units to be considered to be "fully operational and in service" that the operational guarantees made by the equipment manufacturers must be met.

Q. Has this criterion been met?

A. Yes. I reviewed the documents presented by Aquila's response to MPSC DR No. 330 in Case No. ER-2005-0436 and in the In Service Status Report and determined that all operational guarantees have been met.

Q. Would you explain Staff's in-service criteria Item 4 and Item 6?

A. Items 4 and 6 require that each unit be able to startup and shutdown normally. Combustion turbines are complex machines and many things could go wrong during startup and shutdown. Staff expects that to be "fully operational and in service" a unit should be able to startup and shutdown normally without problems occurring which would impair its operation or cause damage to other systems.

Q. Has this criterion been met?

A. Yes. Staff observed normal startups and shutdowns on two units and reviewed operational data submitted by Aquila in MPSC DR No. 332 in Case No. ER-2005-0436 for all the units to verify that the units met these criteria.

Q. Would you explain Staff's in-service criteria Item 5?

A. Item 5 addresses the fast start capability of each unit. These units do not have fast start capability therefore item 5 is not applicable to the South Harper Station units.

Q. Would you explain Staff's in-service criteria Item 7?

A. Item 7 requires that the units operate at minimum load for 1 hour. The units may be required to operate at that load for short periods of time due to system requirements.

Q. Has this criterion been met?

A. Yes. Staff reviewed the operational documents submitted by Aquila in MPSC DR NO. 332 in Case ER-2005-0436 and concluded that each of these units met this criteria.

Q. Would you explain Staff's in-service criteria Item 8?

A. Item 8 requires that each of the units operate at or above 95% of nominal capacity for 4 continuous hours. This is to ensure that the units do not have any operational

problems which would cause them difficulties with meeting system requirements for longer periods of time that they may be required to operate.

Q. Has this criterion been met?

A. Yes. Staff has reviewed the operational documents submitted by Aquila in MPSC DR No. 332 in Case No. ER-2005-0436 and concluded that each of these units has met this criterion.

Q. Would you explain Staff's in-service criteria Item 9?

A. Item 9 of Staff's in-service criteria requires that each unit have at least a 50% capacity factor in a 72 hour period. Capacity factor is defined as the amount of energy generated during a period of time divided by the amount the unit is capable of supplying during the same period.

Q. Has this criterion been met?

A. Yes. Staff has reviewed the operational documents submitted by Aquila in MPSC DR. No.'s 335 and 332 in Case No. ER-2005-0436 and concluded that each of these units has met this criterion.

Q. Would you explain Staff's in-service criteria Item 10?

A. Item 10 requires that the transmission and distribution facilities demonstrate their capability to export the entire plant net capacity. This is to ensure that the entire plant capacity can be fully utilized when needed to meet system requirements without causing problems with the transmission equipment on and off site.

Q. Has this criterion been met?

A. Yes. Staff observed all units at South Harper Station generating at their maximum capacity simultaneously and has reviewed the documents submitted by Aquila in

MPSC DR No.'s 329 and 332 in Case No. ER-2005-0436 and concluded that each of these units has met this criterion.

Q. Would you explain Staff's in-service criteria Items 11 and 12?

A. Items 11 and 12 address the duel fuel capability of the units. These units do not have duel fuel capability therefore Items 11 and 12 are not applicable to the South Harper Station units.

Q. Does the South Harper Station still meet the Staff's in-service criteria?

A. Yes.

Q. Does having met the Staff's in-service criteria mean that the South Harper Station should be declared in service for rate making purposes?

A. No. The Staff's in-service criteria, as explained earlier, is a set of criteria to establish that the plant is fully operational as far as the physical aspects of the plant are concerned. Although the South Harper Station has met Staff's in-service criteria, there remains a chance that, due to pending litigation, Aquila may have to remove the plant from service. Staff declines to recommend the costs of the plant be included in rate base until after the outcomes of the legal proceedings are final. Please see Staff Witness Cary Featherstone's testimony on this issue.

Q. Does having met the Staff's in-service criteria mean that the South Harper Station was not able to meet part of Aquila's system demands at an earlier date?

A. No. Each unit was declared available to assist in meeting system load requirements at an earlier date than having fully met Staff's in-service criteria. According to Aquila's response to DR No. 367 in Case ER-2005-0436, Unit one was available for dispatch

on July 11, 2005, Unit two was available for dispatch July 1, 2005, and Unit three was available for dispatch June 30, 2005.

Construction Audit

Q. What is a construction audit?

A. A construction audit is a review of a construction project to determine the final cost of the project and whether the project was completed as planned and on time per schedule.

Q. What was your responsibility for Staff's construction audit of the South Harper facility?

A. I monitored the progress of the project during construction and reviewed change order costs associated with the project.

Q. How did you monitor the progress of the construction project?

A. I, along with other members of the Staff, made numerous visits to the construction site and had numerous telephone conversations during the construction and testing phases of the project. I obtained construction and testing schedules and monitored the progress of the construction and testing. Staff visited with various Aquila managerial personnel and Aquila's contracted construction manager during the visits to obtain regular updates on the progress of the project.

Q. How did you review the costs associated with the project?

A. I, along with Staff members Phil Williams and Cary Featherstone, reviewed the cost associated with the construction contracts made with the various contractors Aquila had hired. I also reviewed the change orders to those contracts.

Q. What is a change order and what does it do?

A. A change order is a method by which the contractor receives approval from the company to initiate a change in the work and/or the cost specified in the original contract. Change orders provide a method which the company can track any changes in the cost of the contract and provide specific information as to why the cost changed.

Q. Are change orders unusual on a project this size?

A. No. Most construction projects require change orders due to unforeseen situations which occur during construction or a change in the original requirements by the company and the more complex the project is, the more likely unforeseen situations will occur as construction progresses.

Q. How are change orders processed?

A. Aquila and the engineering firm Aquila employed to manage and oversee the South Harper construction project, Sega, review requests from contractors and vendors for changes to the original contract terms. Aquila must approve and authorize any changes and the resulting costs, from the original work defined in the contracts. With the authorization from Aquila, contractors perform the additional or changed work scope, charging any additional cost to the project. Only those costs that have been approved are paid to the contractors and become part of the total construction costs to the project.

Q. Did Aquila issue any change orders for South Harper Station?

A. Yes. Schedule LCB-3 identifies the major contracts to which change orders for this project were issued and the total amounts of the change orders.

Q. How did you determine the total amount of the change orders?

A. The total amount of the change orders was determined by examining each individual change order.

Q. What cost did Staff arrive at from change orders to original contracted amounts for work for the South Harper facility?

A. The Staff found change order costs of ** _____ ** should form part of the basis for costs to be included for the 525 MW CT MPS facility Staff is imputing to Aquila.

Q. Does this conclude your Direct Testimony?

A. Yes, it does.

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List of Previously Filed Testimony

1. ER-2007-0002	Union Electric Company d/b/a AmerenUE	Construction Audit
2. ER-2006-0314	Kansas City Power & Light Company	Fuel and Purchase Power
3. EA-2006-0309	Aquila, Inc.	Construction Audit
4. ER-2005-0436	Aquila, Inc.	Plant In Service, Construction Audit
5. ER-2004-0570	The Empire District Electric Company	Fuel and Purchase Power
6. ER-2004-0034	Aquila, Inc.	Purchase Power
7. EC-2002-0001	Union Electric Company d/b/a AmerenUE	Fuel and Purchase Power
8. ER-2001-0299	The Empire District Electric Company	Fuel and Purchase Power
9. EM-97-0515	Kansas City Power & Light Company	Fuel and Purchase Power
10. ER-97-0394	Utilicorp United, Inc.	Fuel Expense
11. EC-97-0362	Utilicorp United, Inc.	Fuel Expense

Staff In-Service Test Criteria
Combustion Turbines over 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 rpm (or turning gear) to full load when prompted at a location (or locations) from which it is normally operated.
5. If the 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 full load resulting in zero 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 95% of nominal capacity for 4 continuous hours.
9. Unit successfully demonstrates its ability to produce an amount of energy (MWhr) within a 72 hour period that results in a capacity factor of at least 50% during the period when calculated by the formula: capacity factor = (MWhrs generated in 72 hours) / (nominal capacity x 72 hours).
10. Transmission and distribution facilities demonstrate their capability to export the entire plant net capacity.
11. If unit has dual fuel capability, the unit successfully demonstrates its ability to start on the back up/secondary fuel as described in item 4.
12. If unit has dual fuel capability, the unit successfully demonstrates its ability to transfer between the two fuels while on line.

Schedule 3

Is Deemed

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In Its Entirety