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MISSOURI PUBLIC SERVICE COMMISSION
UTILITY OPERATIONS DIVISION
TRUE-UP DIRECT TESTIMONY
OF
NOUMVI G. GHOMSI
KANSAS CITY POWER & LIGHT COMPANY
FILE NO. ER-2010-0355

Jefferson City, Missouri
February 2011

KCP&L 306

Staff Exhibit No. KCP&L-295
Date 3/3/11 Reporter SNB
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OF

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TRUE-UP DIRECT TESTIMONY

OF

NOUMVI G. GHOMSI

KANSAS CITY POWER & LIGHT COMPANY

FILE NO. ER-2010-0355

Q. Please state your name and business address.

A. Noumvi G. Ghomsi, Governor Office Building Suite 700, 200 Madison Street,
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 I 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-Columbia with a Bachelor of
Science degree in Industrial & Manufacturing Engineering and an Associate's degree in
Business Administration in December 2007. I interned as a Utility Engineer for the School of
Engineering Industrial Assessment Center (IAC) at the University of Missouri-Columbia from
June 2006 to February 2008. While working for the IAC I helped conduct energy audits as
well as researched and developed new solutions for private businesses to improve their energy
efficiency and increase their operational capacity. After graduation I worked as a Process
Engineer for Hallmark Cards Metamora Fixtures Operation from March 2008 to June 2009.
While at Hallmark Cards, I worked in various departments including engineering, operations,
distribution, quality, and environmental health and safety (EHS). In addition to these specific
department functions; my work experience also consisted of project management, process

1 improvement events, time-studies, quality control, procurement, research and development,
2 creating work orders and manufacturing instructions, and completing managerial requests.
3 During my employment with Hallmark Cards, I also participated on the Industrial Safety &
4 Green Teams. The tasks for both teams included monthly safety inspections on plant-wide
5 equipment and hazardous material, as well as providing energy efficient solutions for the
6 Manufacturing and Distribution departments. In July 2010 I began my employment with the
7 Commission.

8 **EXECUTIVE SUMMARY**

9 Q. Please provide an executive summary of your testimony.

10 A. This testimony details the in-service criteria review for thirty-two (32) Kansas
11 City Power & Light Company (KCPL) wind turbine generators (WTGs) at the Spearville
12 Wind Energy Facility in Spearville, Kansas known as Spearville II. Each of these WTGs at
13 Spearville II have satisfactorily met the in-service criteria established in File No. ER-2010-
14 0355 and Staff recommends the Commission find they are "fully operational and used for
15 service."

16 **PROJECT DESCRIPTION**

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

18 A. The Spearville Wind Energy Facility is located near Spearville, Kansas
19 (approximately 15 miles northeast of Dodge City, Kansas). The site consists of
20 approximately 5,500 acres of land. The facility originally had 67 General Electric wind
21 turbine generators (1.5 MW each) for a nominal electrical capacity of 100.5 MW. They are
22 now known as Spearville I. KCPL has added 32 additional General Electric wind turbine
23 generators (1.5 MW each) with a total nominal electrical capacity of 48 MW, which is known

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1 as Spearville II. Therefore the entire Spearville facility (Spearville I and Spearville II) has a
2 total nominal capacity of 148.5 MW. KCPL contracted with MasTec Renewables
3 Construction Company to manage the development and construction of the additional 32 wind
4 turbine generators. The WTGs connect to the Southwest Power Pool, Inc. (SPP) through
5 Sunflower Electric, Inc.'s Spearville substation (adjacent to the KCPL transmission
6 substation). The status of the WTGs at Spearville II, with regard to the Staff's in-service
7 criteria was reviewed before the end of the true-up period (December 31, 2010).

8 Q. Have you personally visited Spearville II?

9 A. Yes. I visited the site on December 17, 2010, with Greg Brossier of the
10 Energy Department Staff and John Robinett of the Engineering & Management Services
11 Department Staff. During the site visit, we reviewed folders for each WTG at the site to
12 verify compliance with the in-service requirements. The review revealed that five (5) WTGs
13 still needed to be commissioned by means of a 6-hour test. The test generates a power curve,
14 which is used in determining a pass or fail of in-service criteria number three (3). In addition
15 to our findings, four (4) wind turbine generators were missing brake test documentation.
16 KCPL provided electronic copies of all in-service test criteria documentation by the end of the
17 True-Up period, the final documents being received on December 27, 29, and 30. I also
18 analyzed a one-line diagram layout of the SPP Interconnection, which designated the location
19 of the new 32 WTGs. The diagram indicates that there is extra transmission capacity for more
20 than the 148.5 MW currently being generated at the Spearville Wind Energy Facility. I
21 observed operating WTGs and Supervisory Control and Data Acquisition (SCADA) system
22 displays at local stations (located at the WTG). I also observed an inventory of WTG spare

1 parts at the site, along with maintenance equipment used to gain access to all WTG service
2 roads.

3 **IN-SERVICE CRITERIA**

4 Q. What are in-service criteria?

5 A. In-service criteria are a set of operational tests or operational requirements
6 developed by Staff to determine whether a new generating unit is "fully operational and used
7 for service." Appendix H from the Stipulation and Agreement in Case No. EO-2005-0329
8 contains Staff's in-service criteria used for the WTGs at Spearville II.

9 Q. Where does the phrase "fully operational and used for service" come from?

10 A. The phrase comes from Section 393.135, RSMo. 2000, a statute that was
11 adopted by Initiative, Proposition No. 1, on November 2, 1976. Section 393.135, RSMo.
12 2000, provides as follows:

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

19
20 Q. How did Staff develop the in-service test criteria it used for these WTGs at
21 Spearville II?

22 A. The criterion were developed in a collaborative process with KCPL and others,
23 and approved by the Commission as part of KCPL's Experimental Regulatory Plan (Case No.
24 EO-2005-0329).

25 Q. Why are in-service criteria important?

26 A. The criteria established in Case No. EO-2005-0329 provides an accepted basis
27 for in-service evaluation. In-service criteria are the operational basis upon which Staff makes

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1 its determination to recommend to the Commission that it finds a generation unit to be "fully
2 operational and used for service" and be given ratemaking treatment.

3 Q. Were there performance guarantees in the General Electric (GE) contract?

4 A. Yes.

5 Q. Has the Staff evaluated Spearville II utilizing the in-service criteria from
6 KCPL's Experimental Regulatory Plan?

7 A. Yes.

8 Q. Relative to the in-service criteria, what were the results of those evaluations?

9 A. The results are consistent with the established in-service criteria. The results
10 of the evaluations are summarized in Schedule-1.

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

13 A. No.

14 Q. What is your conclusion regarding in-service criteria for the WTGs at
15 Spearville II?

16 A. Based on my review and analysis of the data and inspection of the facilities,
17 the WTGs at Spearville II have met all of the required in-service criteria. Therefore, I
18 recommend that the Commission find the WTGs at Spearville II "fully operational and used
19 for service."

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

21 A. Yes, it does.

In-Service Test Criteria

KCPL—Spearville II Wind Energy Facility

32--1.5 MW General Electric Wind Turbines

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 December 31, 2010. Also, based on personal observations of the facility on December 17, 2010; all major construction of the WTG was completed by December 31, 2010 (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 wind turbine; preoperational tests were completed prior to December 31, 2010.

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 the 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 set-point 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.

All 32 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 operations 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 Company (KCPL) is still 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 additional thirty-two (32) wind turbines located at the Spearville Wind Energy Facility have been constructed and are operating in an acceptable manner.