Exhibit No.:	
Issues:	Plant In-Service
Witness:	Michael E. Taylor
Sponsoring Party:	MO PSC Staff
Type of Exhibit:	True-Up Direct Testimony
Case No.:	ER-2006-0314
Date Testimony Prepared:	November 7, 2006

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY OPERATIONS DIVISION

TRUE-UP DIRECT TESTIMONY

OF

MICHAEL E. TAYLOR

KANSAS CITY POWER & LIGHT COMPANY

CASE NO. ER-2006-0314

Jefferson City, Missouri
November 2006

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of the Application of Kansas City Power & Light Company for Approval to Make Certain Changes in its Charges for Electric Service to Begin the Implementation of Its Regulatory Plan	)))))	Case No. ER-2006-0314

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 True-Up Direct Testimony in question and answer form, consisting of 3 pages of True-Up Direct Testimony to be presented in the above case, that the answers in the following True-Up 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.

Michael E. Taylor

Subscribed and sworn to before me this 3 day of November, 2006.

NOTARY PUBLIC NOTARY SEAL STATE OF MISSOURI

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

Notary Public

My commission expires 9-21-10

Table of Contents

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MICHAEL E. TAYLOR

KANSAS CITY POWER & LIGHT COMPANY

CASE NO. ER-2006-0314

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. Are you the same Michael E. Taylor who has previously filed direct testimony in this case?

A. Yes, I am.

EXECUTIVE SUMMARY

Q. Please provide an executive summary of your testimony.

A. At the time direct testimony was filed in this case, the Spearville Wind Energy Facility (Spearville) was not operational and Kansas City Power & Light Company (KCPL) had not assumed ownership of the facility. It was noted in my direct testimony that Spearville would be evaluated after the true-up period (September 30, 2006). Spearville has satisfactorily met the in-service criteria established in Case No. EO-2005-0329 and should be considered "fully operational and used for service".

PROJECT DESCRIPTION

Q. Please describe the project designated as the Spearville Wind Energy Facility.

A. The Spearville Wind Energy Facility is located near Spearville, Kansas (approximately 15 miles northeast of Dodge City, Kansas). The site consists of approximately 5,500 acres. The facility includes 67 General Electric wind turbine generators (1.5 MW each) for a nominal electrical capacity of 100.5 MW. enXco, Inc. was selected by KCPL to develop and construct the facility. A KCPL transmission substation was constructed at the site. The KCPL substation connects to the Southwest Power Pool, Inc. through Aquila, Inc.'s Spearville substation (adjacent to the KCPL substation). The facility status was reviewed after the end of the true-up period (September 30, 2006).

Q. Have you personally visited the facility being considered in this testimony?

A. Yes. I visited the site on July 12 and with David Elliott of the Energy Department Staff on September 27 and 28, 2006. During the site visits, components of the wind turbine generators (WTG) were inspected prior to final assembly, assembly of WTG was observed, and operating WTG were observed [including Supervisory Control and Data Acquisition (SCADA) system displays at local stations (located at the WTG) and a remote station (located in the KCPL transmission substation)].

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 a new unit is "fully operational and used for service." Please see my direct testimony filed on August 8, 2006, for a detailed description of what in-service criteria are designed to accomplish.

Appendix H from the Stipulation and Agreement in Case No. EO-2005-0329 contains the in-service criteria and is attached to this testimony as Schedule 1.

Q. Were there performance guarantees in the contract?

A. Yes.

Q. Has the Staff evaluated Spearville utilizing the established in-service criteria?

A. Yes.

Q. What were the results of those evaluations?

A. The results are consistent with the established in-service criteria. The results of the evaluations are summarized in Schedule 2.

Q. Were there any significant deviations during the performance of the evaluations that should be discussed?

A. No.

Q. What is your conclusion regarding in-service criteria for Spearville?

A. Based on my review and analysis of the data and inspection of the facilities, Spearville has met all of the required in-service criteria. Therefore, I recommend that the Spearville Wind Energy Facility be considered fully operational and used for service.

Q. Does this conclude your true-up direct testimony?

A. Yes, it does.

In-Service Test Criteria

Coal Plant In-Service Test Criteria

1. Unit must demonstrate that it can operate at its design minimum load or above.

   Hours at or above design minimum load / 400 hours >= 0.80

2. Unit must be ale to operate at or above its design capacity factor for a reasonable period of time. If the design capacity factor is not specified it will be assumed to be 0.60 unless the utility can offer evidence justifying a lower value.

   Design capacity factor <= energy generated for a continuous period of 168 hours / (design full load X 168 hours)

3. Unit must operate at an average capacity equal to 98% of its design maximum continuous rating for four (4) hours.

4. Unit must be operated so as to show a clear and obvious trend toward the predominate use of coal as it primary fuel. Test period will be thirty (30) days. The following items will be used as an indication of the trend for coal operation.

   a) Boiler control tuning completed such that the unit can operate safely with all controls systems in auto.

   b) Ash build up in the furnace and backpass areas shall be monitored and be within expected levels.

   c) All boiler/turbine interlocks shall be proven to work as designed.

   d) Sootblowing timing and sequences shall be set properly to clean the tube areas.

   e) All critical alarms brought into the control room shall be operational and functioning properly.

f) At the end of the test period, oil burn levels, if applicable, will be at or near design levels while burning coal.

g) Oil ignitors are functioning in accordance with specifications.

5. Unit must have successfully completed all major equipment startup test procedures.
6. Sufficient transmission interconnection facilities shall exist for the total plant design net electrical capacity at the time the newest unit is declared fully operational and used for service.
7. Sufficient transmission facilities shall exist for KCPL's share of the total plant design net electrical capacity from the generating station into the KCPL service territory at the time the newest unit is declared fully operational and used for service.
8. Equipment installed to comply with emission requirements shall be operational and demonstrate the ability to remove 93% or more of the NOX, SO_2, particulate, and mercury emissions they were installed to remove over a continuous four (4) hour period while operating at or above 95% of its design load. This equipment shall also be required to demonstrate that it is able to remove 88% or more of these same emissions it was installed to remove over a continuous 120 hour period while operating at or above 80% of its design load.

Note: Items 4.f and 4.g above reference oil burn levels and oil ignitors. It is understood that oil is not utilized as a supplemental fuel or an ignition fuel at Hawthorn 5. To verify the intent of Items 4.f and 4.g, natural gas consumption records and documentation of the use of natural gas for ignition should be reviewed.

Wind Turbine In-Service Test Criteria

1. All major construction for each of the units to be considered for inclusion in rate base shall be completed.
2. All preoperational tests for each of the units to be considered for inclusion in rate base shall be completed.
3. Unit has operated at several different wind speeds and delivered power output near or in excess of anticipated output based on guaranteed power curve while vibrations are within design limits. The analysis necessary to meet this requirement will involve: 1) taking the guaranteed power curve for each of the unit types and dividing the range of design wind speeds into three (3) equal ranges of wind speeds, 2) reviewing wind speed data vs. power output for each of the units being evaluated, 3) confirming that each of the units being evaluated had a power output of 95% or more of guaranteed output for the wind speed observed in at least two (2) of the three (3) wind speed ranges noted above with at least one point at or above the 50% design wind speed, and 4) confirming that each of the units being evaluated did not exhibit any unusual vibration outside of design specification requirements.
4. The operational testing required in item 3 above shall be conducted on the first five (5) units constructed and if all five (5) operate in an acceptable manner as described in item 3 above, testing will only be required on every other unit built thereafter at each particular wind generation site utilizing these exact unit types. If any of the units tested during the period where every other unit is being tested fails to operate in an acceptable manner as described in item 3 above, the next five (5) units installed

will be required to be tested and operated in an acceptable manner as described in item 3 above before testing can resume on an every other unit basis again.

5. Unit rotor lock or brake has been checked and confirmed to be installed correctly for each of the units considered for inclusion in rate base.
6. Sufficient transmission interconnection facilities shall exist to carry the total net electrical capacity from the completed number of generating units into the distribution/transmission system.
7. Only units that have been constructed and are operating in an acceptable manner as described in item 3 above shall be considered for inclusion in rate base. Units under construction or that have been constructed but have not met these in-service criteria will not be considered for inclusion in rate base, until such time units have met in-service criteria.

Combustion Turbine Unit In-Service Test Criteria (Nameplate Capacity of 95 MW or Less)

1. All major construction is completed.
2. All pre-operational tests have been successfully completed.
3. Unit will successfully demonstrate 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 will normally be operated.
4. If unit has fast start capability, unit will demonstrate the ability to meet fast start criteria.

5. Unit will successfully demonstrate the ability to initiate the proper shutdown sequence from full load resulting in zero (0) rpm (or turning gear) when prompted at a location (or locations) from which it will be normally operated.
6. Unit will successfully demonstrate the ability to operate at minimum load for one (1) hour.
7. Unit will successfully demonstrate the ability to operate at or above 98% of peak load for one (1) hour, after adjusting for ambient conditions.
8. Unit will successfully demonstrate its ability to operate at or above 98% of base load for four (4) hours, after adjusting for ambient conditions.
9. Unit will successfully meet all operational guarantees.
10. Sufficient transmission interconnection facilities shall exist for the total plant design net electrical capacity at the time the newest unit is declared fully operational and used for service.
11. Sufficient transmission facilities shall exist for KCPL's share of the total plant design net electrical capacity from the generating station into KCPL service territory at the time the newest unit is declared fully operational and used for service.

Combined Cycle Unit In-Service Test Criteria

1. Major construction work and pre-operational tests have been successfully completed such that the combined cycle unit may be operated and successfully complete criteria items 2 through 7.

2. All contract performance guarantee testing will be successfully performed in accordance with the contracts for the combustion turbine, the steam turbine, and the heat recovery steam generators.
3. The combined cycle unit will demonstrate its ability to startup from turning gear operation to nominal capacity on natural gas fuel when prompted by the operator.
4. The combined cycle unit will demonstrate its ability to shut down from minimum load resulting in turning gear operation when prompted by the operator.
5. The combined cycle unit will demonstrate its ability to operate at minimum load for one (1) hour on natural gas fuel.
6. The combined cycle unit will demonstrate its ability to operate at or above 95% of nominal capacity for four (4) continuous hours on natural gas fuel, after adjusting for ambient conditions. During this test the unit will demonstrate its ability to operate at or above 98% of its nominal capacity for one (1) hour, after adjusting for ambient conditions.
7. The combine cycle unit must be able to operate at or above its design capacity factor for a reasonable period of time. If the design capacity factor is not specified it will be assumed to be 0.60 unless the utility can offer evidence justifying a lower value.

   Design capacity factor <= energy generated for a continuous period of 168 hours / (design full load X 168 hours)
8. Sufficient transmission facilities shall exist to carry the total design net electrical capacity of the combined cycle unit to KCPL's distribution/transmission system.
9. Combustion turbine unit which is equipped to operate in any of the following modes will demonstrate its ability to operate in the applicable modes before the equipment

costs associated with these operation modes will be considered for inclusion in the rate base.

a) Generator operating as a synchronous condenser at rated speed and turbine operating at turning gear speed.

b) Startup of gas turbine driven by the generator and frequency converter.

c) Shutdown of gas turbine alone without the generator,

In-Service Criteria for Unit Which is Operational

1. Unit must have adequate recent operational history (January 2003 through December 2005). Unit shall be considered for this review if the unit has been operational for at least six (6) months and has at least 500 hours of operation.
2. Staff will review all unit operational data available to determine if a specific in-service test criterion can be met without operating the unit.
3. If data is inadequate, the unit will be run to meet the specific deficient in-service test criterion.

In-Service Test Criteria

KCPL—Spearville Wind Energy Facility

67--1.5 MW General Electric wind turbines (located near Spearville, Kansas)

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1. All major construction for each of the units to be considered for inclusion in rate base shall be completed.

   Based on review of the Foundation Completion Certificates, Electrical Commissioning Certificates, and Mechanical Completion Certificates for each of the wind turbine generators (WTG); construction was completed prior to September 30, 2006. Also, based on personal observations of the facility on September 27 and 28, 2006; all major construction of the WTG was completed by September 30, 2006 (end of the true-up period).

2. All preoperational tests for each of the units to be considered for inclusion in rate base shall be completed.

   Based on review of the WTG Commissioning Certificates and WTG Substantial Completion Certificates for each of the wind turbines; preoperational tests were completed prior to September 30, 2006.

3. Unit has operated at several different wind speeds and delivered power output near or in excess of anticipated output based on a guaranteed power curve while vibrations are within design limits. The analysis necessary to meet this requirement will involve: 1) taking the guaranteed power curve for each of the unit types and dividing the range of design wind speeds into three (3) equal ranges of wind speeds, 2) reviewing wind speed data vs. power output for each of the units being evaluated, 3) confirming that each of the units being evaluated had a power output of 95% or more of guaranteed output for the wind speed observed in at least two (2) of the three (3) wind speed ranges noted above with at least one point at or above the 50% design wind speed, and 4) confirming that each of the units being evaluated did not exhibit any unusual vibration outside of design specification requirements.

   Based on a review of the power curve for each wind turbine, all the units met this criterion. The power curves are computer plots consisting of the guaranteed power curve and superimposed data points from actual operation of the wind turbine. The horizontal axis of the plot is wind speed (measured in meters per second) and the vertical axis is power output (kilowatts). All units had operational data points in at least two (2) of the three (3) wind speed ranges and delivered a power output greater than 95% of guaranteed power output in at least two (2) of the three (3) ranges [including at least one (1) data point above the 50% design wind speed].

The wind turbines contain two (2) vibration sensors. One (1) sensor monitors vibration associated with the rotating equipment (blades, rotor hub, rotor shaft, gearbox, coupling, and generator). The second sensor monitors vibration associated with the tower structure. Either of the vibration sensors can shut down the wind turbine if its setpoint is exceeded. Since the wind turbines were operating successfully during the time periods the power curves were developed, it can be inferred that the vibrations were not outside of design requirements. Additionally, the Field Commissioning Acceptance Test Checklists for verification of proper operation of the vibration sensors were reviewed for all of the wind turbines.

4. The operational testing required in item 3 above shall be conducted on the first five (5) units constructed and if all five (5) operate in an acceptable manner as described in item 3 above, testing will only be required on every other unit built thereafter at each particular wind generation site utilizing these exact unit types. If any of the units tested during the period where every other unit is being tested fails to operate in an acceptable manner as described in item 3 above, the next five (5) units installed will be required to be tested and operate in an acceptable manner as described in item 3 above before testing can resume on an every other unit basis again.

   This criterion is not applicable. All of the units were tested and test results have been provided and reviewed.

5. Unit rotor lock or brake has been checked and confirmed to be installed correctly for each of the units to be considered for inclusion in rate base.

   Based on review of Field Commissioning Acceptance Test Checklists for validating secondary brake operation for each of the wind turbines; the brakes have been checked and confirmed to be installed correctly.

6. Sufficient transmission interconnection facilities shall exist to carry the total net electrical capacity from the completed number of generating units into the distribution/transmission system.

   Kansas City Power & Light (KCPL) is currently utilizing firm and non-firm transmission service to deliver the power produced at the Spearville Wind Energy Facility (Spearville) to KCPL customers. KCPL is working with the Southwest Power Pool (SPP) in the aggregate study process. This process should result in Spearville being designated as a network resource and thus able to serve KCPL customers under SPP rules.

7. Only units that have been constructed and are operating in an acceptable manner as described in item 3 above shall be considered for inclusion in rate base. Units under construction or that have been constructed but have not met these in-service criteria will not be considered for inclusion in rate base, until such time units have met in-service criteria.

   Based on review of the Project Substantial Completion Certificate and Electrical Substantial Completion Certificate, the sixty seven (67) wind turbines located at the Spearville Wind Energy Facility have been constructed and are operating in an acceptable manner.