Exhibit No.:
Issues: Variable Cost
Witness: Sarah L. Kliethermes
Sponsoring Party: MO PSC Staff
Type of Exhibit: Rebuttal Testimony
Case No.: EC-2014-0224
Date Testimony Prepared: May 9, 2014

MISSOURI PUBLIC SERVICE COMMISSION

REGULATORY REVIEW DIVISION

REBUTTAL TESTIMONY

OF

SARAH L. KLIETHERMES

NORANDA ALUMINUM, INC., et al,
COMPLAINANT,
v.
UNION ELECTRIC COMPANY, d/b/a AMEREN MISSOURI
RESPONDENT

CASE NO. EC-2014-0224

Jefferson City, Missouri
May 2014

** **Denotes Highly Confidential Information** **

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BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

Noranda Aluminum, Inc., et al,	)	
	)	
Complainants,	)	
	)	
v.	)	Case No. EC-2014-0224
	)	
Union Electric Company, d/b/a Ameren Missouri	)	
	)	
	)	
Respondent.	)	

AFFIDAVIT OF SARAH L. KLIETHERMES

STATE OF MISSOURI)
) **ss**
COUNTY OF COLE)

Sarah L. Kliethermes, of lawful age, on her oath states: that she has participated in the preparation of the following Rebuttal Testimony in question and answer form, consisting of 14 pages of Rebuttal Testimony to be presented in the above case, that the answers in the following Rebuttal Testimony were given by her; that she has knowledge of the matters set forth in such answers; and that such matters are true to the best of her knowledge and belief.

Sarah Kliethermes

Sarah L. Kliethermes

Subscribed and sworn to before me this 7th day of May, 2014.

SUSAN L. SUNDERMEYER
Notary Public - Notary Seal
State of Missouri
Commissioned for Callaway County
My Commission Expires: October 03, 2014
Commission Number: 10942086

Susan L. Sundermeyer

Notary Public

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OF

SARAH L. KLIETHERMES

NORANDA ALUMINUM, INC., et al, COMPLAINANT,
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AMEREN MISSOURI RESPONDENT

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UNION ELECTRIC COMPANY d/b/a
AMEREN MISSOURI RESPONDENT

CASE NO. EC-2014-0224

Q. Please state your name and business address.

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

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

A. I am employed by the Missouri Public Service Commission ("Commission") and my title is Regulatory Economist III, Economic Analysis Section, Tariff, Safety, Economic and Engineering Analysis Department, Regulatory Review Division.

Q. What is your educational background and work experience?

A. I completed a Bachelor of Science degree in Historic Preservation from Southeast Missouri University in Cape Girardeau, Missouri, and a Juris Doctorate degree from the University of Missouri, Columbia. I have been employed by the Missouri Public Service Commission since May 2006. Prior to transferring to the Economic Analysis Section in July 2013, I was a Senior Counsel in the Staff Counsel's Office. A copy of my credentials and case experience is attached as Schedule SLK-1.

EXECUTIVE SUMMARY

Q. What items do you address in this testimony?

A. I will respond to the calculation of a variable rate as provided in the Direct Testimonies of Maurice Brubaker and James Dauphinais on behalf of Noranda Aluminum, Inc. ("Noranda"). In particular, I will identify the following amounts:

1. A reasonable estimate of Ameren Missouri's wholesale cost of energy for sale to Noranda, which is ** _____ ** per MWh,[1] at Noranda's meter, or about $132,500,000 - $143,500,000 per year;[2]
2. An estimate of a charge per MWh to Noranda at which other customers' rates would be unaffected by Noranda leaving or remaining on Ameren Missouri's retail service at a discounted rate, and a discussion of the reasonableness of using such a rate if it falls below the variable cost of providing service; and
3. An estimate of a rate that would provide the level of benefit to other Ameren Missouri customers that Mr. Brubaker discusses in his testimony concerning his proposed $30.00 per MWh rate. That rate is approximately ** _____ ** per MWh.[3]

I will also respond to Mr. Brubaker's estimate of the variable cost of providing service to Noranda, which includes an offset for an allocation of Ameren Missouri's off-system sales margin ("OSSM") revenue.

Q. Are you providing a recommendation as to whether the Commission should order changes to Ameren Missouri's rate design as requested by Noranda?

A. No. I have compiled and analyzed information to assist the Commission in any analysis it may undertake. I also address certain incorrect assertions in the Direct

[1] Selection of different study periods results in a range of amounts. The lower figure is based on a four-year average of LMP prices, which reduces the impact of extreme prices, among other things. However the higher figure based on the 12 months ending April 1, 2014, is also useful in evaluating a reasonable estimate of the ongoing costs of wholesale energy.

[2] These annual approximations are based on rounded results of calculations involving input of highly confidential numbers. All other public versions of my calculations are based on a 12-month average of the most recently published MISO averages and 2014-2015 planning year capacity costs, and highly confidential numbers include or substitute Ameren Missouri's experienced costs for the 12 months ending April 1, 2014. Using public numbers, the estimate is approximately $31.07 – $33.66 per MWh.

[3] Using public numbers, the estimate is approximately $33.61 per MWh.

Testimonies of Maurice Brubaker and James Dauphinais. This testimony is not intended as a recommendation on any policy considerations or legal issues that may be implicated by Noranda's complaint.

Q. What are the results of your analysis?

A. I have determined that the most reasonable historical amount to use as an estimate of Ameren Missouri's wholesale energy cost of providing service to Noranda is approximately **_____ ** per Megawatt-hour (MWh) at Transmission level, or **_____ ** per MWh at Noranda's meter, based on Ameren Missouri's four-year average wholesale cost of energy to provide service to Noranda.[4] I have determined that if Noranda paid a rate of approximately **_____ ** per MWh, other customers' rates would be unaffected by Noranda leaving or remaining on Ameren Missouri's retail service at a discounted rate. Unless any discounted rate is greater than **_____ **, from a rate impact perspective, other Ameren Missouri customers will experience no rate benefit from Noranda's continued receipt of Ameren Missouri retail service. Staff's recommended conditions applicable to discounted service are described in the testimony of Staff Witness Mike Scheperle.[5]

Q. How do these costs and rates compare to Noranda's current and requested rates?

A. Noranda has requested a rate of $30.00 per MWh at Noranda's meter. Noranda's requested rate is below Ameren Missouri's variable cost of service for Noranda. Excluding charges under Ameren Missouri's FAC, Noranda currently pays a rate of

[4] Using public numbers, the wholesale energy cost is approximately $30.02 per MWh at Transmission level, or $31.07 at Noranda's meter.

[5] Using public numbers, all estimates fall below the reasonable range of wholesale energy costs, and are not reasonable to use in setting rates.

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approximately $37.94 per MWh, although the current rate is billed based on various components and not on a MWh-only basis.[6] Including the FAC charge applicable at the time of the filing of this case, Noranda paid a rate of approximately $41.44 per MWh, if evaluated on a per MWh basis.[7]

ASSUMPTIONS AND ANALYSIS

Q. Have you performed a class-cost-of-service study for this case?

A. No. The rate case audit and cost-of-service results necessary to perform a class-cost-of-service study generally takes four months and significant Staff resources. In his rebuttal testimony in this case Staff witness Michael Scheperle presents the results of Staff's class-cost-of-service study in Ameren Missouri's last general rate proceeding, Case No. ER-2012-0166.

Similar to Mr. Dauphinais, I used Ameren Missouri's wholesale cost of energy through the Midcontinent Independent System Operator ("MISO") to determine a reasonable estimate of Ameren Missouri's cost of energy for providing retail service to Noranda.

Primarily, I have applied historical MISO Day-Ahead Locational Marginal Prices ("LMP") to Noranda's historical load. I have made reasonable allowance for other costs associated with serving this load. Public versions of these numbers are based on a 12-month average of the most recently published MISO averages and 2014-2015 planning year capacity costs, and highly confidential numbers include or substitute Ameren Missouri's experienced costs for the 12 months ending April 1, 2014. I have also relied on amounts presented by Mr. Dauphinais to make allowances for MISO Tariff Schedule 26-A Multi-Value Project charges.

[6] Brubaker Direct, P. 2, L. 20 – P.3, L. 1. I have not attempted to verify Mr. Brubaker's calculation.
[7] Brubaker Direct, P. 3, L. 1 – 2. I have not attempted to verify Mr. Brubaker's calculation.

Q. Is further study of certain assumptions warranted?

A. Yes, if allowed by time and resources. For example, like Mr. Dauphinais, I have not attempted to determine an hourly-integrated LMP that would account for real-time deviations. Also, relying on assumptions included in Mr. Dauphinais's analysis and described in his testimony, I have assumed that LMPs would not be affected by the loss of Noranda's load. I concur with Mr. Dauphinais's analysis described in his direct testimony that the MISO energy component of the LMP would not be noticeably impacted by the loss of the Noranda load. I do not have information or the necessary modeling software available to analyze whether it is reasonable to conclude that the congestion and loss components of the MISO LMP would not be noticeably impacted by loss of the Noranda load. For purposes of this analysis, it is reasonable to assume that, all else being equal, the loss of the load would not increase marginal congestion in the Ameren Missouri zone, but further study may be warranted if time and resources allow.

Q. What is the cause of the increase in average LMP for the 12 months ending April 1, 2014 over the 4-year average?

A. I have not conducted an analysis of this change in average LMP. It is reasonable to assume some level of the increase is attributable to weather, which is not likely to directly impact market prices going forward, and some level may be attributable to market changes, which may impact market prices going forward.[8]

Q. Is your analysis reasonable for use in this case without further study of the impact of the loss of the Noranda load on LMP, particularly the congestion component of LMP?

[8] The MISO South region was integrated into the MISO in mid-December, 2013.

A. Yes. The depth of my analysis is consistent with or exceeds that of Mr. Dauphinais. My primary purpose is to identify the variable cost to Ameren Missouri of supplying retail service to Noranda. This analysis is unaffected by any hypothetical loss of the Noranda load.

In addition to my calculation of Ameren Missouri's wholesale cost of providing service to Noranda, I have also estimated the impact on Ameren Missouri's revenue requirement applicable to remaining customers of the loss of the Noranda load using:

1. The level of OSSM and similar benefits allocated to Noranda in Case No. ER-2012-0166,[9]
2. Noranda's retail revenues resulting from rates determined in Case No. ER-2012-0166,
3. An estimate of Ameren Missouri's avoided wholesale energy cost should Noranda cease to receive retail service from Ameren Missouri, and
4. An estimate of the increase in Ameren Missouri's OSSM should Noranda cease to receive retail service from Ameren Missouri.

Items 3 & 4 rely on the assumption that the LMPs in Ameren Missouri's zone would not be noticeably impacted by the loss of Noranda's load or other market impacts. While I have no analysis to support this assumption, I note that Mr. Dauphinais made and relied on the identical assumption in his Actual Net Energy Costs ("ANEC") impact estimate.

Q. Have you prepared any schedules providing this information?

A. Yes.

Schedules	
SLK-2	Hourly DA-LMP Cost Example
SLK-3	NP Energy Cost Calculations
SLK-4	NP Energy Cost and Customer Impact
SLK-5	HC Energy Cost and Customer Impact

[9] Noranda's rates resulting from Case No. ER-2012-0166 did not exactly match its class cost of service as determined by Staff in that case. However, it is reasonable to use the Staff's allocation of OSSM for purposes of determining the rate impact of Noranda's proposal in this case. As discussed more fully by Staff Witness Mike Scheperle, Noranda's rates resulting from that case slightly exceeded its allocated cost-of-service, net of allocated OSSM.

VARIABLE COST

Q. What is Ameren Missouri's variable cost of providing retail service to Noranda?

A. Considering only energy costs, Ameren Missouri's variable cost of providing retail service to Noranda is Ameren Missouri's wholesale cost of energy for sale to Noranda at retail, plus an allowance for other costs assessed to load-serving entities based on load or demand, and any other cost directly assignable to Noranda, adjusted to reflect losses to Noranda's meter.[10]

Q. Do you agree with Mr. Brubaker's testimony at page 5-6:

> Q. ARE RATES THAT ARE DESIGNED TO RETAIN AT-RISK LOADS TYPICALLY PRICED BELOW FULL EMBEDDED COST OF SERVICE?
>
> A. Yes. The concept behind a load retention rate is to retain on the system a load that otherwise might not be served. The basis for such a rate is typically a price above variable cost so that some contribution to fixed costs is provided.
>
> Q. WHAT IS THE AVERAGE VARIABLE COST ASSOCIATED WITH PROVIDING SERVICE TO NORANDA?
>
> A. Based on the final rates adopted in Case No. ER-2012-0166 the average variable cost included in base rates (net base energy costs) is approximately 1.469¢ per kWh. The cost currently is approximately 1.82¢ per kWh because of the existence of a positive FAC factor. Because the 3.0¢ per kWh price to be paid by Noranda is in excess of average variable cost it provides a positive contribution and offset to fixed costs and provides a benefit to other customers.

A. I agree that it is appropriate to charge a rate that is priced above variable cost so that some contribution to fixed costs is provided. I agree that if the choice is between

[10] Generally, the wholesale cost of energy is determined by multiplying the extended and integrated LMP for each hour by Noranda's load, factored to transmission units, for each hour, and summed for a year. That amount would then be divided by Noranda's total MWh usage for that year, to determine Ameren Missouri's variable cost of retail service to Noranda. Absent further study, I do not expect the integration of real time variation to be noticeable on an annual basis, in that this adjustment to the hourly cost would vary in sign in a given hour. Therefore, I did not attempt to integrate the LMP. I have reviewed the impact of extending the LMP to include the cost of ancillary services and uplift necessary to support wholesale energy purchases, and determined that integration of an allowance for these costs is appropriate.

providing service at a rate above variable cost or receiving no additional contribution to fixed costs, that the other customers receive a benefit if the service is provided at a rate above variable cost so that some contribution to fixed costs is made.

Q. Do you agree with Mr. Brubaker's quantification of Ameren Missouri's variable cost to serve Noranda at $18.20 per MWh?

A. No. This amount is only slightly over half of the wholesale hourly integrated and extended cost of a MWh in Ameren Missouri's load zone of the MISO. The net base energy cost referred to by Mr. Brubaker is net of OSSM. For purposes of determining variable cost to provide service, only the wholesale energy **cost** should be considered, and offsetting **revenues** must be excluded.

Q. Have you determined a reasonable quantification of Ameren Missouri's wholesale energy cost for serving Noranda?

A. Yes. I have applied historical MISO Day-Ahead Locational Marginal Prices ("DA LMP") to Noranda's historical load. I have made reasonable allowance for other costs associated with serving load including capacity, and relied on amounts presented by Mr. Dauphinais to make allowances for MISO Tariff Schedule 26-A Multi-Value Project charges in some instances.[11]

Q. What was Ameren Missouri's wholesale energy cost for serving Noranda in the 12 months ending April 1, 2014?

A. A reasonable estimate of Ameren Missouri's wholesale energy cost for serving Noranda for this time period is ** ____ ** per MWh at Noranda's meter.

[11] I have not attempted to incorporate the impact of Ameren Missouri's activities in non-MISO RTOs, nor Ameren Missouri's activities in financial transmission instruments, such as bilateral contracts. I have not attempted to quantify any other costs that are directly assignable to Noranda, such as dedicated customer service personnel, legal costs, or any potential rate recovery related to the Accounting Authority Order resulting from Case. No. EU-2012-0027.

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Q. What is a reasonable estimate of Ameren Missouri's wholesale energy cost for serving Noranda?

A. The most reasonable estimate of Ameren Missouri's wholesale energy cost for serving Noranda is **_____ ** per MWh at Noranda's meter. This is based on a 4-year average of Noranda's load applied to a simple average of the MISO DA LMP for the MISO nodes at Sioux, Taum Sauk, and Osage,[12] with allowance for Ameren Missouri's most recent experienced uplift, ancillary service, and transmission charges, MISO 2014-2015 planning year rates for capacity costs. As seen in the table below of the public versions of these calculations, while selection of different, shorter time periods, presents different amounts, a four-year average reduces the impact of extreme prices, while not being so long a time period as to require a separate adjustment for inflation. Finally, the four-year period ending March 31, 2014, is the longest and most recent for which whole-years' data is available after Noranda returned to full load from the ice storm. However, I do consider the 12 months ending April 1, 2014, in providing several of my recommendations and components of recommendations as within a reasonable range of ongoing costs of wholesale energy.

Average SEMO DA MISO LMPs*	
Time Period	$/MWh
4 years, ending 3/31/2014	$31.12
1 year, ending 7/31/2012	$27.19
1 year, ending 9/30/2013	$27.98
1 year, ending 12/31/2013	$29.26
1 year, ending 3/31/2014	$33.55
*With reasonable allowance for other costs associated with serving load, at Noranda's Meter, weighted for Noranda's load.	

[12] These are the Ameren Missouri MISO generation nodes physically located nearest to the point at which Ameren Missouri provides service to Noranda.

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CUSTOMER IMPACT

Q. Did Mr. Brubaker attempt to quantify the rate impact to other Ameren Missouri customers if Noranda were to cease receipt of Ameren Missouri retail service?

A. Yes. On page 6 of his Direct Testimony, Mr. Brubaker testifies that, "[b]ased on the estimated reduction in Ameren Missouri's Actual Net Energy Costs ("ANEC") provided to me by my colleague Mr. Dauphinais, I have calculated that the net revenue loss if the smelter were not served would be approximately $60 million per year." He continues at pages 6 and 7, "[i]n the scenario where the smelter remains as a retail customer of Ameren Missouri but at a lower rate, the calculated revenue reduction was $33.1 million in base revenues and $14.6 million in FAC, for a total of $47.7 million, or 1.80%. Because this amount is smaller than the $60 million (2.27%) net revenue loss that would be incurred were the smelter not to operate, the requested rate plan also is reasonable when evaluated on this basis."

Q. Do you agree with his analysis of the rate impact on other Ameren Missouri customers if Ameren Missouri ceased to serve Noranda?

A. No. Mr. Brubaker does not properly adjust the remaining retail revenue requirement for existing OSSM that is currently allocated to Noranda, but that would be reallocated among retail classes were Noranda to cease receiving retail service from Ameren Missouri.[13] It appears that Mr. Brubaker fails to consider the line losses that constitute a portion of Noranda's total bill, but would not be a cost to other customers if Noranda ceased receiving Ameren Missouri retail service. I also determine different numbers than

[13] I have not attempted to identify and reallocate the SOx and NOx allowance revenues that are currently allocated to Noranda.

Mr. Dauphinais for Ameren Missouri's cost (and avoided cost) of energy for provision to Noranda.

Q. What should be considered in determining the rate impact on other Ameren Missouri customers if Ameren Missouri ceased to serve Noranda?

A. I recommend that the Commission review the net impact of changes in the revenue requirements of Ameren Missouri's other retail classes. The increases to the other retail classes' revenue requirement are:

1. Loss of Noranda retail rate revenues – approximately $158,000,000.[14]

The decreases to the other retail classes' revenue requirement are:

1. OSSM revenues currently allocated to Noranda – approximately $40,000,000.[15]
2. Avoided wholesale energy cost[16] – approximately $133 to $144 million.[17]

Q. What is your calculation of the rate impact on other Ameren Missouri customers if Ameren Missouri ceased to serve Noranda?

A. Based on the variable cost calculation described above, I would expect the other customers to experience a rate impact in the range of a $9,500,000 to $20,300,000 increase if Noranda left the Ameren Missouri system.[18]

[14] Brubaker Direct, P. 2, L. 20 – P.3, L. 1. I have not attempted to verify Mr. Brubaker's calculation.

[15] Noranda's rates resulting from Case No. ER-2012-0166 did not exactly match its class cost of service as determined by Staff in that case, however, it is reasonable to use the Staff's allocation of OSSM for purposes of determining the rate impact of Noranda's proposal in this case, absent a full cost-of-service study and a full class-cost-of-service study.

[16] Like Mr. Dauphinais, I assume that Ameren Missouri will continue to generate essentially the same amount of energy in the same hours, but that the net OSSM will be changed by a reduction in Ameren Missouri's purchases of energy as a load-serving entity.

[17] This amount is derived from the range established by the most recent 12-month information and the 4-year average LMP application to Noranda load, described above.

[18] Using other estimates of the cost of wholesale electricity for serving Noranda would produce different numbers. It is likely that updating the system-wide OSSM revenue quantification or the determination of new class revenues in a full-blown rate case would also have an impact.

Q. What is your calculation of the rate impact on other Ameren Missouri customers if Ameren Missouri served Noranda at a rate of $30.00 per MWh at Noranda's meter?

A. Based on the variable cost calculation described above, I would expect the other customers to experience an approximate $27,760,000 increase if Noranda paid a rate of $30.00 per MWh at its meter.[19]

Q. Why is the rate impact to customers if Noranda left the Ameren Missouri system less than if Noranda paid a rate of $30 per MWh?

A. Noranda is requesting to purchase energy from Ameren Missouri at a rate that is below the cost to Ameren Missouri of purchasing the energy on the wholesale market, and the difference between those prices is an additional cost to customers. If Noranda receives service at a rate below variable cost, not only is Noranda not contributing to overhead, but it is also increasing the total cost that other ratepayers must provide to Ameren Missouri over the amount that they would pay if Noranda were not a retail customer.

Q. Are you recommending the Commission order Ameren Missouri to cease retail service to Noranda?

A. No.

Q. Relying on the assumptions and quantifications you discuss, can you determine an approximate per MWh retail rate at which the impact of Ameren Missouri's continued provision service to Noranda would be neither better nor worse in terms of the rate impact to other retail customers?

[19] Using other estimates of the cost of wholesale electricity for serving Noranda would produce different numbers. It is likely that updating the system-wide OSSM revenue quantification or the determination of new class revenues in a full-blown rate case would also have an impact.

A. Yes. Using the assumptions and quantifications discussed, if Ameren Missouri provided service to Noranda at a rate of approximately ** _____ ** per MWh at Noranda's meter, other customers' rates would be unaffected by Noranda leaving or remaining on Ameren Missouri's retail service at a discounted rate. This number is based on the higher LMPs associated with the most recent 12-month calculation, but is above the low-end range of a reasonable estimate of Ameren Missouri's ongoing cost of wholesale energy for Noranda.

However, it is not reasonable to set any rate for service below the variable cost of providing that service. To do so would mean that other customers are not only no better off than if Noranda ceased to be an Ameren Missouri customer, but they are worse off because other customers would be bearing a portion of costs incurred to provide service to Noranda, that would not be incurred if Noranda were not a customer.

Some amount greater than **_____ ** is therefore necessary to make a determination that – considering rate impact only – other customers are benefited by Ameren Missouri's continued provision service to Noranda at a discounted rate.

Q. Relying on these same assumptions and quantifications, can you determine an approximate per MWh retail rate at which the impact of Ameren Missouri's continued provision service to Noranda would provide the level of contribution to cost-of-service described by Mr. Brubaker and Mr. Dauphinais in their direct testimonies?

A. Yes. As I understand Mr. Brubaker's calculation, to provide the level of contribution to Ameren Missouri's cost-of-service described in the direct testimonies of Mr. Brubaker and Mr. Dauphinais, Noranda would need to pay a rate of approximately ** _____ ** per MWh[20] at Noranda's meter.[21]

[20] Using public numbers, the estimate is approximately $33.61 per MWh.

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RECOMMENDATIONS

Q. What are your recommendations for the Commission in this matter?

A. I recommend that if the Commission does redesign Ameren Missouri's rates to provide Noranda with an energy-only rate, and consistent with the recommendations of Staff Witness Mike Scheperle, that the Commission:

1. Not consider any rate below Ameren Missouri's variable cost of approximately ** _____ ** per MWh, at Noranda's meter,
2. Not authorize any rate below the rate of ** _____ ** per MWh, at Noranda's meter, at which other customers would experience no rate impact from Noranda's presence on the system, and
3. Be aware that a rate of ** _____ ** per MWh, at Noranda's meter, is necessary to provide other retail customers with the benefits of contribution to Ameren Missouri's cost of service described in the Direct Testimonies of Mr. Brubaker and Mr. Dauphinais.

Q. Does this conclude your testimony in this matter?

A. Yes.

[21] It appears that Mr. Brubaker assumes Noranda would contribute approximately $12.3 million to Ameren Missouri's cost of service, although he does not explicitly address the OSSM offset of approximately $40 million.

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Sarah L. Kliethermes

MoPSC Employment Experience

Regulatory Economist III (July 2013 – Present)
Economic Analysis Section, Energy Unit, Tariff, Safety, Economic and Engineering Analysis Department of the Missouri Public Service Commission. In this position my duties include providing analysis and recommendations in the areas of RTO and ISO transmission, rate design, class cost of service, tariff compliance and design, and energy efficiency mechanism and tariff design. I also continue to provide legal advice and assistance regarding generating station and environmental control construction audits and electric utility regulatory depreciation.

My prior positions in the Commission's General Counsel's Office, which was reorganized as the Staff Counsel's Office, consisted of leading major rate case litigation and settlement and presenting Staff's position to the Commission, and providing legal advice and assistance primarily in the areas of depreciation, cost of service, class cost of service, rate design, tariff issues, resource planning, accounting authority orders, construction audits, rulemakings and workshops, fuel adjustment clauses, document management and retention, and customer complaints. Those positions were:
Senior Counsel (September 2011 – July 2013)
Associate Counsel (September 2009 – September 2011)
Legal Counsel (September 2007 – September 2009)
Legal Intern (May 2006 – September 2007)

Written Testimony

Rebuttal, regarding DSIM tariff design, margin rate calculation, and customer-related issues, in Case No. ER-2014-0095, Kansas City Power & Light application under the Missouri Energy Efficiency Investment Act.

Related Training

Presented *Ratemaking Basics* (Sept. 14, 2012)

Attended:
MISO Markets & Settlements Training for OMS and ERSC Commissioners & Staff (Jan. 27 – 28, 2014)
Validating Settlement Charges in New SPP Integrated Marketplace (July 22, 2013)
PSC Transmission Training (May 14 – 16, 2013)
Grid School (March 4 – 7, 2013)
Specialized Technical Training - Electric Transmission (April 18 – 19, 2012)
Legal Practice Before the Missouri Public Service Commission (Sept. 1, 2011)
Renewable Energy Finance Forum (Sept. 29 – Oct 3, 2010)
The New Energy Markets: Technologies, Differentials and Dependencies (June 16, 2011)
Mid-American Regulatory Conference Annual Meeting (June 5 – 8, 2011)
Utility Basics (Oct. 14 – 19, 2007)

EDUCATION

Studying Economics at Columbia College, Jefferson City campus and online (2013 – Present)
Studying Energy Transmission at Bismarck State University, online (2014 – Present)

Licensed to Practice Law in Missouri, MoBar # 60024 (Summer 2007).

Juris Doctorate, University of Missouri, Columbia, Missouri (2004 – 2007).

Bachelor of Science in Historic Preservation, Cum Laude, minor in Architectural Design, Southeast Missouri State University, Cape Girardeau, Missouri (2002 – 2004).

2000 – 2002: Studied Architecture and English Literature at Drury University, Springfield, Missouri.

OTHER EMPLOYMENT EXPERIENCE

Law Clerk, Contracting and Organization Research Institute. Performed legal research; analyzed, described, and categorized contracts.

Paid Intern, Southeast Missouri State University. Accessioned and organized artifact collections for the Missouri Department of Natural Resources, Division of State Parks and Historic Sites.

Intermediate Clerk, Missouri Department of Elementary and Secondary Education. Responsibilities included organizing and managing various forms of data.

Commodity Chart Data													
Region:	MISO	MISO	MISO						12 Months ending:				
Start History:	3/31/2014	3/31/2014	3/31/2014						5/31/2014				
End History:	4/1/2010	4/1/2010	4/1/2010						3/31/2014	$	30.77		
									12/31/2013	$	26.63		
Source:	MISO	MISO	MISO						9/30/2013	$	25.39		
Price Type:	Hourly Day	Hourly Day	Hourly Day Ahe	Southeast MO									
Location:													
	AMMO.TS1	AMMO.OSA	AMMO.RUSHIS	Average	3 M Avg.	1 Y Avg.	2 Y Avg.	3 Y Avg.	4 Y Avg.			Noranda Load	Noranda Hourly	Noranda 12 Month Rolling Average
Date	ALTE.ROCK(	*ALTE.ROCK(	ALTE.ROCKGEN1	Hourly Day Ahead LMP MISO										
3/31/2014 0:00	24.68	23.43	22.06	23.39	41.04676	30.77326	$ 27.44	$ 27.67	$ 28.42					
3/1/2014 0:00	28.67	27.33	27.71	27 903333	37.958219	29.580992								
2/28/2014 23:00	29.95	30.52	28 91	29.793333	37.958586	29.580048						480,803	14,324,710.75	29.57
2/28/2014 22:00	32.45	33.43	31.13	32 336667	37.954913	29.579218						480,984	15,553,410.01	29.56
2/28/2014 21:00	40.30	40.99	38.73	40.006667	37.949877	29.57839						479,711	19,191,631 20	29.56
2/28/2014 20:00	56.97	69.33	55 36	60.553333	37.941807	29.577248						478,857	28,996,416.05	29.56
2/28/2014 19:00	60.11	68.51	58 39	62 336667	37.924271	29.574094						478,934	29,855,133.44	29.56
2/28/2014 18:00	46.04	52.42	44.76	47.74	37.906597	29.57097						478,405	22,839,034 25	29.56
2/28/2014 17:00	37.83	39.61	36.44	37.96	37.895869	29.569355						480,188	18,227,919 94	29.56
2/28/2014 16:00	36.09	39.41	34 83	36.776667	37.890703	29.567626						479,925	17,650,054 97	29.55
2/28/2014 15:00	36.49	38.35	35.14	36.66	37.886475	29.565795						480,006	17,597,034.79	29.55
2/28/2014 14:00	39.30	41.39	38.03	39.573333	37.882326	29.564028						479,806	18,987,529.72	29.55
2/28/2014 13:00	41.29	43.42	39 95	41.553333	37.876638	29.561869						478,672	19,890,398 22	29.55
2/28/2014 12:00	43.26	47.25	41 97	44.16	37.869024	29.559516						479,329	21,167,188.05	29.55
2/28/2014 11:00	50.45	54.85	48.76	51 353333	37.858866	29.557014						479,430	24,620,305.70	29.54
2/28/2014 10:00	64.90	83.01	63.1	70 336667	37.845002	29.553819						479,511	33,727,177.18	29.54
2/28/2014 9:00	61.91	84.92	60.2	69.01	37.822396	29.548512						479,458	33,087,407.50	29.53
2/28/2014 8:00	84.06	108.43	81 65	91.38	37.800595	29.543398						478,047	43,683,936 66	29.53
2/28/2014 7:00	85.09	131.15	82.48	99.573333	37.768629	29.535714						478,128	47,608,805.17	29.52
2/28/2014 6:00	56.88	63.21	55.56	58.55	37.733279	29.52709						459,607	26,909,982 34	29.51
2/28/2014 5:00	41.92	43.88	40.41	42.07	37.715982	29.52283						477,270	20,078,746 38	29.51
2/28/2014 4:00	35.80	35.96	34 37	35 376667	37.706679	29.520296						479,229	16,953,536.09	29.51
2/28/2014 3:00	35.21	37.20	33 83	35.413333	37.701198	29.518439						479,105	16,966,718 30	29.50
2/28/2014 2:00	39.65	44.03	38 22	40 633333	37.695422	29.516565						477,961	19,421,157.05	29.50
2/28/2014 1:00	40.06	43.86	38.16	40 693333	37.687374	29.514083						474,538	19,310,542 89	29.50
2/28/2014 0:00	41.25	42.53	39 31	41.03	37.679323	29.51162						474,791	19,480,671.15	29.50
2/27/2014 23:00	33.69	38.30	32.06	34 683333	37.670868	29.50915						477,813	16,572,162.08	29.50

DAUPHINIAS ANALYSIS - UNCORRECTED							
	Noranda Units		Rate		Sub Totals		
Net Energy, Transmission Loss and Congestion Costs	4,169,000	MWh	$26.63	per MWh	$111,020,470.00		
Net Capacity Costs	194,377	MW-days	$1.05	per MW-day	$204,095.85		
MISO Tariff Schedule 26-A Multi-Value Project Usage Rate	4,169,000	MWh	$0.37	per MWh	$1,542,530.00		
				Total:	$112,767,095.85		Contribution to Revenue Requirement
Total				Per MWh:	$27.05	$	12,302,904.15

Average LMP Applied to Actual Load for 12 Months ending September 30, 2013 and Addition of Ancillary Services and Uplift							
			Rate		Sub Totals		
Metered Noranda load:	4,169,000	MWh	1.035				
Hourly DA LMPs x Noranda Hourly Load	4,314,915	MWh	25.3894	per MWh	$109,552,889		
Uplift	4,314,915	MWh	0.25	per MWh	$1,078,729	Avg. of published MISO for March 2013 - February 2014	
Ancillary Services	4,314,915	MWh	0.1900	per MWh	$819,834	Avg. of published MISO for March 2013 - February 2015	
MVP Costs	4,314,915	MWh	0.418956	per MWh	$1,807,758		
Capactiy Cost	201,180	MW-days	16.75	per MW-day	$3,369,768	Applicable to 2014-2015 Planning Year	
				Total Energy Cost:	$116,628,978	Contrib. to RR @ $30/MWh	
				Per MWH @ Noranda Meter:	$27.98	$	8,441,022.25

Average LMP Applied to Actual Load for 12 Months ending December 31, 2013 and Addition of Ancillary Services and Uplift							
			Rate		Sub Totals		
Metered Noranda load:	4,169,000	MWh	1.035				
Hourly DA LMPs x Noranda Hourly Load	4,314,915	MWh	26.6331	per MWh	$114,919,778		
Uplift	4,314,915	MWh	0.25	per MWh	$1,078,729	Avg. of published MISO for March 2013 - February 2014	
Ancillary Services	4,314,915	MWh	0.1900	per MWh	$819,834	Avg. of published MISO for March 2013 - February 2015	
MVP Costs	4,314,915	MWh	0.418956	per MWh	$1,807,758		
Capactiy Cost	201,180	MW-days	16.75	per MW-day	$3,369,768	Applicable to 2014-2015 Planning Year	
				Total Energy Cost:	$121,995,867	Contrib. to RR @ $30/MWh	
				Per MWH @ Noranda Meter:	$29.26	$	3,074,133.28

Factored LMP for 12 Months ending March 31, 2014 and Addition of Ancillary Services and Uplift							
			Rate		Sub Totals		
Metered Noranda load:	4,169,000	MWh	1.035				
Hourly DA LMPs x Noranda Hourly Load	4,314,915	MWh	30.7733	per MWh	$132,784,002		
Uplift	4,314,915	MWh	0.25	per MWh	$1,078,729	Avg. of published MISO for March 2013 - February 2014	
Ancillary Services	4,314,915	MWh	0.1900	per MWh	$819,834	Avg. of published MISO for March 2013 - February 2015	
MVP Costs	4,314,915	MWh	0.418956	per MWh	$1,807,758		
Capactiy Cost	201,180	MW-days	16.75	per MW-day	$3,369,768	Applicable to 2014-2015 Planning Year	
				Total Energy Cost:	$139,860,091	Contrib. to RR @ $30/MWh	
				Per MWH @ Noranda Meter:	$33.55	$	(14,790,090.98)

Factored LMP for 4 Years ending March 31, 2014 and Addition of Ancillary Services and Uplift							
			Rate		Sub Totals		
Metered Noranda load:	4,169,000	MWh	1.035				
Hourly DA LMPs x Noranda Hourly Load	4,314,915	MWh	28.4232	per MWh	$122,643,576		
Uplift	4,314,915	MWh	0.25	per MWh	$1,078,729	Avg. of published MISO for March 2013 - February 2014	
Ancillary Services	4,314,915	MWh	0.1900	per MWh	$819,834	Avg. of published MISO for March 2013 - February 2015	
MVP Costs	4,314,915	MWh	0.418956	per MWh	$1,807,758		
Capactiy Cost	201,180	MW-days	16.75	per MW-day	$3,369,768	Applicable to 2014-2015 Planning Year	
				Total Energy Cost:	$129,719,664	Contrib. to RR @ $30/MWh	
				Per MWH @ Noranda Meter:	$31.12	$	(4,649,664.42)

Factored LMP for 12 Months ending July 31, 2012 and Addition of Ancillary Services and Uplift							
			Rate		Sub Totals		
Metered Noranda load:	4,169,000	MWh	1.035				
Hourly DA LMPs x Noranda Hourly Load	4,314,915	MWh	25.6935	per MWh	$110,865,437		
Uplift	4,314,915	MWh	0.07	per MWh	$302,044	Published MISO for December 2012 - February 2013	
Ancillary Services	4,314,915	MWh	0.09	per MWh	$388,342	Published MISO for December 2012 - February 2014	
Dauphinias' Net Capacity & MVP Costs	4,314,915	MWh	0.418956	per MWh	$1,807,758	Applicable to 2013-2014 Planning Year	
				Total Energy Cost:	$113,363,581	Contrib. to RR @ $30/MWh	
				Per MWH @ Noranda Meter:	$27.19	$	11,706,418.64

Average SEMO DA MISO LMPs*	
Time Period	$/MWh
4 years, ending 3/31/2014	$31.12
1 year, ending 7/31/2012	$27.19
1 year, ending 9/30/2013	$27.98
1 year, ending 12/31/2013	$29.26
1 year, ending 3/31/2014	$33.55

*With reasonable allowance for other costs associated with serving load, at Noranda Meter, weighted for Noranda load.

LMP = Ameren Load Node, with Noranda Factor, 12 Months ending April 1, 2014								
				Rate			Sub Totals	
Metered Noranda load:	4,169,000	MWh		1.035				
Average DA LMPs Factored for Noranda Load	4,314,915	MWh	$	30.93000	per MWh		$133,460,321	
Uplift	4,314,915	MWh	$	0.25000	per MWh		$1,078,729	
Ancillary Services	4,314,915	MWh	$	0.19000	per MWh		$819,834	
MVP Costs	4,314,915	MWh	$	0.37000	per MWh		$1,596,519	
Capacity Costs	4,314,915	MWh	$	0.78096	per MWh		$3,369,768	
					Total Energy Cost:		$140,325,170	Contrib. to RR @ $30/MWh
					Per MWH @ Noranda Meter:		$33.66	$ (15,255,170.37)

LMP = SEMO Nodes with Noranda Factor, 4 Years ending March 31, 2014								
				Rate			Sub Totals	
Metered Noranda load:	4,169,000	MWh		1.035				
Average DA LMPs Factored for Noranda Load	4,314,915	MWh	$	28.43275	per MWh		$122,684,898	
Uplift	4,314,915	MWh	$	0.25000	per MWh		$1,078,729	
Ancillary Services	4,314,915	MWh	$	0.19000	per MWh		$819,834	
MVP Costs	4,314,915	MWh	$	0.37000	per MWh		$1,596,519	
Capacity Costs	4,314,915	MWh	$	0.78096	per MWh		$3,369,768	
					Total Energy Cost:		$129,549,747	Contrib. to RR @ $30/MWh
					Per MWH @ Noranda Meter:		$31.07	$ (4,479,747.49)

LMP = Ameren Load Node, with Noranda Factor, 12 Months ending April 1, 2014		LMP = SEMO Nodes with Noranda Factor, 4 Years ending March 31, 2014	
2012 Case - Approximate Allocations		**2012 Case - Approximate Allocations**	
Noranda Allocation of OSSM	$ (40,000,000)	Noranda Allocation of OSSM	$ (40,000,000)
Noranda Energy Allocation	$ 120,000,000	Noranda Energy Allocation	$ 120,000,000
Noranda Plant Allocation	$ 70,000,000	Noranda Plant Allocation	$ 70,000,000
Noranda Balancing Adjustment for Allocation	$ 2,827,612	Noranda Balancing Adjustment for Alloca ion	$ 2,827,612
Approx. Noranda Revenue attributable to line losses	$ 5,344,248	Approx. Noranda Revenue attributable to line losses	$ 5,344,248
Noranda Rate Revenues	$ 158,171,860	Noranda Rate Revenues	$ 158,171,860
Energy Costs and Revenues		**Energy Costs and Revenues**	
Noranda Annual MWh (at MISO)	4,314,915	Noranda Annual MWh (at MISO)	4,314,915
Noranda Annual MWh (at meter)	4,169,000	Noranda Annual MWh (at meter)	4,169,000
Average LMP	30.9300	Average LMP	28.4327
Average Other Charges for Load / MWh	$1 59	Average Other Charges for Load / MWh	$1.59
Approx. Noranda Annual Energy Cost	$ 140,325,170	Approx. Noranda Annual Energy Cost	$ 129,549,747
Noranda Contribution to Non-Noranda Revenue Requirement (at current rate, with Noranda receiving OSSM allocation)	$ 12,502,442	Noranda Contribution to Non-Noranda Revenue Requirement (at current rate, with Noranda receiving OSSM allocation)	$ 23,277,865
Net Residual Ratepayer Impact		**Net Residual Ratepayer Impact**	
Noranda Revenue at $30/MWh	$ 125,070,000	Noranda Revenue at $30/MWh	$ 125,070,000
Net Noranda Revenue at $30/MWh	$ (15,255,170)	Net Noranda Revenue at $30/MWh	$ (4,479,747)
Net Impact of Noranda OFF:	$ 12,502,442	Net Impact of Noranda OFF:	$ 23,277,865
Net Impact of Noranda ON, paying $30/MWh:	$ 27,757,612	Net Impact of Noranda ON, paying $30/MWh	$ 27,757,612
Customer Indifference Noranda Revenue Requirement:	$ 127,822,729	Customer Indifference Noranda Revenue Requirement	$ 106,271,883
Noranda Energy Rates @ Noranda Meter		**Noranda Energy Rates @ Noranda Meter**	
Minimum Energy-Only Rate:	$ 33.66	Minimum Energy-Only Rate	$ 31 07
Minimum Customer Indifference Noranda MWh Rate:	$ 30.66	Minimum Customer Indifference Noranda MWh Rate:	$ 25.49
Rate providing he Remaining Customer benefits assumed by Brubaker:	$ 33.61	Rate providing the Remaining Customer benefits assumed by Brubaker:	$ 28.44
Exis ing Noranda Rate on $/MWh basis:	$ 37 94	Existing Noranda Rate on $/MWh basis:	$ 37.94
% change to match Brubaker benefits:	-11%	% change to match Brubaker benefits:	-25%

Schedule SLK-5

Is Deemed

Highly Confidential

In Its Entirety