

*Exhibit No.:*  
*Issue(s):* Revenue - Weather  
*Witness:* Seoung Joun Won, PhD  
*Sponsoring Party:* MoPSC Staff  
*Type of Exhibit:* Surrebuttal Testimony  
*Case No.:* GR-2019-0077  
*Date Testimony Prepared:* July 10, 2019

**MISSOURI PUBLIC SERVICE COMMISSION**

**COMMISSION STAFF DIVISION**

**TARIFF/RATE DESIGN**

**SURREBUTTAL TESTIMONY**

**OF**

**SEOUNG JOUN WON, PhD**

**UNION ELECTRIC COMPANY,  
d/b/a AMEREN MISSOURI**

**CASE NO. GR-2019-0077**

*Jefferson City, Missouri  
July 2019*

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OF  
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UNION ELECTRIC COMPANY,  
d/b/a AMEREN MISSOURI  
CASE NO. GR-2019-0077**

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1 **SURREBUTTAL TESTIMONY**

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6 **CASE NO. GR-2019-0077**

7 Q. Please state your name and business address.

8 A. My name is Seoung Joun Won and my business address is Missouri Public  
9 Service Commission, P. O. Box 360, Jefferson City, Missouri 65102.

10 Q. Who is your employer and what is your present position?

11 A. I am employed by the Missouri Public Service Commission (“Commission”)  
12 and my title is Regulatory Economist III in the Tariff and Rate Design Department of the  
13 Commission Staff Division.

14 Q. Are you the same Seoung Joun Won who prepared the Weather Variables  
15 section of Staff’s Cost of Service Report (“Staff Report”) and Staff’s Rebuttal Testimony?

16 A. Yes, I am.

17 **EXECUTIVE SUMMARY**

18 Q. What is the purpose of your surrebuttal testimony?

19 A. The purpose of my surrebuttal testimony is to address issues with the weather  
20 variables that Union Electric Company d/b/a Ameren Missouri (“Ameren Missouri” or  
21 “Company”) witness Mr. Ryan P. Ryterski addressed in his rebuttal testimony.

22 Q. Which aspects of the weather variables used by Mr. Ryterski are you going  
23 to address?

1           A.     I am addressing two issues: (1) the complexity of the ranked average method  
2 for calculating Staff's weather normals, and (2) the volatility of Staff's normal heating degree  
3 days ("HDD").<sup>1</sup>

4     **COMPLEXITY**

5           Q.     What did Mr. Ryterski address about the complexity of Staff's ranked  
6 average method?

7           A.     Mr. Ryterski insists that Staff's method for calculating normal weather is too  
8 complex even though both Staff and the Company's methods produce very similar overall  
9 results. In lines 14-18 on page 11 of his rebuttal testimony, Mr. Ryterski states,

10                   Ameren Missouri does employ the rank and average methodology  
11 when creating weather adjustments for its electric business because that  
12 **complexity** is appropriate due to the more complex modeling of the  
13 electric system used to establish net energy costs in the revenue  
14 requirement. For revenue normalization purposes only, though,  
15 it is **overkill**. [Emphasis added.]

16           Q.     Do you agree with the opinion of Mr. Ryterski?

17           A.     No, I do not agree for two reasons. The first reason is that it is not true that the  
18 electric system used a more complex model than the gas system. The second reason is that  
19 Staff's ranked average method is not overkill but is necessary and appropriate.

20           Q.     Why is it not true that the electric system used a more complex model?

21           A.     Each electric and gas utility has a unique system used to establish net energy  
22 costs in the revenue requirement so that it is not directly comparable. Furthermore, Staff's

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<sup>1</sup> Where MDT < 65°F, HDD = 65 – MDT; otherwise, HDD = 0.

1 model of the weather normalization of gas usage is more complex than that of electric usage  
2 because Staff needs to calculate the billing cycle HDD for each billing month.

3 Q. Why does the billing cycle HDD make a more complex model?

4 A. In gas rate cases, weather normalization is an adjustment procedure to calculate  
5 the normal gas usage that would have occurred if the test year had experienced normal weather.  
6 In this procedure, a regression model is used to estimate the relationship between gas usage and  
7 weather. For the input data of the regression model, Ameren Missouri only provides the  
8 monthly data for 21 billing cycles and not the daily or hourly data because of the gas usage data  
9 availability. However, each billing cycle has a distinctive meter reading schedule with billing  
10 start date and billing end date for each billing month. Therefore, there is a more complex model  
11 to account for billing cycles than the simple model of daily based electricity usage. In addition,  
12 if normal HDD is calculated as the Company's dated average method, the relationship between  
13 normal HDD and gas usage could be broken.

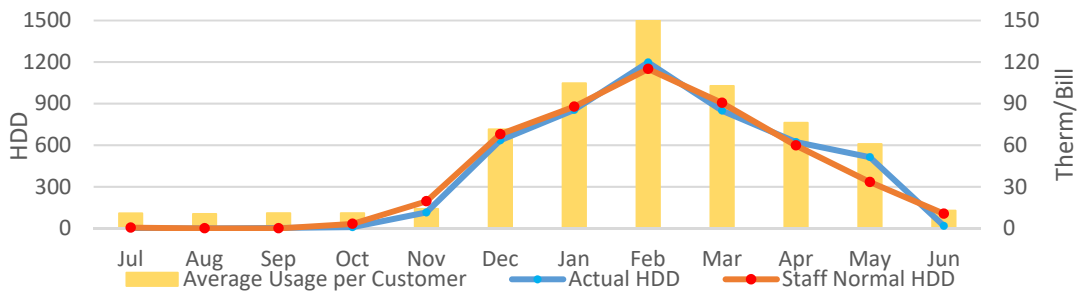
14 Q. What was the relationship between gas usage and HDD?

15 A. The relationship between gas usage and HDD is a positive correlation. In other  
16 words, customer gas usage increases when HDD increases because of cold weather.  
17 The relationship can be explained using the Company's current rate case data. Figure 1 and  
18 Figure 2 present a comparison of actual gas usage, actual HDD, and Staff's normal HDD from  
19 the Columbia Regional Airport ("COU") and the Cape Girardeau Municipal Airport ("CGI"),  
20 respectively. The associated billing cycle gas usage data for each service region is taken from  
21 the residential class in the test year July 2017 through June 2018.

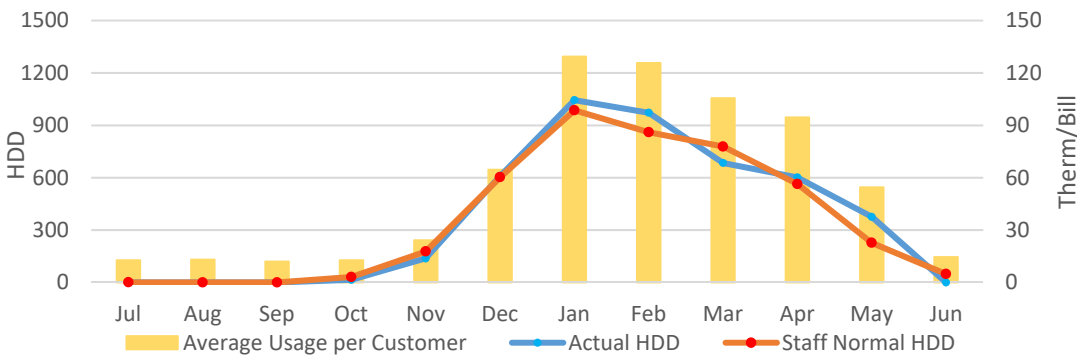
22 As shown in Figure 1 and Figure 2, residential customer gas usage is strongly correlated  
23 to the associated actual HDD. In Figure 1, the gas usage of the February billing month is the

1 highest during the test year because the February billing cycles of Figure 1, which covers a  
2 31-day period from December 29, 2017 through January 29 2018, had the highest actual HDD  
3 in COU.

4 Figure 1. Actual and Normal HDD and Residential Gas Usage of COU



6 Figure 2. Actual and Normal HDD and Residential Gas Usage of CGI



7  
8 In contrast, Figure 2 shows the highest gas usage happened in the January billing month because  
9 the January billing cycles of Figure 2, a 31-day period from November 30, 2017 through  
10 January 2, 2018, had the highest actual HDD in CGI. Therefore, in accordance with the weather  
11 normalization procedure, the gas usage adjustment should be calculated based on proper  
12 relationship between usage and weather. A more detailed explanation about Staff's regression  
13 model of weather normalization is explained in Staff witness Robin Kliethermes' rebuttal  
14 testimony.

15 Q. Why do you think that Staff's ranked average method is not overkill?

1           A.     Not only is Staff's ranked average method not excessive, it is necessary and  
2 appropriate. As explained above, Staff's method properly preserves the relationship between  
3 gas usage and weather. Moreover, the procedure of calculating Staff's normal demands no  
4 additional effort beyond any other method because the only requirement of Staff's procedure is  
5 to update actual weather data in Staff's weather data file. Staff's weather data file is an excel  
6 file, provided to Ameren Missouri as workpapers in this case, that automatically calculates  
7 Staff's ranked average normal HDD.<sup>2</sup>

8           Q.     Had the automated excel file actually been used for any gas cases?

9           A.     Yes. Staff has used the automated excel file for previous gas cases including rate  
10 cases GR-2017-0215 for Spire East, GR-2017-0216 for Spire West, and GR-2018-0013 for  
11 Liberty. Specifically, these 3 gas utilities used the automated excel file for calculating weather  
12 normalization adjustment rider ("WNAR") adjustments.

13          Q.     Were there any gas cases where the Commission ordered the utility to use Staff's  
14 ranked average method for calculating normal HDD?

15          A.     Yes. In Page 13, Report and Order of gas cases GO-2019-0058 of Spire East,  
16 Spire Missouri, Inc., and GO-2019-0059 of Spire West, Spire Missouri, Inc., the Commission  
17 stated:

18                   The Commission finds that the tariff sheets to adjust Spire's WNAR  
19 rate should be rejected and that Spire should file tariff sheets based on  
20 **Staff's ranked method** for determining daily normal weather.  
21 [Emphasis added.]

22           **VOLATILITY**

23          Q.     What did Mr. Ryterski address about the volatility of Staff's normal?

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<sup>2</sup> Staff Engineer Shawn E. Lange formulated the excel file.

1           A       Mr. Ryterski insists that Staff's method introduces unnecessarily additional  
2 volatility for calculating normal weather. In lines 3-5 on page 12 of his rebuttal testimony,  
3 Mr. Ryterski states,

4                   An additional issue with the rank and average methodology is that,  
5 when applied to data associated with usage as billed by utilities across  
6 multiple billing cycles in a month, it tends to produce **additional**  
7 **volatility** in monthly results. Across the course of a whole year, results  
8 associated with both methodologies will be similar, but there is no need  
9 to introduce **additional volatility** to the calculation that will make  
10 period to period comparisons more difficult, as would be the case using  
11 the rank and average approach in the WCAR. [Emphasis added.]

12           Q.       Do you agree with the opinion of Mr. Ryterski?

13           A.       No. Staff's ranked average normal HDD properly preserves the variation of  
14 actual HDD so that it minimizes unnecessary adjustments of gas usage. Ameren Missouri's  
15 normal HDD produces additional volatility in weather normalization adjustments of gas usage  
16 because it smooths away the natural variation in actual HDD.

17           Q.       How does Staff's ranked average normal preserve the variation of actual HDD?

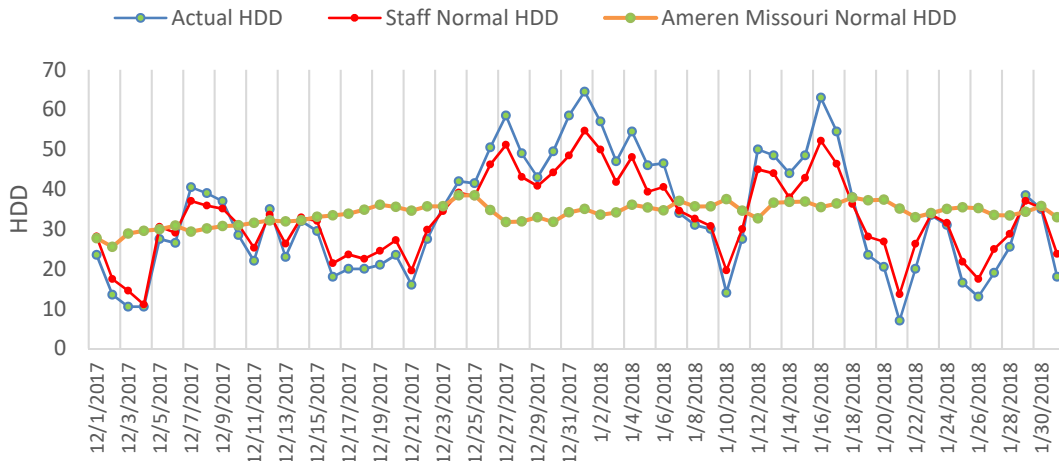
18           A.       As a result of the ranking process, the highest normal HDD in the month is  
19 assigned to the date with the highest actual HDD in the month of the test year. The second  
20 highest normal HDD is assigned to the date with the second highest actual HDD in the month  
21 of the test year, and so forth. Therefore, the rank of Staff's normal HDD is the same as the rank  
22 of actual HDD for any given date in the month.

23                   Figure 3 and Figure 4 show that there is a positive correlation between Staff's daily  
24 normal HDD and daily actual HDD of the test year, but no discernable relationship between  
25 increases and decreases in the Company's daily normal HDD and the value of the daily actual  
26 HDD. The lines created by the different sets of data are not close to having the same shape in

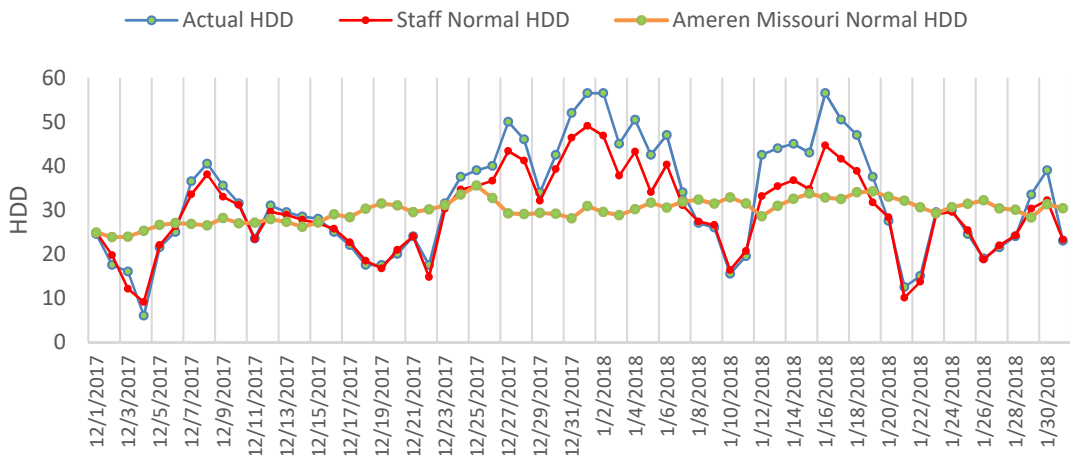


1 the figure. In summary, the variations of actual HDD and Staff's normal HDD is synchronized  
2 but the Company's normal HDD shows variations that are not relevant to the test year weather.  
3 In other words, the statistical relationship between usage and HDD is broken if Ameren  
4 Missouri's method is used.

5 Figure 3 Daily HDD Comparison in COU



7 Figure 4 Daily HDD Comparison in CGI



8  
9 Q. How does Ameren Missouri's normal HDD introduce unnecessary volatility in  
10 weather normalization adjustments?

A. The weather normalization adjustment is proportional to the weather deviation ratio (“WDR”); that is the ratio of the difference between normal HDD and actual HDD to normal HDD.<sup>3</sup> In other words, if other conditions are the same, a bigger deviation of actual HDD from normal HDD will produce a greater weather normalization adjustment. In Figure 5 and Figure 6, Staff’s WDR and Ameren Missouri’s WDR of 21 billing cycles during the January billing month are compared:

Figure 5. The WDR Comparison of COU

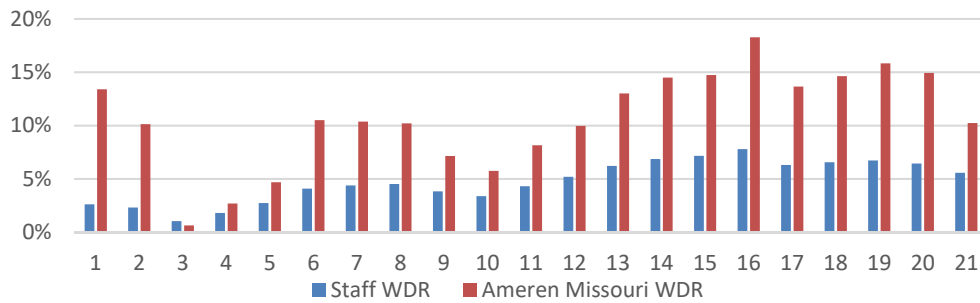
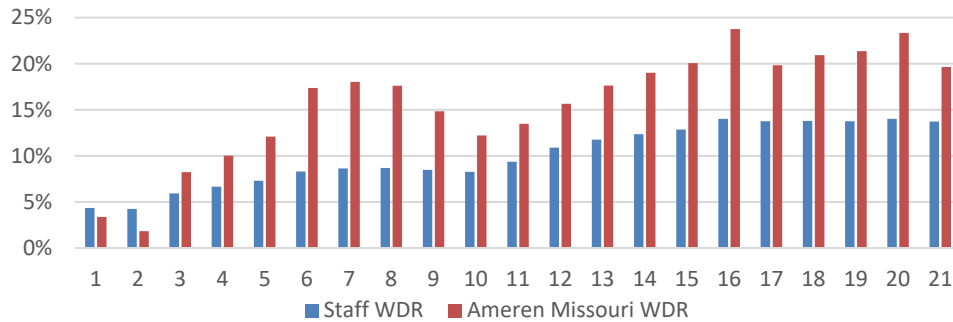


Figure 6. The WDR Comparison of CGI



As seen in Figure 5 and Figure 6, weather data in both COU and CGI shows that Ameren Missouri’s WDR is greater than Staff’s WDR for most of the billing cycles. This means that Ameren Missouri’s normal HDD for weather normalization adjustments will tend to produce additional volatility.

<sup>3</sup> WDR = (Normal HDD – Actual HDD) / Normal HDD.

1 **CONCLUSION**

2 Q. What is the conclusion of your rebuttal testimony?

3 A. Staff's normal HDD is not complex or difficult because of Staff's automatic  
4 formula driven excel file. In addition, Staff's normal HDD produces less volatility for a weather  
5 normalization mechanism than Ameren Missouri's normal HDD. For normal HDD  
6 calculations, Staff recommends the Commission order Ameren Missouri to utilize Staff's  
7 ranked average method.

8 Q. Does this conclude your surrebuttal testimony?

9 A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Union Electric Company        )  
d/b/a Ameren Missouri's Tariffs to Increase    )  
its Revenues for Natural Gas Service         )       Case No. GR-2019-0077

**AFFIDAVIT OF SEOUNG JOUN WON, PhD**

STATE OF MISSOURI        )  
  )  
COUNTY OF COLE         )       ss.

**COMES NOW SEOUNG JOUN WON, PhD** and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Surrebuttal Testimony*; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

  
\_\_\_\_\_  
SEOUNG JOUN WON, PhD

**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 8<sup>th</sup> day of July 2019.

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

  
\_\_\_\_\_  
Notary Public