Exhibit No.:
Issue(s): *Production Cost Model*
Witness: *Shawn E. Lange*
Sponsoring Party: *MoPSC Staff*
Type of Exhibit: *Rebuttal Testimony*
Case No.: *ER-2018-0145 and ER-2018-0146*
Date Testimony Prepared: *July 27, 2018*

MISSOURI PUBLIC SERVICE COMMISSION

COMMISSION STAFF DIVISION

ENGINEERING ANALYSIS DEPARTMENT

REBUTTAL TESTIMONY

OF

SHAWN E. LANGE

KANSAS CITY POWER & LIGHT COMPANY
CASE NO. ER-2018-0145

AND

KCP&L GREATER MISSOURI OPERATIONS COMPANY
CASE NO. ER-2018-0146

Jefferson City, Missouri
July 2018

** Denotes Confidential Information **

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Q. Please state your name and business address.

A. My name is Shawn E. Lange and my business address is Missouri Public Service Commission ("Commission"), P.O. Box 360, Jefferson City, Missouri 65102.

Q. Are you the same Shawn E. Lange that provided sections in Staff's Direct report in this proceeding?

A. Yes, I am.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to address the reasonableness of the Company's market prices used in fuel and production modeling.

Q. How did Kansas City Power and Light Company ("KCPL") and KCP&L Greater Missouri Operations Company ("GMO") establish the market prices that they used in fuel and production modeling?

A. Based on KCPL and GMO witness Burton Crawford's Direct Testimony, KCPL and GMO used Ventyx data[1] in the Midas™ model[2] to simulate most of the eastern

[1] Ventyx data is a National database of data that is collected and imputed by Ventyx. This data contains heat rates, ramp rates, and other unit specific generator specific operating properties. This data is generally collected from public sources of information but may be adjusted by Ventyx.

[2] The Midas™ model is an hourly dispatch model in the portfolio of software products that Ventyx offers.

interconnect.[3] As a result of modeling most of the eastern interconnect, a series of market prices are determined based on the National Database[4] characteristics of generation that was dispatched in the simulation.

Q. Do the market prices KCPL and GMO used in this case most reasonably reflect the variation experienced in the Southwest Power Pool ("SPP") Integrated Marketplace ("IM") on an hourly basis?

A. No. Since KCPL and GMO used the same hourly market prices in their respective fuel models, Staff evaluated the market prices that were being used by KCPL and GMO and compared the prices used to calendar year 2015, 2016, and 2017 KCPL Hub Day Ahead prices. The comparison to KCPL Hub price is reasonable because KCPL and GMO are joint owners in Iatan 1 and Iatan 2, have contracts with Osborn and Rock Creek wind farms have many generating units in close proximity to each other as well as an effort by Staff to be consistent with KCPL's and GMO's use of one series of market prices for both cases. Please see the chart below.

continued on next page

[3] The eastern interconnect is electrical footprint consisting of the Grain Belt region of the Midwest extending to the east coast excluding a large portion of Texas.
[4] The National Database is the database of Ventyx data comprised of generators and their operating characteristics. This data is generally collected from public sources of information but may be adjusted by Ventyx.

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The minimum market price used by KCPL and GMO in their direct case(s) in any given hour is ** ___ **. As shown, many KCPL hub prices in 2017 are lower than ** ___ **, with approximately 400 hours of negative market prices and a minimum of ($27.51). For 2016, there are many hours KCPL hub prices are lower than ** ___ **, with a minimum price of ($22.00). Similarly, the maximum market prices used by KCPL and GMO do not approach the maximums actually experienced in the SPP integrated market.

Q. Mr. Crawford states, "the power price forecasts are fairly accurate when the forecasts of natural gas prices are accurate."[5] Does his evaluation consider the hourly variation in prices?

[5] Mr. Burton Crawford Direct pg. 4 ln 20 through ln 21.

A. No. The chart included as Schedule BLC-1 (HC) of Mr. Crawford's direct testimony in ER-2018-0145 and ER-2018-0146, also included as Schedule SEL-r1 (HC), provides values on a monthly basis. ** _____ _____ _____ _____. **

While both simple and weighted monthly averages are important in evaluating the consistency of market power prices, neither of those metrics reasonably account for the hourly variations that exist in power market prices.

Q. If it is possible that the monthly average of actual market prices and KCPL's and GMO's forecast is fairly accurate, why are KCPL's and GMO's hourly prices an issue?

A. KCPL, GMO, and Staff use an hourly dispatch model to determine variable fuel expense. What happens hour to hour and the extremes are important in estimating not only which units will run, but also what margins those units would produce, and how net production costs relate to the costs of obtaining energy to serve load. Having market prices that are dampened, having a minimum higher than what is seen, and a maximum that is lower than what is seen can cause changes to which units get dispatched at what level and thus affect fuel expense.

Q. Has SPP reported on negative market prices?

A. Yes, in the State of the Market report for the fall of 2017, in regard to negative pricing, the Market Monitoring Unit states:

> The Market Monitoring Unit is concerned with the marked increase in the frequency of negative price intervals. Negative prices may not be a problem in and of themselves, they do indicate an increase in surplus energy on the system. This may be

> exacerbated by the practice of self-committing resources in the day-ahead market.[6]

Q. Has 2018 experienced the same level of negative intervals that were present in the test year?

A. No, the Market Monitor unit for SPP states in the State of the Market Spring 2018 report that, "Spring 2018 had about four percent of all asset owner intervals with negative prices, compared to just over five percent spring 2016 and 10 percent in spring 2017."[7] They further state that, "The reduction can be attributed to higher load in the SPP system due to the weather, along with the energizing of Woodward – Tatonga – Matthewson 345kV project, which was completed in February 2018."[8]

Q. How much change in load did SPP experience?

A. Based on the SPP Market monitor in the State of the Market Spring 2018 report:

> Overall, the hourly average load for spring 2018 was just over 28,000 megawatts, which was up nearly eight percent from spring 2017. While March and April 2018 were slightly higher than the prior year, May 2018 average loads were 14 percent higher than 2017. This increase was primarily weather-driven…[9]

This change in load is largely driven by changes in weather.

> During the first four months of 2018, heating degree days were well above normal as compared to prior years. During May 2018, heating degree days dropped below the prior years and the 30 year average. Conversely, cooling degree days in the first four months of 2018 mirrored levels of prior years. However, May 2018 saw a significant increase compared to both prior years and the 30 year average.[10]

[6] https://www.spp.org/documents/56353/spp_mmu_quarterly_fall_2017_v2.pdf Pg. 45.
[7] https://www.spp.org/Documents/58275/SPP_MMU_quarterly_spring_2018.pdf Pg. 29.
[8] https://www.spp.org/Documents/58275/SPP_MMU_quarterly_spring_2018.pdf Pg. 29.
[9] https://www.spp.org/Documents/58275/SPP_MMU_quarterly_spring_2018.pdf Pg. 3.
[10] https://www.spp.org/Documents/58275/SPP_MMU_quarterly_spring_2018.pdf Pg. 4.

The abnormal weather seen in 2018 caused an increase in total MWh in SPP resulting in an increase in market prices. Even with the abnormal weather seen in 2018, there were negative market prices in each month of 2018 included in the State of the Market Spring 2018 report.

Q. Does Staff consider KCPL's and GMO's market prices reasonable in the light of the SPP Market Monitor reports as well as projects in the SPP generation interconnection queue?

A. While KCPL and GMO estimate similar variable fuel costs to those of Staff, KCPL's and GMO's lack of negative market prices in the relied-upon market prices is concerning and undercuts the reasonableness of their fuel and production modeling. In that Staff's market prices more reasonably represent the volatility and negative price potential of the SPP IM, Staff recommends the Commission rely upon Staff's models for estimating variable fuel expense in establishing revenue requirements in these cases.

Q. Does this conclude your rebuttal testimony?

A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Kansas City Power & Light Company's Request for Authority to Implement a General Rate Increase for Electric Service	))))	Case No. ER-2018-0145
		and
In the Matter of KCP&L Greater Missouri Operations Company's Request for Authority to Implement a General Rate Increase for Electric Service	))))	Case No. ER-2018-0146

AFFIDAVIT OF SHAWN E. LANGE

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW SHAWN E. LANGE and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Rebuttal Testimony* and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

Shawn E Lange
SHAWN E. LANGE

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 25th day of July 2018.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: December 12, 2020
Commission Number: 12412070

D Suzie Mankin
Notary Public

SCHEDULE SEL-r1

HAS BEEN DEEMED

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IN ITS ENTIRETY