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Wind Farm Construction Audit*
Witness: *Charles T. Poston, PE*
Sponsoring Party: *MoPSC Staff*
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Case No.: *ER-2021-0312*
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MISSOURI PUBLIC SERVICE COMMISSION

INDUSTRY ANALYSIS DIVISION

ENGINEERING ANALYSIS DEPARTMENT

REBUTTAL TESTIMONY

OF

CHARLES T. POSTON, PE

**THE EMPIRE DISTRICT ELECTRIC COMPANY,
d/b/a Liberty**

CASE NO. ER-2021-0312

*Jefferson City, Missouri
December 20, 2021*

**** Denotes Confidential Information ****

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**TABLE OF CONTENTS OF
REBUTTAL TESTIMONY OF
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ASSUMED NATURAL GAS PRICES IN PRODUCTION COST MODELS 2
KINGS POINT WIND FARM IN-SERVICE CRITERIA..... 6

1 **REBUTTAL TESTIMONY**

2 **OF**

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4 **THE EMPIRE DISTRICT ELECTRIC COMPANY,**
5 **d/b/a Liberty**

6 **CASE NO. ER-2021-0312**

7 Q Please state your name and business address.

8 A. My name is Charles T. Poston and my business address is Public Service
9 Commission, P.O. Box 360, Jefferson City, MO 65102.

10 Q. By whom are you employed and in what capacity?

11 A. I am employed by the Missouri Public Service Commission as a Senior Professional
12 Engineer in the Engineering Analysis Department of the Industry Analysis Division.

13 Q. Are you the same Charles T. Poston, PE who sponsored part of Staff's Cost of
14 Service ("COS") Report filed on October 29, 2021 in this case?

15 A. Yes.

16 Q. What is the purpose of your rebuttal testimony?

17 A. I am responding to the direct testimony of The Empire District Electric Company,
18 d/b/a Liberty ("Empire" or "Company") witness Todd W. Tarter regarding the price of natural gas
19 assumed for the use in production cost modeling in this case. I also provide an update to Staff's
20 recommendation regarding the satisfaction of the in-service criteria at the Kings Point Wind Farm.¹

¹ Case No. ER-2021-0312, Staff Cost of Service Report, Appendix 4 "Construction Audit and Prudence Review,"
page 18-19.

1 **ASSUMED NATURAL GAS PRICES IN PRODUCTION COST MODELS**

2 Q. What effect do natural gas prices have within production cost models?

3 A. The primary effect of natural gas prices in production cost models is to determine,
4 in part, the cost of generating electricity at a natural gas-fired power plant. During the simulation
5 process, the cost to generate electricity will influence when a power plant is dispatched within the
6 market and at what level of generation output it will operate. Many other factors influence the
7 behavior of power plants within the production cost model's simulation, but fuel price is one of
8 the most significant.

9 Q. Please briefly summarize Empire's position regarding the cost of natural gas used
10 in its production cost model.

11 A. Empire witness Todd W. Tarter testified that that weighted average price of natural
12 gas used was "about \$2.09/MMBtu."² Staff examined Empire's workpapers and confirmed that
13 statement to be correct. Empire's natural gas prices were provided by Horizons Energy, a
14 consulting firm that was contracted by Empire to provide input data for its EnCompass production
15 cost model.³

16 Q. Please briefly summarize the position Staff took in its COS report with regard to
17 the natural gas price used in its production cost model.

18 A. The natural gas price used in Staff's production cost model was \$2.42/MMBtu.
19 The calculation of this natural gas price used Empire-specific natural gas costs from the
20 twelve months ending on June 30, 2021, and is based on a weighted average of hedged and

² Case No. ER-2021-0312, Direct Testimony of Todd W. Tarter, page 10, lines 1-2.

³ Case No. ER-2021-0312, Direct Testimony of Todd W. Tarter, page 9, lines 17-21.

1 non-hedged (spot) prices.⁴ This price includes an adjustment to account for the abnormally high
2 natural gas prices experienced during Winter Storm Uri in February 2021.

3 Q. Why are the natural gas prices used by Empire and Staff different?

4 A. Empire's natural gas prices were calculated prior to the filing of Empire's
5 direct testimony on May 28, 2021. Staff's natural gas prices were finalized during the middle of
6 October 2021, four and a half months after Empire filed its direct case. Staff was able to capture
7 and incorporate Empire-specific natural gas price data through June 30, 2021, the end of the
8 ordered update period.⁵ That difference in the time of calculation is critical to understanding the
9 difference in natural gas prices.

10 Q. Why does the time at which the natural gas price was calculated impact the results?

11 A. Since July 2020, the spot price of natural gas has been generally trending upwards.⁶
12 Between the time when Empire filed its direct testimony in May 2021 and Staff's direct testimony
13 in October 2021, the U.S. natural gas market experienced a noticeable increase in spot prices.
14 As a result, the later in the year that price input data is taken from, the higher the calculated natural
15 gas price will be. For reference, the daily Henry Hub spot price from January 2019 to the end of
16 November 2021 is provided below in Figure 1. The Henry Hub is physically located in Louisiana
17 and is an interconnection between thirteen natural gas pipelines. It serves as the pricing point for
18 natural gas futures contracts on the New York Mercantile Exchange (NYMEX). The natural gas

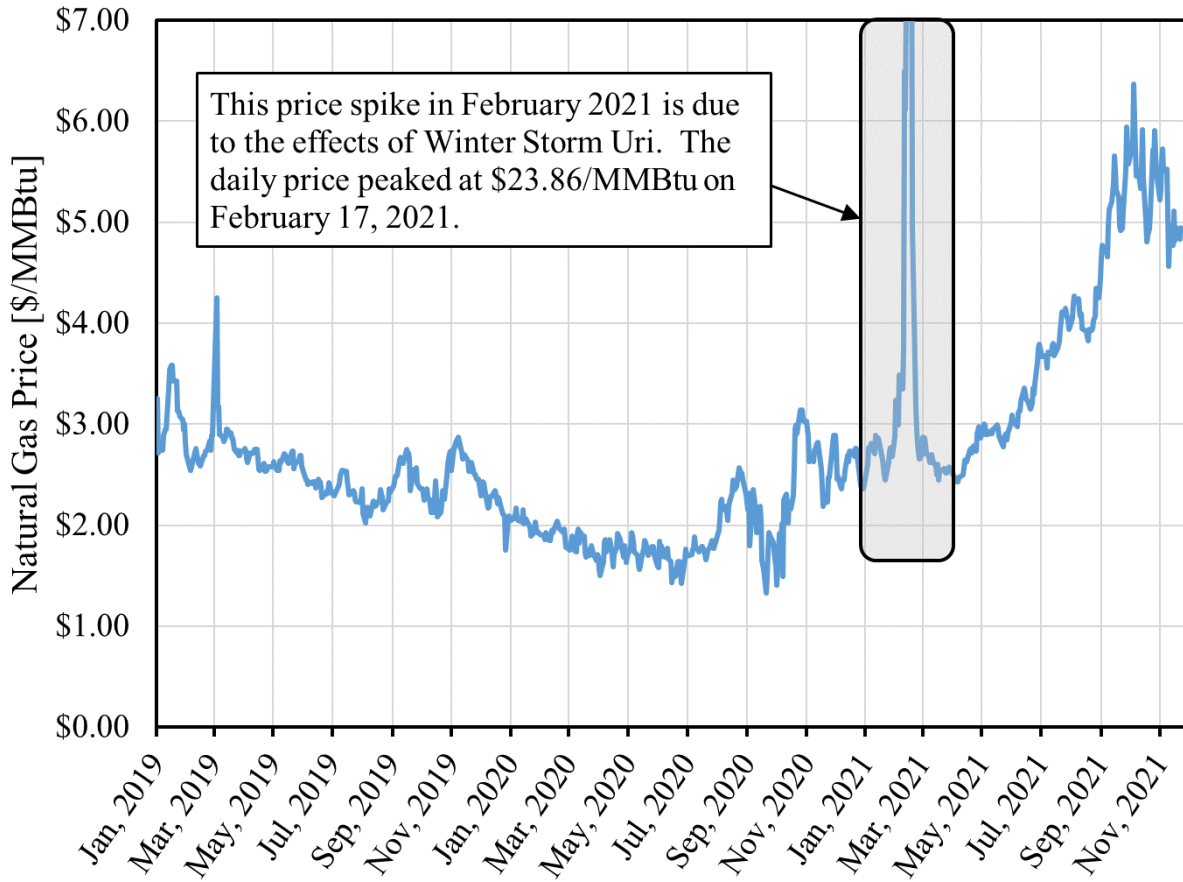
⁴ Case No. ER-2021-0312, Staff Cost of Service Report, page 72, lines 9-23.

⁵ Case No. ER-2021-0312, "Order Establishing Procedural Schedule and Other Procedural Requirements," issued August 4, 2021, page 3.

⁶ For the purposes of this testimony, the spot price of natural gas referenced is at the Henry Hub. Those prices are not identical to those seen by Empire, but are used for illustrative purposes to discuss the general state of the U.S. natural gas market. Henry Hub prices were not used as the data source for Staff's calculated natural gas price in its production cost model.

1 prices at the Henry Hub are used as a reference point to help set natural gas prices throughout
2 North America.

3 Figure 1. Henry Hub Spot Price for Natural Gas (January 2019 – November 2021)⁷



4
5 Q. What would the effect be if Staff updated its natural gas price calculation through
6 the end of September 2021?

7 A. Updated through September 30, 2021, Staff's natural gas price would be
8 \$2.85/MMBtu. This result is expected due to the shift in the time period considered by Staff's
9 updated calculation. By shifting the 12-month period of data that was considered forward in time

⁷ Daily Henry Hub natural gas spot prices retrieved from <https://www.eia.gov>.

1 by three months (from the end of June 2021 to the end of September 2021), more of the higher
2 natural gas prices that were experienced in the second half of 2021 were included in the calculation,
3 driving up the calculated average price. During the summer and fall of 2021, natural gas prices
4 increased significantly, with peaks being seen in excess of \$6.00/MMBtu. However, in recent
5 weeks, Henry Hub spot prices have fallen and have dropped back below \$4.00/MMBtu.

6 Q. What is the impact of Staff's higher recommended natural gas price of
7 \$2.42/MMBtu on the total cost of fuel calculated in Staff's production cost model compared to
8 Empire's recommendation?

9 A. The amounts of natural gas calculated to have been burned in the production cost
10 models created by Staff and by Empire were very similar. Staff calculated a total natural gas
11 consumption of approximately ** [REDACTED] ** while Empire reported a calculated
12 consumption of approximately ** [REDACTED] **. ^{**8} While both models have similar
13 amounts of natural gas consumption, Staff's model with the higher natural gas price calculated a
14 total cost of natural gas of ** [REDACTED] ** vs. ** [REDACTED] ** ^{**9} for Empire, a difference
15 of approximately ** [REDACTED] **. **

16 Q. Why is Staff using a higher natural gas price than Empire when doing so would
17 increase the variable fuel and purchased power expense?

18 A. Staff's position is that it is proper to acknowledge measurable changes in the natural
19 gas market through the use of the most up-to-date natural gas price information that is available
20 within the ordered update period. The schedule for this case allowed Staff to incorporate more

⁸ Case No. ER-2021-0312, Direct Testimony Workpapers of Todd W. Tarter, "2021 MO Rate Case Model Output – FINAL – CONFIDENTIAL.xlsx," "Annual Summary" tab, Cell F23.

⁹ Case No. ER-2021-0312, Direct Testimony Workpapers of Todd W. Tarter, "2021 MO Rate Case Model Output – FINAL – CONFIDENTIAL.xlsx," "Costs" tab, Cell N141.

1 recent data than was available to Empire when it filed its direct testimony. Staff found that natural
2 gas prices were trending upwards and so its calculated fuel price ended up higher than Empire's.
3 However, if it had been the case that natural gas prices had been steady or falling, Staff's natural
4 gas price could have be equal to or lower than price used by Empire.

5 Q. How does the variable fuel and purchased power expense calculated with Staff's
6 production cost model affect the Fuel Adjustment Clause ("FAC") base factor?

7 A. The variable fuel and purchased power expense is an input into the calculation of
8 the FAC Base Factor. All other factors being equal, higher natural gas prices generally result in
9 higher fuel expenses. If natural gas prices are assumed to be too low, a mismatch between the
10 calculated and actual cost of fuel could result in an FAC Base Factor that is not set correctly.
11 If the actual energy costs experienced by Empire and its customers were higher than assumed in
12 the FAC, such a condition would work counter to the goal of minimizing the total costs billed to
13 customers through the FAC.

14 Q. What is Staff's recommendation regarding the natural gas price to be used in
15 production cost modeling within this case?

16 A. At this time, Staff continues to recommend that the calculated natural gas price of
17 \$2.42/MMBtu from its COS report be used to determine Empire's variable fuel and purchased
18 power expense.

19 **KINGS POINT WIND FARM IN-SERVICE CRITERIA**

20 Q. In Appendix 4 to Staff's Cost of Service report, you stated that Staff had not yet
21 confirmed that the in-service criteria for the Kings Point Project had been met. Has Staff updated
22 its position on that issue?

1 A. Yes. Since the filing of Staff’s direct COS report, Empire has provided additional
2 information¹⁰ related to issues impacting the satisfaction of the in-service criteria for the Kings
3 Point Project. Those issues and their resolution are discussed below.

4 Q. In the COS report, you mentioned transformer failures as an issue affecting Kings
5 Point.¹¹ Has this issue be addressed by Empire?

6 A. Yes. In September 2021, a voltage transformer in the Kings Point substation failed
7 and briefly took the entire wind farm offline. This was a repeat of a failure that first occurred in
8 February 2021.¹² The September failure was resolved by an Empire substation maintenance crew
9 in approximately five hours with minimal labor expense.

10 Following the initial failure in February, the affected transformer was sent to the original
11 equipment manufacturer for examination. That investigation concluded that the transformer
12 failure was either due to a manufacturing defect or electrical transients on the transmission system.
13 Due to the two failed transformers coming from different productions lots, it was determined that
14 a manufacturing defect was less likely to be the cause of the failures. Therefore, Empire has chosen
15 to continue its investigation of the issue through reviews of events at the Kings Point and
16 La Russell substations. It is also deploying power quality monitoring equipment to watch for
17 transmission system electrical transients. Electrical transients are rapid power surges that may
18 cause momentary increases or decreases in the voltage or current on the transmission system.
19 Transients can cause damage to the insulation or windings of the voltage transformers and lead to
20 premature failures.

¹⁰ Supplemental information was provided by Empire’s response to Staff Data Request Nos. 0181, 0284, 0305, and 0381.

¹¹ Case No. ER-2021-0312, Staff Cost of Service Report, Appendix 4 “Construction Audit and Prudence Review,” page 18.

¹² Case No. ER-2021-0312, Empire Response to Staff Data Request No. 0283.

1 Q. Do you have any remaining concerns about the failures of the voltage transformers
2 in the Kings Point substation as they relate to the in-service status of the wind farm?

3 A. No. Empire has taken reasonable steps to address the transformer failures. The
4 voltage transformer in question is not an expensive component and Empire has demonstrated that
5 it can be replaced quickly by company personnel with spare parts that are already available in case
6 of any future failures. Additionally, Empire has continued to show a good faith effort to expand
7 its investigation in an effort to prevent recurrence.

8 Q. Has Empire provided sufficient documentation to demonstrate that the remaining
9 in-service criteria for Kings Point¹³ have been met?

10 A. Yes. Staff has reviewed the construction reports provided by Empire as ordered in
11 EA-2019-0010, the mechanical completion checklists for all 69 turbines, the commissioning
12 certificates for all 69 turbines, turbine punch lists, performance data from 10% of turbines,
13 substation testing reports, and wind farm operating data.¹⁴ Following the completion of Staff's
14 review of that information, Staff recommends that the Kings Point Project be considered fully
15 operational and used for service as of May 5, 2021.¹⁵

16 Q. Does this complete your rebuttal testimony?

17 A. Yes.

¹³ Case No. EA-2019-0010, Non-unanimous Stipulation and Agreement, Appendix A.

¹⁴ Case No. ER-2021-0312, Empire Responses to Staff Data Requests No. 0181 and 0381.

¹⁵ Case No. ER-2021-0312, Empire Response to Staff Data Request No. 0305.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of the Request of The Empire)
District Electric Company d/b/a Liberty for) Case No. ER-2021-0312
Authority to File Tariffs Increasing Rates for)
Electric Service Provided to Customers in its)
Missouri Service Area)

AFFIDAVIT OF CHARLES T. POSTON, PE

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW CHARLES T. POSTON, PE, and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Rebuttal Testimony of Charles T. Poston, PE*; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

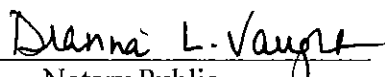


CHARLES T. POSTON, PE

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 16th day of December, 2021.

DIANNA L. VAUGHT
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: July 18, 2022
Commission Number: 15207373



Notary Public