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Witness: Curt Wells
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MISSOURI PUBLIC SERVICE COMMISSION

UTILITY OPERATIONS DIVISION

DIRECT TESTIMONY

OF

CURT WELLS

KANSAS CITY POWER & LIGHT COMPANY

CASE NO. ER-2006-0314

**Jefferson City, Missouri
August 2006**

FILED

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Missouri Public
Service Commission

~~Staff~~ Exhibit No. 141
Case No(s). ER-2006-0314
Date 10-16-06 Rptr X9

**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 CURT WELLS

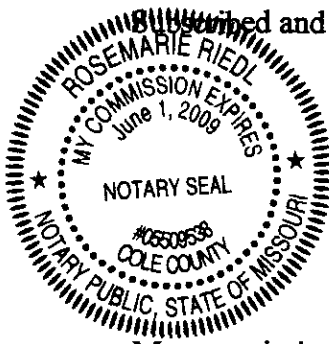
STATE OF MISSOURI)
) ss
COUNTY OF COLE)

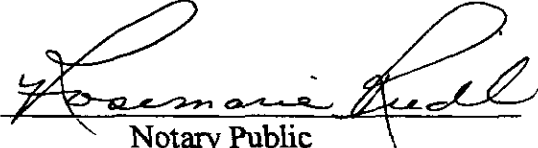
Curt Wells, of lawful age, on his oath states: that he has participated in the preparation of the following Direct Testimony in question and answer form, consisting of 10 pages of Direct Testimony to be presented in the above case, that the answers in the following Direct Testimony were given by him; 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.



Curt Wells

Subscribed and sworn to before me this 4th day of August, 2006.





Notary Public

My commission expires June 1, 2009

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DIRECT TESTIMONY

OF

CURT WELLS

KANSAS CITY POWER & LIGHT COMPANY

CASE NO. ER-2006-0314

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DIRECT TESTIMONY

OF

CURT WELLS

KANSAS CITY POWER & LIGHT COMPANY

CASE NO. ER-2006-0314

Q. Please state your name and business address.

A. My name is Curt Wells and my business address is Missouri Public Service Commission, P. O. Box 360, Jefferson City, Missouri, 65102.

Q. What is your present position with the Missouri Public Service Commission (Commission)?

A. I am a Regulatory Economist in the Electric Department of the Utility Operations Division.

Q. Please review your educational background and work experience.

A. I have a Bachelor's degree in Economics from Duke University, a Master's degree in Economics from The Pennsylvania State University, and a Master's degree in Applied Economics from Southern Methodist University. I have been employed by the Missouri Public Service Commission since February, 2006. Prior to joining the Commission, I completed a career in the U.S. Air Force, which included assignments as a navigator in weather reconnaissance aircraft, and later in the Purchasing/Contracting area as Contract Negotiator and Administrator, Contracting Policy Manager, Installation Purchasing Department Chief, and Contracting Program Manager.

Q. Have you filed testimony in prior cases?

Direct Testimony
Of Curt Wells

1 A. I filed testimony in The Empire District Electric Company's general electric
2 rate increase case now pending before the Commission, Case No. ER-2006-0315, on the issue
3 of Revenues.

4 **EXECUTIVE SUMMARY**

5 Q. Please summarize your testimony.

6 A. In my testimony I address two different issues. First, I discuss the weather
7 data used in this case by explaining (a) what data is needed to arrive at normal (average)
8 temperatures for the Kansas City area for this rate case, (b) what temperature data is
9 available, (c) why the available temperatures need to be adjusted, and (d) how these
10 adjustments are made. Second, I present a schedule showing the annualized, normalized, and
11 growth-adjusted Missouri rate revenues that Staff is using in its determination of revenue
12 requirement for Kansas City Power & Light Company (KCP&L) in this case.

13 **WEATHER**

14 Q. What weather data did the Staff need in this case?

15 A. Because the weather-related demand for electricity is driven primarily by
16 temperature, the Staff needed temperature data. The data the Staff used in determining
17 "normal" temperatures in this rate case are daily maximum and minimum temperatures at the
18 Kansas City weather station—now located at Kansas City International Airport (KCI)—over
19 the 30-year period 1971-2000 used by the National Oceanic and Atmospheric Association
20 (NOAA) and the World Meteorological Organization (WMO) with adjustments to correct for
21 any inconsistencies or biases. In his direct testimony, Staff witness Shawn E. Lange will
22 explain how he applied this information in this case.

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1 Q. What are normal temperatures?

2 A. As stated by NOAA in its publication, Climatology of the United States No
3 81, Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree
4 Days, 1971-2000, Missouri, "A climate normal is defined, by convention, as the arithmetic
5 mean of a climatological element computed over three consecutive decades (WMO, 1989)."
6 NOAA applies this concept to temperature by calculating thirty-year temperature normals as
7 monthly average maximum temperature and monthly average minimum temperature, using
8 the Fahrenheit scale.

9 Q. What period does NOAA use for calculating its thirty-year temperature
10 normals?

11 A. NOAA uses the three most recent consecutive decades, which are currently the
12 thirty years ending December 31, 2000. International agreements among members of the
13 WMO, and its predecessor, the International Meteorological Committee, have established
14 that three-decade periods are appropriately long and uniform periods for the calculation of
15 normals. NOAA recalculates thirty-year normals at the end of each decade as a way of
16 dealing with changes in measurement conditions and changes in the climate itself. The 1971-
17 2000 normals were published in December 2001.

18 Q. Why did you use temperatures from the Kansas City weather station?

19 A. The temperatures the Staff and KCP&L used in this case originate from the
20 Kansas City weather station since it best represents weather in KCP&L's service territory in
21 Missouri, and because the Kansas City weather station is a first order weather station. This
22 means that it is staffed by professional observers, and that its temperatures have been
23 adjusted for changes in instruments and instrument location (exposure changes).

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1 Q. What temperature data is available from the Kansas City weather station?

2 A. Actual (unadjusted) maximum and minimum daily temperatures for the 30-
3 year normals period (1971-2000) are available from NOAA internet sources such as the
4 Midwest Climate Information Service and the National Climatic Data Center. NOAA also
5 provides adjusted monthly maximum and minimum temperatures for this time period in a file
6 known as the NOAA Sequentials. This data set consists of average monthly minimum and
7 maximum temperatures for each month over the 30-year normals period, resulting in 360
8 entries. The average of these 30 adjusted maximum and minimum temperatures for each of
9 the 12 months constitute NOAA's monthly normal temperatures.

10 Q. Why does NOAA make adjustments to the raw data?

11 A. Over time, weather instruments are moved (both horizontally and vertically),
12 replaced and updated; and observation procedures change. When this occurs, inconsistencies
13 and biases are introduced which must be corrected to ensure a consistent set of temperatures
14 over the time period.

15 Q. Does the temperature data series for the Kansas City weather station include
16 any of these changes?

17 A. Yes. There have been four exposure changes listed since 1971 documented in
18 the 2005 Local Climatological Data Annual Summary with Comparative Data, Kansas City,
19 Missouri. First, the Kansas City weather station was moved in 1972, from the urban river
20 bottom location at the Kansas City Municipal Airport to the current prairie location at KCI.
21 The former urban location was at 742 feet elevation, while the current location is at 1,014 feet
22 elevation. Second, the Annual Summary also includes an entry for a site change of two miles
23 in April 1979. Third, there was a thermometer type change in October 1984. Finally, the

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1 Automated Surface Observing System (ASOS) was commissioned in July 1995. These
2 exposure changes took place during the 1971-2000 period used to in calculating normal
3 weather.

4 Q. Did NOAA calculate adjustments for the inconsistencies that occurred during
5 the normals period?

6 A. Yes. To ensure accuracy, NOAA calculated monthly adjustments for
7 exposure changes at all first order stations, including the Kansas City station now at KCI, in
8 developing the monthly normals. NOAA calculated these adjustments with reference to
9 monthly average minimum and maximum temperatures at surrounding stations where no
10 exposure changes took place for a sufficient length of time before and after the dates of the
11 exposure change at the Kansas City station. These adjustments were incorporated into the
12 NOAA Sequentials described above.

13
14 **STAFF METHODOLOGY TO ADJUST WEATHER**

15 Q. Given that NOAA has made these adjustments to accurately reflect
16 temperatures over the 30-year normals period, why are the NOAA normals not usable for the
17 Staff's purposes?

18 A. The NOAA adjustments are applied to monthly temperatures over the period
19 so they do not contain sufficient detail for weather-normalizing electricity use. The Staff
20 needs daily temperature normals, because electricity usage varies differently at extreme daily
21 temperatures than it does at mild ones.

22 Q. Is it possible to incorporate the NOAA adjustments into the actual daily
23 minimum and maximum temperatures?

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1 A. Yes. However, for the Staff's normals to correspond to NOAA's normals, in
2 making adjustments to the actual daily temperatures, the Staff methodology requires the
3 monthly average of the adjusted daily temperatures correspond with the NOAA monthly
4 normal temperatures.

5 Q. How is this correspondence insured?

6 A. It is insured by using the NOAA Sequentials as a benchmark for making the
7 daily temperature data consistent with these monthly temperatures over the NOAA normals
8 period.

9 Q. What is the Staff's methodology in calculating adjusted daily temperatures for
10 the thirty-year NOAA normals period?

11 A. The Staff's uses the two NOAA temperature data sets described above to
12 make these calculations. First, is the NOAA Sequentials. These 360 entries (one for each
13 month of the 30 year history) provide the benchmarks for adjusting actual daily temperatures
14 in these months.

15 The second data source is the raw official daily temperatures for the same 30-year
16 time period from NOAA. In this data set, there are a total of 10,958 maximum temperature
17 entries (365 days times 30 years plus 8 leap days) and 10,958 minimum temperature entries
18 from the 1971 to 2000 period. These are the actual daily maximum and minimum
19 temperatures that must be adjusted.

20 Q. How did you use the monthly NOAA Sequentials to make the adjustments to
21 daily temperatures?

22 A. First, for each month in the years 1971 through 2000, I calculated monthly
23 averages of the actual daily temperatures that have to be adjusted. This provides 360

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1 observations containing monthly averages of both actual daily maximum temperature and
2 actual daily minimum temperature.

3 Second, I calculated temperature adjustments for each day of the thirty year
4 period by subtracting each of these monthly maximum and minimum temperature averages
5 from the corresponding daily maximum and minimum temperatures in the original data.

6 Finally, I added the monthly NOAA Sequentials temperatures to each of the
7 adjustments just calculated for each of the days in the thirty year period. These calculations
8 yield 10,958 observations for both the adjusted daily maximum and adjusted daily minimum
9 temperature, over the 360 months in the years 1971 through 2000.

10 Q. How did you make sure that the adjusted daily temperatures correspond to
11 NOAA's normals?

12 A. I first calculated the monthly averages of the daily maximum and minimum
13 temperatures that were adjusted. I then verified that these monthly averages are equal to the
14 benchmarks, which are the monthly sequential temperatures that are used by NOAA to
15 calculate its 30-year temperature normals. I also verified that the monthly averages of the
16 adjusted daily temperatures are equal to NOAA's 12 monthly normal temperatures for the
17 KCI station. The crosschecks were successful in this case, thus insuring that the adjusted
18 daily temperature products supplied to Mr. Lange correspond with the NOAA normals. The
19 calculations and results appear in the computer spreadsheets that make up my workpapers.

20 Q. Are the methods you applied in this case consistent with those used in
21 previous cases?

22 A. Yes. Dr. Wayne Decker, the State Climatologist for Missouri, testified as a
23 witness for the Staff in Case No. GR-92-165 as to the appropriateness of using the NOAA

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1 and WMO "normals" period. The Staff has used this time period and adjusting methodology
2 in all of the electric and gas cases since then.

3 Q. Has the Commission made any findings with respect to the use of NOAA's
4 thirty-year normal?

5 A. Yes. The use of the NOAA 30-year normal and 30-year normals period
6 complies with a provision of the Commission's Report and Order in the Missouri Gas Energy
7 rate case, Case No. GR-96-285. At page 18 of its Report and Order, the Commission stated:
8 "The Commission finds that NOAA's 30-year normals is the more appropriate
9 benchmark... . In addition, the data upon which Staff's recommendation is based has gone
10 through the processes established by NOAA to ensure the best data possible." The 30-year
11 period has been accepted consistently in electric rate cases since then.

12 Q. What period did KCP&L use for calculating thirty-year temperature normals
13 for this case?

14 A. According to the pre-filed testimony of KCP&L witness George M.
15 McCollister, KCP&L used the 30-year period 1971-2000: "Normal weather was derived
16 using spreadsheets provided by MPSC Staff. The normal weather represents average weather
17 conditions over the 1971-2000 time period." (McCollister direct, pg. 4, lines 14-16) Staff
18 witness Lange confirmed this statement.

19 **MISSOURI RATE REVENUE**

20 Q. What did you contribute to the Staff's determination of Missouri rate revenue
21 in this case?

22 A. I compiled Schedule CW-1, which summarizes Staff's computation of
23 KCP&L's annualized, normalized, and growth-adjusted Missouri electric rate revenues for

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1 the 12 months ended December 31, 2005 (test year), updated through June 30, 2006. The
2 revenues shown in this schedule have been developed by me and by Staff witness Kim Bolin.

3 I am responsible for the test year actual revenues and test year weather-normalized
4 revenues shown on Schedule CW-1. Ms. Bolin is responsible for both the growth adjustment
5 to revenues and for the large customer annualization.

6 The total Missouri rate revenue shown in the extreme bottom-right-hand corner of
7 Schedule CW-1 is also shown on Staff Accounting Schedule 9 – Income Statement. These
8 revenues are used in Staff's computation of revenue requirement in this case.

9 Q. What method did you use to compute KCP&L's actual Missouri electric rate
10 revenues?

11 A. KCP&L provided Staff with actual test year rate revenue by month, by rate
12 code, and by billing method. I first aggregated the monthly actual revenue data by rate class
13 and by voltage level and then aggregated it by test year. The test year totals were then
14 adjusted to equal the Missouri rate revenues shown in KCP&L's 2005 Missouri supplement
15 to FERC Form 1.

16 My adjustments were to add the unbilled revenue and miscellaneous adjustments
17 shown in the Missouri supplement to the FERC Form 1 and to correct for over-stated lighting
18 revenue in December 2005.

19 Q. What method did you use to compute KCP&L's Missouri weather-normalized
20 rate revenues?

21 A. KCP&L computed and provided Staff with weather-normalized test year rate
22 revenue by month and by rate code in compliance with Appendix I in Case No. EO-2005-
23 0329 (KCP&L Regulatory Plan). I reviewed the submitted data by comparing the revenue

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1 per kilowatt-hour (kWh) of each KCP&L rate class to revenue per kWh of similar rate groups
2 at other electric utilities. As a consequence, I chose to accept the bulk of the Company's
3 weather normalization rate revenue results but did adjust it for certain revenue omissions in
4 KCP&L's Proof of Revenue Summary.

5 Weather normalized Missouri rate revenues are shown on column 4 of Schedule CW-
6 1. The adjustment to revenues due to weather is shown on column 3 of that Schedule, as well
7 as in Staff Accounting Schedules – Schedule 10.

8 Q. Does this conclude your direct testimony?

9 A. Yes, it does.

The Kansas City Power & Light Company - Case No. ER-2006-0314
Summary of Missouri Rate Revenue

	Revenue (as billed)	Weather Adjustment	Normalized Revenue (as billed)	Growth/ Annualization Adjustment	Total Revenue Including Growth/ Annualization
TOTAL LARGE GENERAL SERVICE	\$107,388,912	\$1,329,014	\$108,717,927	\$630,949	\$109,348,875
TOTAL LARGE POWER	\$89,181,312	\$3,707,830	\$92,889,142	\$810,197	\$93,699,339
TOTAL MEDIUM GENERAL SERVICE	\$62,912,498	(\$466,620)	\$62,445,878	\$362,831	\$62,808,710
TOTAL SMALL GENERAL SERVICE	\$36,718,827	(\$35,320)	\$36,683,507	\$166,387	\$36,849,895
TOTAL RESIDENTIAL	\$175,465,535	(\$4,234,685)	\$171,230,850	\$415,752	\$171,646,602
TOTAL LIGHTING	\$2,929,607	(\$141,297)	\$2,788,310		\$2,788,310
Special Contract	\$199,072	(\$17,442)	\$181,630		\$181,630
OTHER RATE REVENUE (Unmetered, manual billing, Peoplesoft, Econ Dev Reduction, Adjustments)	\$11,875,298	(\$33,209)	\$11,842,089		\$11,842,089
Unbilled	\$189,885		\$189,885		\$189,885
TOTAL RATE REVENUE	\$486,860,947	\$108,272	\$486,969,219	\$2,386,116	\$489,355,335