Exhibit No.:	
Issue(s):	Fuel Cost Uncertainty and Volatility; Lack of Control; Market Exposure
Witness:	Ajay K, Arora
Sponsoring Party:	Union Electric Company
Type of Exhibit:	Rebuttal Testimony
Case No.:	ER-2008-0318
Date Testimony Prepared:	October 13, 2008

MISSOURI PUBLIC SERVICE COMMISSION

Case No. ER-2008-0318

REBUTTAL TESTIMONY

OF

AJAY K. ARORA

ON

BEHALF OF

UNION ELECTRIC COMPANY
d/b/a AmerenUE

St. Louis, Missouri
October, 2008

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REBUTTAL TESTIMONY

OF

AJAY K. ARORA

CASE NO. ER-2008-0318

Q. Please state your name and business address.

A. Ajay K. Arora, Ameren Services Company (Ameren Services), One Ameren Plaza, 1901 Chouteau Avenue, St. Louis, Missouri 63103.

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

A. I am employed by Ameren Services as the Director of Corporate Planning.

Q. Are you the same Ajay K. Arora who filed Direct Testimony in this case?

A. Yes, I am.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to rebut the contention that Union Electric Company's d/b/a AmerenUE's (AmerenUE) hedging program and substantial reliance on coal-fired generation eliminates the need for a fuel adjustment clause (FAC), as contended by Staff witness Lena Mantle and others, and to rebut State of Missouri witness Martin Cohen's mistaken conclusion respecting the analysis reflected in my direct testimony. Specifically, I will demonstrate that

(1) coal costs for AmerenUE are significant and are subject to a significant amount of uncertainty even with AmerenUE's robust and well-defined coal hedging program;

(2) coal prices are volatile and comparable in uncertainty to natural gas prices;

(3) AmerenUE is exposed to fuel and power price volatility and uncertainty, and lacks the ability to control its net fuel costs, much like the exposure and lack of control observed for Aquila, Inc. (Aquila) and The Empire District Electric Company (EDE), both of which were given permission to utilize an FAC because of the fuel under-recoveries created by reliance on time-consuming, historical test year rate cases;

(4) Ms. Mantle's analysis fails to address AmerenUE's FAC proposal, and completely ignores the fact that off-system sales are included in AmerenUE's proposed FAC, that coal markets are quite volatile, and that AmerenUE's good choices respecting its resource mix and prudent hedging program should not somehow disqualify AmerenUE from implementing an FAC; and

(5) Mr. Cohen's conclusion about the observed historical uncertainty in coal as discussed in my direct testimony is wrong and reflects an apparent misunderstanding of my analysis.

A. <u>Significance of Uncertainty of Coal Costs</u>

Q. Are coal costs significant for AmerenUE?

A. Yes, AmerenUE's costs are unquestionably significant. As indicated in Mr. Neff's direct testimony, the budgeted cost of delivered coal for AmerenUE ranges from $604 million to more than $863 million annually for the years 2009 to 2012.

Q. Does AmerenUE have a hedging program in place to purchase coal?

A. Yes. As also addressed in Mr. Neff's direct testimony, AmerenUE has a robust and well-defined coal purchasing program that provides for closer

years to have more coal purchased than years further away. The goal of this risk managed approach is to mitigate the risk of volume shortages or large price spikes which AmerenUE accomplishes by purchasing some of its coal at least five years ahead of the actual need. This approach gradually hedges the coal needs over the five year time period but does not necessarily result in the lowest possible price for coal.

Q. You have indicated that AmerenUE's coal costs are significant and that AmerenUE has a robust and well-defined hedging program to purchase coal. Are AmerenUE coal costs significantly uncertain even with its hedging program?

A. Yes. This is demonstrated by Charts AKA-R1 and AKA-R2, below.

Chart AKA-R1

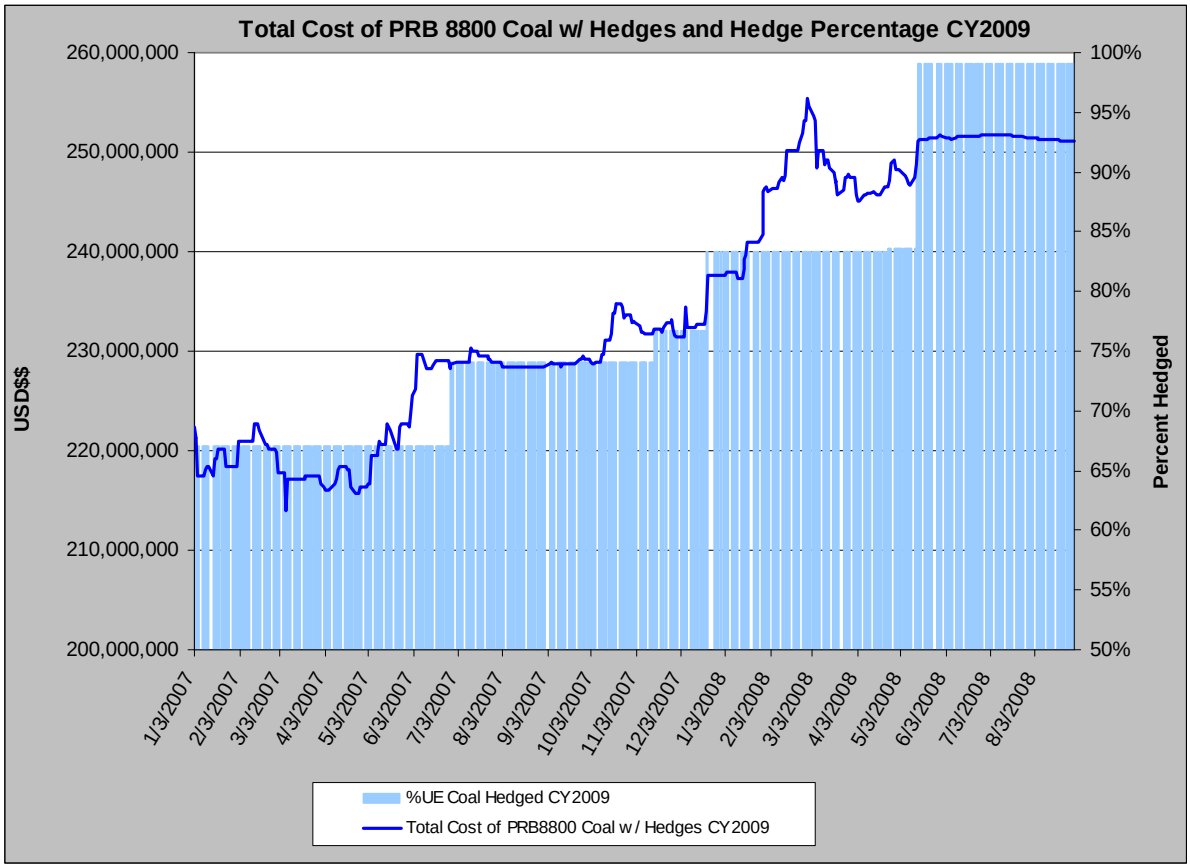

Total Cost of PRB 8800 Coal w/ Hedges and Hedge Percentage CY2009
USD$$
Percent Hedged
260,000,000
250,000,000
240,000,000
230,000,000
220,000,000
210,000,000
200,000,000
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
1/3/2007
2/3/2007
3/3/2007
4/3/2007
5/3/2007
6/3/2007
7/3/2007
8/3/2007
9/3/2007
10/3/2007
11/3/2007
12/3/2007
1/3/2008
2/3/2008
3/3/2008
4/3/2008
5/3/2008
6/3/2008
7/3/2008
8/3/2008
%UE Coal Hedged CY2009
Total Cost of PRB8800 Coal w/ Hedges CY2009

Chart AKA-R2

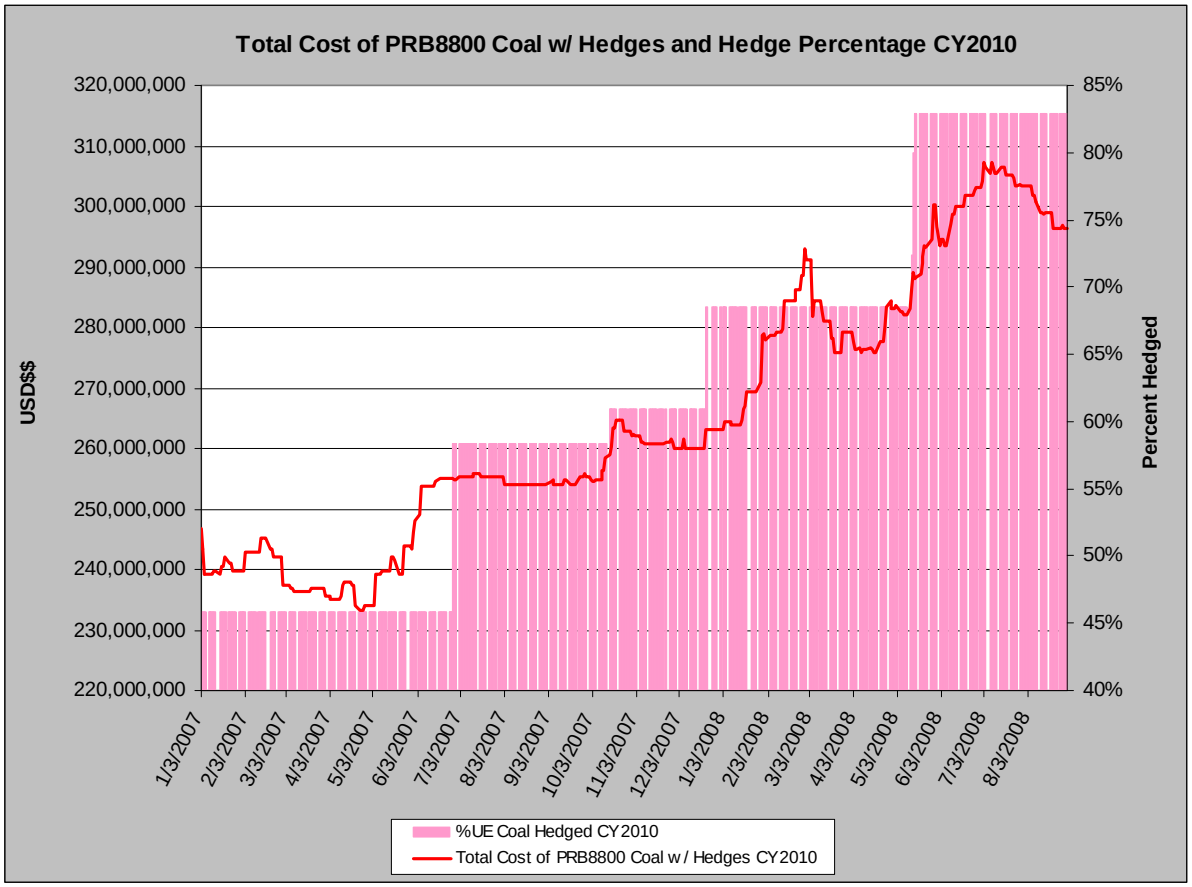


Chart AKA-R1 shows AmerenUE's expected cost for coal (the coal commodity itself – this does not include other significant costs associated with delivering the coal, such as rail transportation or diesel fuel surcharge) for 2009. Chart AKA-R2 shows the same information for 2010. For each date represented on the charts, if a certain amount of coal has been purchased (i.e., hedged) then the cost for that amount of coal is included at its purchase price. For the coal that still remains to be purchased (i.e., that is not yet hedged) the cost is included at the forward market price for coal. The expected cost on the left y-axis is the sum of the two costs – i.e., the hedged coal at its purchased price and the unhedged coal at the forward market price. The right y-axis

shows the amount of coal commodity hedged at any point of time depicted on the x-axis. All coal commodity requirements have been converted to PRB 8800 MMBtu coal equivalent to compare costs on an equivalent basis.[1]

As shown on Chart AKA-R1, as of January 2007, AmerenUE was approximately 67% hedged for its PRB coal commodity requirements for 2009, with the expected total dollar cost of AmerenUE's coal commodity needs for 2009 being $222 million. By January of 2008, AmerenUE had hedged about 83% of its PRB coal commodity needs for 2009, bringing the expected dollar cost of its coal needs to $238 million. Note that while more of its coal needs were hedged at this time, its exposure (in dollars) was actually greater because of underlying coal market price increases. By February 2008, the expected value of PRB coal commodity needs in 2009 had spiked to $254 million due to additional price increases in the coal commodity markets. By June 2008, AmerenUE had hedged virtually all of its PRB coal commodity needs for 2009, with an expected cost of $251 million**.**

Thus, simply focusing on the coal commodity alone, over the past 18 months, we have seen the expected PRB coal commodity cost for 2009 go from $222 million at the end of January 2007 up to a high of $254 million in February and then down to $251 million by June 2008, for a total cost change of $29 million. This substantial $29 million realized change in just the PRB coal commodity costs occurred even though AmerenUE fully executed its

[1] AmerenUE predominately burns PRB (Powder River Basin, Wyoming) 8800 MMB coal, but also burns some PRB 8400 MMB coal, which is slightly cheaper because of its lower heat content. I have therefore made a small adjustment to "convert" this PRB 8400 MMB coal to be price-equivalent to PRB 8800 MMB coal to

normal hedging program and was entirely due to the significant underlying uncertainty and volatility in the coal commodity markets. Note, however, that the range of potential outcomes that could have been experienced could have been more than these realized changes in PRB coal commodity costs.

Chart AKA-R2 demonstrates that similar variability in PRB coal commodity costs can be expected in future years, given the significant uncertainty in PRB coal commodity costs expected for 2010, with an already observed uncertainty range of almost $72 million, ranging from a low of about $234 million to $306 million. If I prepared a similar chart for PRB coal commodity costs for 2011 or beyond, similar variability would also be demonstrated.

Q. Does AmerenUE only burn PRB coal in its generating plants?

A. No. In addition to PRB coal, AmerenUE historically burns approximately 800,000 to 900,000 tons of Illinois coal annually.

Q. Have you seen similar price uncertainty in Illinois coal?

A. Yes. As demonstrated in Charts AKA-R3 and AKA-R4 below, the uncertainty in expected costs (shown by the variance between the high and low levels shown on the charts) for the Illinois coal commodity costs for AmerenUE have ranged from $17 million for the calendar year 2009 to about $36 million for 2010.

simplify the chart. Mr. Neff describes AmerenUE's use of PRB 8400 and 8800 MMB coal in his direct testimony.

Chart AKA-R3

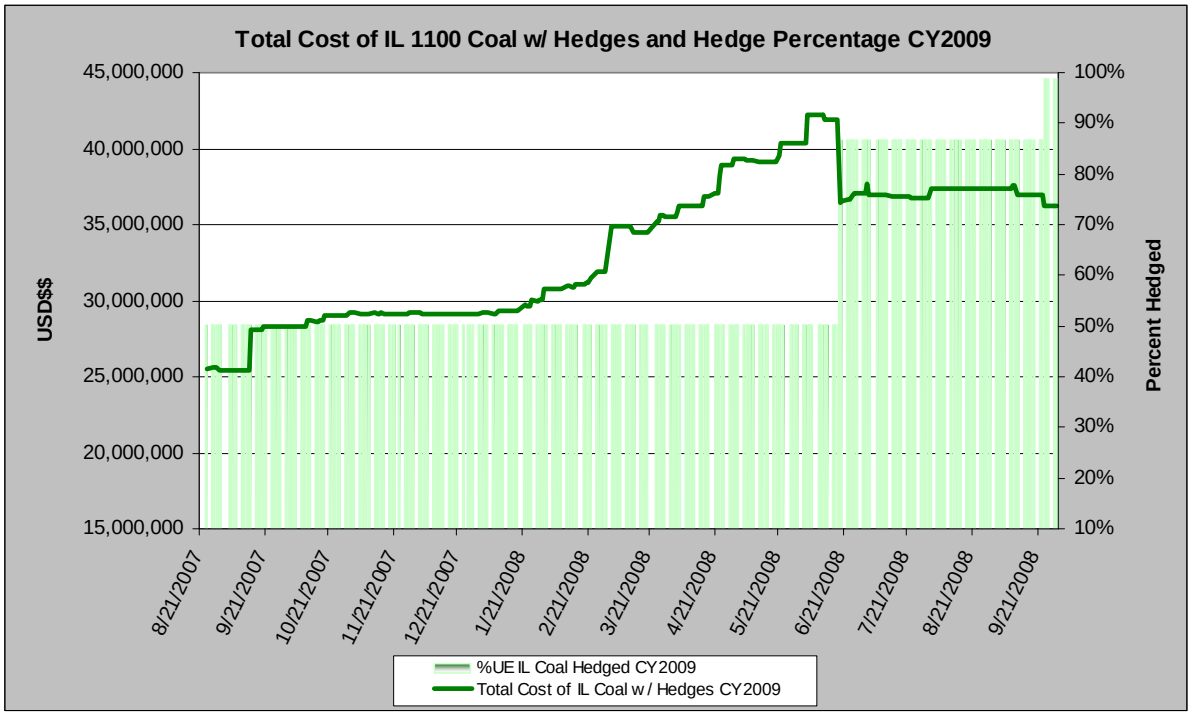
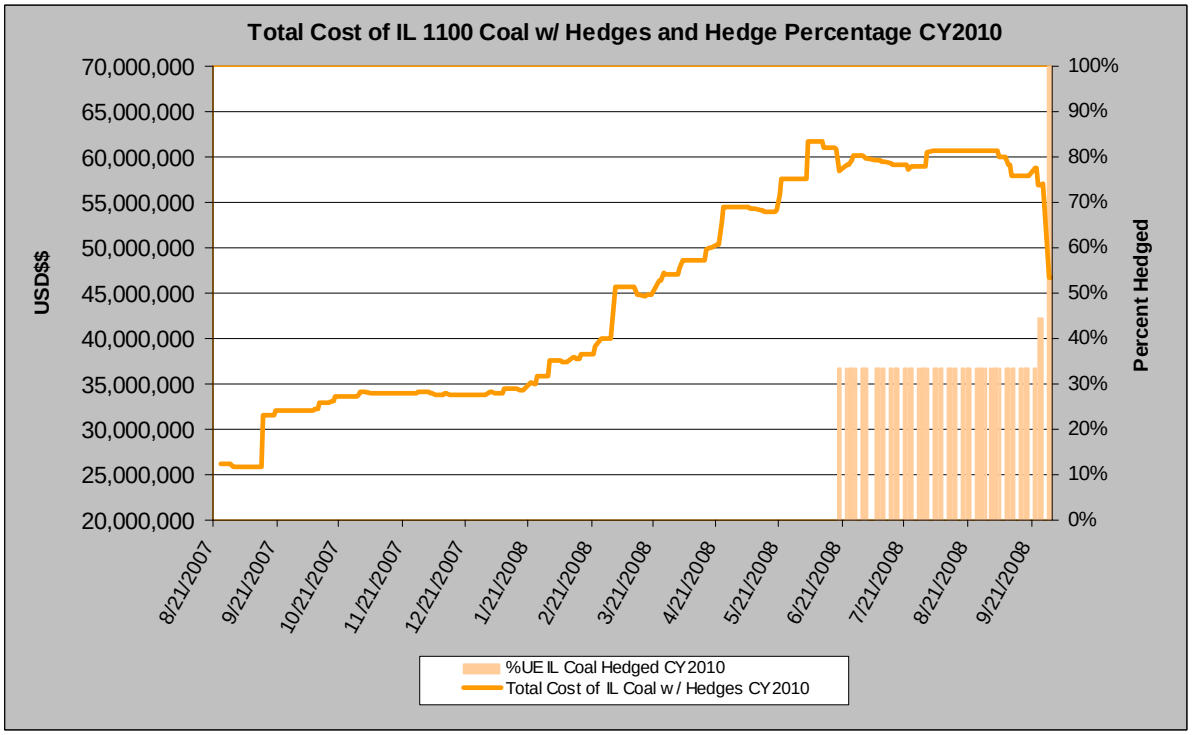


Chart AKA-R4



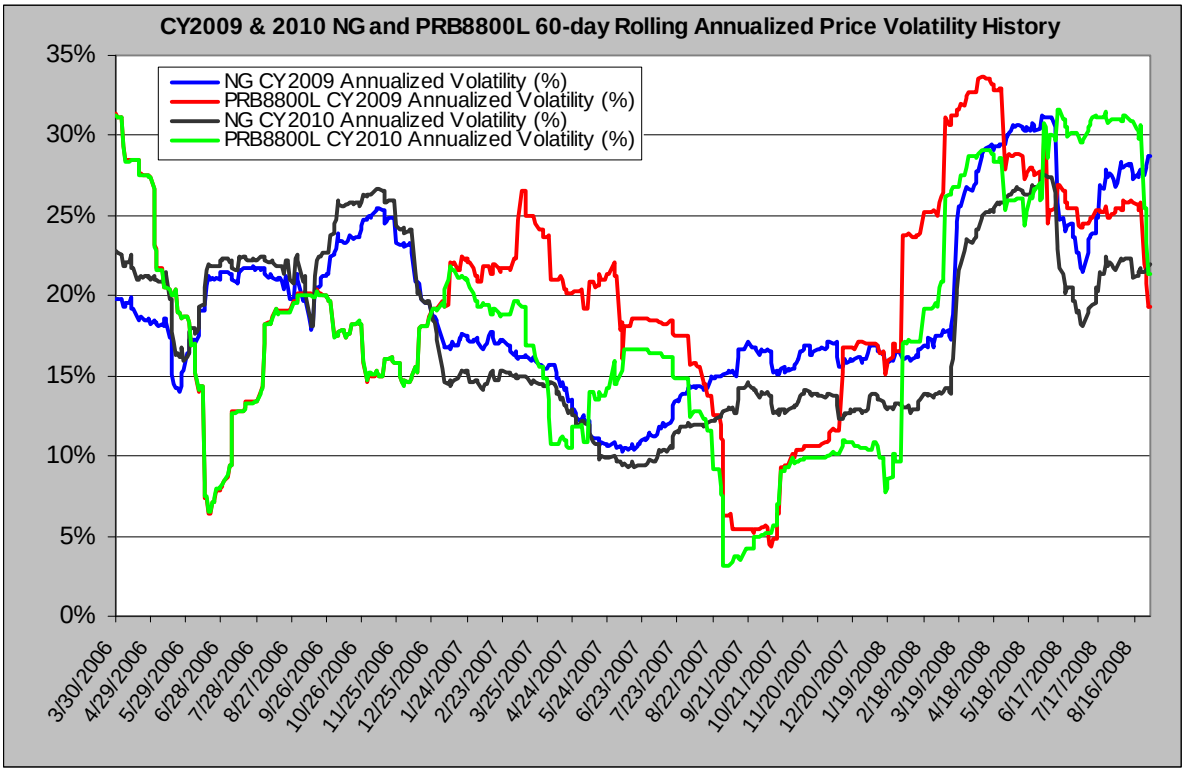
B. Volatility of Coal Costs

Q. The Staff's Cost of Service Report states on page 63 that "coal prices have not been volatile like natural gas and spot purchased power prices." Do you agree that coal prices have not been as volatile as natural gas prices?

A. No. Coal prices have shown volatility similar to natural gas prices. Please refer to the Chart AKA-R5 below. Chart AKA-R5 shows the rolling 60 business day (approximately 3 months) annualized volatility of natural gas and PRB 8800 coal commodity futures prices for calendar years 2009 and 2010. A 60-day average was used to smooth out the potential for extreme price swings due to daily prices.[2]

[2] The 60-day time period is used by the Ameren Risk Management Department because this time period ensures that the data is still relevant for future volatility estimation purposes, and is accurate for risk management purposes (i.e., it reduces the impact of correlation between days that are close together). The use of a rolling 60-day period for calculating annualized volatility is also consistent with most risk management practices for determining potential for price movements within a specified number of days or 'value at risk' for various commodities and also for pricing options.

Chart AKA-R5



As is clearly evident from the two coal lines (red and green) depicted on this chart, coal prices are extremely volatile and at times have in fact been even more volatile than natural gas (blue and black lines).

Q. Are the price changes for coal commodity and off-system sales prices within AmerenUE's control such that AmerenUE would have the ability to control its net fuel costs?

A. No, not at all. As demonstrated in my direct testimony there is significant volatility in AmerenUE's net fuel costs due to market conditions over which AmerenUE has no control.

C. Exposure to Markets

Q. Ms. Mantle asserts at page 61 of the Staff's August 28, 2008 Cost of Service Report that AmerenUE does not need an FAC because AmerenUE's share of natural gas and spot purchased power costs are less than 6% compared to more than 44% for Aquila and Empire as shown in Table LM1. Is Ms. Mantle's analysis and conclusion accurate?

A. No, it is not. Ms. Mantle's analysis as summarized in Table LM1 in the Staff Report is incomplete and is in fact misleading for the following three reasons. First, Ms. Mantle's analysis does not address the design of the FAC that AmerenUE has actually proposed in this case because it ignores the fact that AmerenUE's proposed FAC tracks changes in *net* fuel costs – i.e., gross fuel and purchase power expenditures *net* of off-system sales revenues. Ms. Mantle tries to calculate the proportion of total fuel costs that is accounted for by "volatile" natural gas and spot power purchases. Her analysis, however, fails to recognize that off-system sales are a significant component of the net fuel costs to which the FAC proposed by AmerenUE will be applied. This omission is surprising considering that page 39 of the Staff Report itself lists Staff's own $450 million estimate of off-system sales revenues. To ignore the fact that these $450 million are exposed to the same power price uncertainty as Aquila's and Empire purchased power costs invalidates Ms. Mantle's analysis and conclusions.

If off-system sales revenues are added to the analysis, the proportion of natural gas and spot power flowing through the FAC for AmerenUE is very similar to that of Aquila and Empire. This is shown in Table AKA-R1 below.

The table shows, based on FERC Form 1 data for calendar year 2007,[3] that AmerenUE's natural gas and net short-term power exposure (shown in Row 12) is 45 percent of the Company's total exposure associated with fuel and net power purchases or sales (shown in Row 14).[4] This is quite near the range of 48% measured for Aquila and 58% for Empire. A similar picture emerges if the three companies' fuel and net power exposure is compared to their total retail revenues. Here too, AmerenUE's fuel and net power exposure of 21%[5] is between the 20% to 24% range for Aquila and Empire. If Aquila's and Empire's exposure to the volatility of natural gas and short-term power markets justifies an FAC, AmerenUE's equally significant exposure to volatility in the very same markets justifies an FAC as well.

[3] Because Ms. Mantle has not been able to share the fuel and purchased power data from Aquila's and Empire's rate case, I am documenting these points with fuel and purchased power data from the companies' FERC Form 1. Please see notes within the table to identify the jurisdictions for the data.
[4] This is based upon AmerenUE's FERC Form 1 data. Using Staff's fuel run that underlies Staff's August 28, 2008 Cost of Service Report, the percentage is similar, 41%.
[5] Using Staff's fuel run, the percentage would be 20%.

Table AKA-R1

Comparison of Fuel and Power Market Exposure for Aquila, Empire, and AmerenUE
($ Millions, Based on 2007 FERC Form 1, Unless Noted)

		Aquila	Empire	AmerenUE	
				FERC Form 1	Staff Run with OSS
		[1]	[2]	[3]	[4]
Nuclear	[1]	$0	$0	$46	$47
Coal	[2]	$121	$32	$510	$562
Hydro	[3]	$0	$0	-$4	$0
Gas and Oil	[4]	$34	$81	$78	$36
Total Fuel Costs ([1] + [2] + [3] + [4])	[5]	***$155***	***$114***	***$630***	***$645***
Short-Term, Non-Firm, and Other Non-Requirements Purchases	[6]	$128	$26	$37	$52
Short-Term, Non-Firm, and Other Non-Requirements Sales	[7]	$44	$17	$427	$450
Net Short-Term Purchases or Sales (abs([6] - [7]))	[8]	***$84***	***$9***	***$391***	***$398***
Long-Term and Contract Purchases	[9]	$8	$32	$32	$24
Long-Term and Contract Sales	[10]	$0	$0	$0	$0
Net Long-Term Purchases or Sales (abs([9] - [10]))	[11]	***$8***	***$32***	***$32***	***$24***
Total Natural Gas and Net Short-Term Purchases or Sales ([4]+[8])	[12]	**$118**	**$91**	**$469**	**$434**
Total Fuel and Net Power Purchases or Sales ([5] + [8] + [11])	[13]	$247	$155	$1,053	$1,067
Natural Gas and Net Power Exposure *([12] / [13])*	[14]	***48%***	***58%***	***45%***	***41%***
2007 Total Retail Revenues	[15]	$580	$381	$2,222	$2,222
Natural Gas and Net Power Exposure *([12]/[15])*	[16]	***20%***	***24%***	***21%***	***20%***

Sources and Notes:
[1]: 2007 FERC Form 1 for Missouri jurisdictions only.
[2]: 2007 FERC Form 1 includes all jurisdictions (89% MO).
[3]: 2007 FERC Form 1.
[4]: Staff run with OSS derived from Rahrer workpapers, Commission Baseline Run (August 2008).

Sales and purchases reflect energy costs only.

Q. What is the second flaw in Ms. Mantle's analysis?

A. Ms. Mantle's analysis is also flawed because it implicitly assumes that coal is necessarily less volatile or can be hedged better than natural gas. As I have demonstrated above, however, the volatility of coal prices has been very similar to the volatility of natural gas prices. Regarding the ability to hedge that spot price volatility, as explained in Mr. Glaeser's rebuttal testimony, today's market hedging instruments for natural gas are available four to five years out, which is not dissimilar to the time frame that AmerenUE uses to hedge coal. In fact, as an example, AmerenUE's natural gas distribution operation significantly hedges its natural gas costs that are subject to the purchased gas adjustment (PGA) clause up to five years out in a market that is

more liquid than the coal markets. Thus, higher reliance on natural gas generation, particularly when gas generation is used similar to baseload generation (like Empire), does not automatically expose a company to higher volatility because instruments are available to hedge such baseload (or intermediate load) natural gas exposure. The same is true for power. A company like Aquila that spends nearly as much on power purchases as it spends on fuel purchases would be able to hedge its power exposure for several years through financial instruments or long-term (baseload or seasonal) contracts. Ms. Mantle's attempt to differentiate Empire and AmerenUE consequently is flawed in that respect. Just as AmerenUE hedges the coal requirements for its base load generation fleet, companies like Empire would be able to hedge the natural gas needs of their natural gas-fired baseload operations. In fact, hedging base- and intermediate-load gas and power costs should be easier as both power and natural gas markets are more liquid than coal markets.

Q. What is the third flaw in Ms. Mantle's analysis?

A. In evaluating Ms. Mantle's analysis and Table LM1, it becomes apparent that her rationale implicitly suggests that AmerenUE should not receive an FAC because the Company did a better job than Aquila and Empire in (1) developing a low-cost generation mix and (2) in hedging its base-load fuel costs. As Mr. Lyons' testimony discusses, it would be poor regulatory policy to penalize AmerenUE by denying an FAC based on the flawed perception that AmerenUE is not exposed to fuel cost volatility. As I showed in my

direct testimony on Table 1 on page 29, AmerenUE's fuel costs are extremely volatile. As shown in that Table 1 in my direct testimony, for the year 2010 there is a 50% chance that the uncertainty range of net fuel costs can exceed $156 million and a 20% probability that the uncertainty range can exceed $300 million. Table AKA-R1 above shows the percentage of AmerenUE's total net fuel and net power purchases or sales that are exposed to this volatility in power and gas prices is similar to that experienced by the other Missouri utilities that are operating under an FAC. Given these uncertainties it is not surprising, as Mr. Lyons shows in his testimonies, that virtually all other utilities in Midwestern and non-restructured states are able to operate under an FAC, including coal-intensive utilities like AmerenUE.

D. <u>Mr. Cohen's Misunderstanding</u>

Q. Have you read Mr. Martin R. Cohen's direct testimony regarding the Fuel Adjustment Clause (FAC).

A. Yes. I have.

Q. Does he address any of your direct testimony?

A. Yes, at page 19, lines 6 to 14 of his direct testimony, he attempts to address my calculation of an annual uncertainty factor for coal costs.

Q. Do you agree with Mr. Cohen's conclusion on page 19 lines 6 to 14 of his testimony?

A. No. Mr. Cohen's conclusion, that "coal costs showing a simulated annual uncertainty factor of 11% for 2012 versus an actual historical observed annual uncertainty factor of 31% for 1999-2007 indicates that AmerenUE has been

able to manage its fuel and purchased power costs reasonably well during a period of high uncertainty and without a Fuel Adjustment Clause," is simply wrong and reflects an apparent misunderstanding of my analysis. My analysis used forward market prices for coal, natural gas and power to illustrate the uncertainty of net fuel costs through 2012. I calculated historical annual uncertainties for each of those commodities to test whether the modeled results – which are all forward looking – made sense in view of historical observations. For coal, this historical comparison (which is not modeled, but is based upon a review of actual historical data) demonstrates that if anything, the modeled uncertainty in coal costs is understated. This doesn't have anything to do with how AmerenUE has managed fuel costs in the past. In fact, no matter how well AmerenUE has been able to manage its fuel costs, as Mr. Lyons points out in his rebuttal testimony, the time-consuming rate case process nevertheless has led to substantial under-recoveries of fuel costs due to the lack of an FAC. These under-recoveries will continue until AmerenUE is permitted to use an FAC.

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 Union Electric Company d/b/a AmerenUE for Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in the Company's Missouri Service Area.	)))))	Case No. ER-2008-0318

AFFIDAVIT OF AJAY K. ARORA

STATE OF MISSOURI)
) **ss**
CITY OF ST. LOUIS)

Ajay K. Arora, being first duly sworn on his oath, states:

1. My name is Ajay K. Arora. I am employed by Ameren Services Company as Director of Corporate Planning.

2. Attached hereto and made a part hereof for all purposes is my Rebuttal Testimony on behalf of Union Electric Company d/b/a AmerenUE consisting of 16 pages, all of which have been prepared in written form for introduction into evidence in the above-referenced docket.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct.

Ajay K. Arora

Subscribed and sworn to before me this 13th day of October, 2008.

Amanda Tesdall
Notary Public

My commission expires:

Amanda Tesdall - Notary Public
Notary Seal, State of
Missouri - St. Louis County
Commission #07158967
My Commission Expires 7/29/2011