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FILE

COMPANIES REMAND EXHIBIT NO. _____

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of Columbus Southern Power Company For Approval of its Electric Security Plan Including Related Accounting Authority; an Amendment to its Corporate Separation Plan; and the Sale or Transfer Certain Generating Assets	)	Case No. 08-917-EL-SSO
and	)	
In the Matter of the Application of Ohio Power Company for Approval of its Electric Security Plan Including Related Accounting Authority; and an Amendment to its Corporate Separation Plan	)	Case No. 08-918-EL-SSO

REBUTTAL TESTIMONY
ON REMAND OF
DR. CHANTALE LACASSE
ON BEHALF OF
COLUMBUS SOUTHERN POWER COMPANY AND
OHIO POWER COMPANY

Filed: July 25, 2011

INDEX TO DIRECT TESTIMONY OF
CHANTALE LACASSE

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PERSONAL DATA

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. A. My name is Chantale LaCasse. My business address is 1255 23rd St NW, Washington, DC, 20037.

Q. PLEASE INDICATE BY WHOM YOU ARE EMPLOYED AND IN WHAT CAPACITY.

A. I am a Senior Vice President with NERA Economic Consulting ("NERA").

Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY IN THIS CASE?

A. Yes. In my direct testimony in the remand phase of this proceeding, I explain the nature of the shopping-related risk faced by an SSO provider, whether an Electric Distribution Utility ("EDU") or a winning supplier at an SSO auction, and I provide support for the use of an option valuation model as an appropriate method to measure the cost associated with this shopping-related risk and borne by Columbus Southern Power Company ("CSP") and Ohio Power Company ("OPCo"), referred to collectively as "the Companies" or "AEP Ohio".

PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my rebuttal testimony is to respond to certain issues raised by the testimony of Industrial Energy Users – Ohio ("IEU") Witness Lesser in this remand proceeding. Specifically, I address the following:

- I respond to IEU Witness Lesser's criticism of the use of historical volatility and I explain that the use of such historical volatility as an input to the unconstrained and constrained models is reasonable;
- I show the flaw in IEU Witness Lesser's purported demonstration that the value to the customer of the option to switch is not necessarily equal to the costs to AEP Ohio;
- I respond to IEU Witness Lesser's assertion that a Black or Black-Scholes model cannot be used and his implication that a Monte Carlo method would yield a different result.

Q. ARE YOU SPONSORING ANY REBUTTAL EXHIBITS?

A. Yes. I am sponsoring Rebuttal Exhibits CL-1 to CL-3.

THE COMPANIES' USE OF HISTORICAL VOLATILITY IS REASONABLE

Q. IEU WITNESS LESSER CLAIMS THAT "WHAT WE WANT TO USE IN THE BLACK MODEL IS THE FUTURE VOLATILITY OF THE ASSET", P.21, LINES 7-8 IN LESSER DIRECT. DO YOU AGREE?

A. Yes, it is the case that the volatility input represents the future volatility of the asset.

Q. IEU WITNESS LESSER THEN CRITICIZES THE USE OF HISTORICAL VOLATILITY AND SUGGESTS THAT IMPLIED VOLATILITIES SHOULD HAVE BEEN USED INSTEAD. DO YOU AGREE WITH THIS CRITICISM?

A. I do not. Implied volatility developed from market data is a predictor of future volatility. As IEU Witness Lesser admits, historical volatility is "one predictor" of future volatility also, p. 21 lines 8-9 in Lesser Direct. This is the measure of future volatility that the AEP Ohio has used.

There is no single accepted method for calculating the volatility used as input to an option valuation model. My understanding is that practitioners use historical volatility, implied volatility, and sometimes develop their own proprietary methods to blend both historical and implied volatilities. Rajna Gibson's text *Option Valuation* discusses the issue at length on pages 114-120:

> "One method of computing the...future...variance (σ^2) is to simply rely on past data; that is, to assume that this past variability...is indeed invariant over time....An even more ambitious attempt toward "refreshing" the variance estimation is provided by the implied standard deviation (ISD) method that estimates...variability from the most recently available data, namely current market prices....The major difficulty, however, consists of interpreting the ISD derived from several options written of the same stock since these standard deviations will generally not be equal....Although the ISD method is broadly used among stock and currency option managers, however, there are a variety of "home made" variance estimations used by banks and financial institutions. They essentially result from the combination of a historically estimated standard deviation with an implicit standard deviation and with each institution's own forecast..."[1]

Q. IS IMPLIED VOLATILITY A MORE ACCURATE PREDICTOR OF FUTURE VOLATILITY THAN HISTORICAL VOLATILITY?

A. Not necessarily. Where liquid markets of options exist and a large volume of visible trades allows the estimation of implied volatility, I would tend to assume that the implied volatility is the best available estimate of volatility because it represents the current market view. But that is for the case where the relevant options are formed in a liquid

[1] *Gibson, Rajna. Option Valuation: Analyzing and Pricing Standardized Option Contracts, McGraw-Hill, New York, 1991.*

market. Volatilities calculated from bid and ask prices in thinner markets will yield different results. In thin option markets, prices may move in ways that reflect underlying market dynamics rather than volatility fundamentals, for example when large orders cause options prices to move. In markets such as these, even if implied volatilities could be calculated on the basis of some observed trades or bid and ask prices, historical volatility may be a more accurate predictor than implied volatility.

Q. DID AEP OHIO IN 2008 HAVE ACCESS TO MARKET DATA THAT WOULD PROVIDE A BASIS FOR CALCULATING IMPLIED VOLATILITIES USING TRADES OR QUOTES FROM A LIQUID MARKET?

A. No. I am informed by AEP that such data were not available.

IEU WITNESS LESSER'S ARGUMENT IN HIS DIRECT TESTIMONY AT PAGES 12-17 THAT THE VALUE OF THE OPTION TO CUSTOMERS IS NOT EQUAL TO AEP OHIO'S COST IS FLAWED

Q. IEU WITNESS LESSER ARGUES THAT THE BENEFIT OF THE POLR OPTION TO AEP OHIO CUSTOMERS IS NOT EQUAL TO THE COST TO AEP OHIO OF PROVIDING THAT OPTION. IS HIS REASONING CORRECT?

A. No, it is not.

Q. IS IT GENERALLY TRUE THAT THE BENEFIT TO ONE PARTY IN A TRANSACTION IS EQUAL TO THE COST TO THE OTHER PARTY?

A. No, it is not. Indeed, in the most transactions, both parties benefit. As IEU Witness Lesser points out in his desert analogy, both the thirsty man in the desert and the store reap benefits from their transaction, and the benefits enjoyed by the thirsty man are much,

much higher than the profits earned by the store. The principle at work here is that the thirsty man acquires a quantity of water, one bottle, and derives a benefit from consuming it that is measured by the difference between the value of that one bottle to the thirsty man and the price that he is asked to pay for it. Similarly, the store profits when its sells that one bottle of water for a price that exceeds its cost. However, this principle is not applicable to the quantification of the value of the option to shop for customers and the cost of AEP Ohio of providing that option.

Q. **WHY IS THIS SAME PRINCIPLE NOT APPLICABLE TO THE OPTION OF CUSTOMERS TO SHOP?**

A. It is not applicable because the customer's option is simply one of whether to shop. It is not an option of whether to buy electricity. The customer in the option valuation methodology used by AEP Ohio purchases a fixed quantity of electricity at a price no higher than the SSO price. Each customer is guaranteed the benefit that can be derived from purchasing that fixed quantity of electricity at the SSO price. The fact that the customer gets this benefit is a constant; it is true whether or not the customer exercises the option to shop.

What the option to shop provides the customer is the possibility of an *additional benefit* for the electricity purchased. If market prices fall sufficiently, the customer has an additional benefit, namely the benefit of purchasing the electricity from a CRES provider at a price below the SSO price. If, for example, the SSO price is $55/MWh and market prices fall so that CRES providers offer service at $45/MWh, the additional benefit to a customer who shops is $10/MWh. This additional benefit of $10/MWh is the value of the option per MWh in this instance.

Q. IS THE ADDITIONAL BENEFIT THE SAME FOR ALL CUSTOMERS OR IS IT JUST THE BENEFIT OF THE MARGINAL CUSTOMER AS IEU WITNESS LESSER CLAIMS?

A. The benefit is the same for all customers. Each customer who shops benefits by $10/MWh. Although each customer may have a different benefit from the quantity of electricity purchased at the SSO price because this benefit depends on how the particular customer values the electricity, every customer has the same benefit from shopping, which is the $10/MWh the customer can save.

Q. IS THE ADDITIONAL BENEFIT EQUAL TO THE COST TO AEP OHIO?

Yes. AEP Ohio, instead of selling to the SSO customer at $55/MWh, will make an alternate sale at the lower market price. The constrained model assumes that this alternate sale is made at the current market price of $45/MWh. The cost to AEP Ohio is then $10/MWh and equal to the benefit from the consumer. The methodology used by AEP Ohio quantifies this cost on an ex ante basis.

Q. HOW WOULD YOU CHANGE IEU WITNESS LESSER'S DESERT ANALOGY, FROM PAGE 14 LINES 3-18 OF HIS DIRECT TESTIMONY, SO THAT IT ILLUSTRATES THE VALUE OF THE OPTION TO SHOP FOR CUSTOMERS?

A. Every day you take a walk in the desert and you come out very thirsty. You have a deal with the grocery store that you pass by on your way home that it will sell you a large bottle of water for $1, regardless of what the price is that day. The bottle of water is worth $100 when you come back thirsty from your walk so that your benefit is $99. But you always check the price at the gas station besides the grocery store, just in case it sells that bottle of water for a lower price. One fine day, you look and the price from the gas

station is $0.90 and you buy it from the gas station instead of the grocery store. Your incremental benefit from shopping is $0.10 and this is the cost to the grocery store owner, who sells that bottle to the next person entering the store at the prevailing market price at that time. The value to the customer to shop and the cost to the store of shopping is $0.10. IEU Witness Lesser is incorrect to think that the value that AEP Ohio computes is $99.10 for the customer (the value from the actual water separate from the value of the option).

RESPONSE TO IEU WITNESS LESSER'S ASSERTION THAT A BLACK OR BLACK-SCHOLES MODEL CANNOT BE USED AND HIS IMPLICATION THAT A MONTE CARLO METHOD WOULD YIELD A DIFFERENT RESULT

Q. IEU WITNESS LESSER STATES THAT THE BLACK OR BLACK-SCHOLES MODELS "CANNOT" BE USED AND THAT A POSSIBLE IMPLICATION OF DOING SO IS AN OVERSTATEMENT OF THE POLR CHARGE. IEU WITNESS LESSER STATES THAT AN EMPIRICAL MONTE CARLO MODEL SHOULD BE USED INSTEAD P. 22 LINES 12-14 IN LESSER DIRECT IMPLYING THAT SUCH AN ANALYSIS WOULD YIELD DIFFERENT RESULTS. DO YOU AGREE WITH THIS CRITICISM?

A. I do not agree with IEU Witness Lesser that the option valuation methodology used by AEP Ohio is inappropriate. AEP Ohio's option valuation methodology is a reasonable method to quantify AEP Ohio's cost of shopping-related risk and a statement that it "cannot" be used is incorrect. In fact, an application of IEU Witness Lesser's preferred

Monte Carlo method only serves to support the reasonableness of the results obtained from AEP Ohio's option valuation methodology.

Q. HAVE YOU PERFORMED SUCH A MONTE CARLO ANALYSIS?

A. Yes. I have used a Monte Carlo model that quantifies the cost associated with shopping-related risk by stochastically modeling costs under different and changing market conditions.

Q. IEU WITNESS LESSER ALSO STATES THAT AEP OHIO HAS FAILED TO PROVIDE ANY ESTIMATES OF THE COST TO HEDGE RISK ASSOCIATED WITH ITS POLR OBLIGATION (LESSER DIRECT AT PAGE 34). DOES THE MONTE CARLO MODEL INCORPORATE SUCH AN ANALYSIS?

A. Yes, it does.

Q. DID YOU USE THE SAME INPUTS IN THE MONTE CARLO MODEL AS AEP OHIO DID IN ITS CONSTRAINED MODEL?

A. Yes. In particular, I used the same class loads, ESP prices, Market Rates, and volatility. I performed the calculation using the inputs from the constrained model, including the restrictions to shopping under AEP Ohio's tariffs. The inputs used are summarized in Rebuttal Exhibit CL-1.

Q. DOES THE MONTE CARLO MODEL SIMPLY RE-CREATE AEP OHIO'S OPTION MODEL OR IS IT A DIFFERENT APPROACH?

A. The model that I use is not an option valuation model. It takes a different approach so that it can serve as an independent basis to determine whether the results from the model used by AEP Ohio are reasonable.

Q. PLEASE DESCRIBE HOW YOUR MODEL WORKS COMPARED TO AEP OHIO'S CONSTRAINED MODEL.

A. Each iteration of the model simulates the retail market prices. Every month during the ESP period, the model predicts a forward curve for the remaining of the ESP period assuming that market prices follow a random walk. Customers leave SSO when the prevailing retail price falls below the ESP price. The model assumes that AEP Ohio sells power forward at prices below the ESP price when the model predicts migration in future months. The model calculates the cost to AEP Ohio as the difference between the ESP price and the prevailing retail price (when that price is lower).

If prices rise above the ESP price and customers return to SSO, the model assumes that AEP Ohio would purchase from the market at those higher market prices to serve SSO customers. The model also assumes that AEP Ohio will purchase power forward if the model predicts AEP Ohio would need to do so to serve SSO customers in future months. The model calculates the cost to AEP Ohio as the difference between the now higher retail price and the ESP price. Rebuttal Exhibit CL-2 illustrates the cost from shopping-related risk in a given month.

In each iteration of the model, the cost related to shopping-related risk is calculated on a per MWh basis. The model is run 20,000 times to allow for several different market price scenarios and the cost over all runs is averaged.

Q. DO THE RESULTS OF THE MONTE CARLO MODEL SUPPORT THE VIEW THAT THE MAGNITUDE OF THE COST RELATED TO SHOPPING-RELATED RISK CALCULATED BY THE CONSTRAINED MODEL IS REASONABLE?

A. Yes. The results are provided in Rebuttal Exhibit CL-3. Contrary to IEU Witness Lesser's proposition (page 32 of Lesser Direct) that the value of an option does not approximate the expected cost to AEP Ohio, the results from the Monte Carlo model support the magnitude of the cost associated with shopping-related risk calculated by the constrained model used by AEP Ohio.

Q. THE POLR COST RESULTING FROM THE MONTE CARLO MODEL ARE LOWER THAN THE COST OF SHOPPING-RELATED RISK CALCULATED BY THE CONSTRAINED MODEL USED BY AEP OHIO. ARE THERE DIFFERENCES BETWEEN THE MONTE CARLO MODEL AND THE CONSTRAINED MODEL THAT COULD ACCOUNT FOR THIS DIFFERENCE?

A. Yes, I can readily identify one such difference. The Monte Carlo model assumes that the customer makes decisions of whether or not to shop and take service from a CRES provider in a more myopic fashion than the customer in the constrained model. Under the constrained model, the customer decides whether or not to take service from a CRES provider by considering the entire path of future prices, the switching restrictions that apply, *and* by considering the possible future price movements that may occur. For example, a commercial customer under the constrained model may elect not to shop and not to take service from a CRES provider in a given month where there is an immediate (but temporary) saving from doing so. This could be expected if it is sufficiently likely, on the basis of future price movements, that there will be an even higher saving to the customer from staying on SSO and taking service from a CRES provider only at some future point in time. Under the Monte Carlo model, a customer decides whether or not to take service from a CRES provider by considering the entire path of future prices and the

switching restrictions that apply, but the customer does not explicitly take into consideration that prices will change again in the future. A customer in the Monte Carlo model who has an advantage to switch and take service from a CRES provider in the current month will do so on the basis of the anticipated prices at that point in time but without regards to how prices may change again in the future. In so doing, the customer may be foreclosing the possibility of switching at a later time for a greater savings, which would have imposed an ever greater cost on the Companies. Thus, the customer's decision making process will tend to understate the POLR cost compared to the calculation of those costs under constrained model used by AEP Ohio.

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

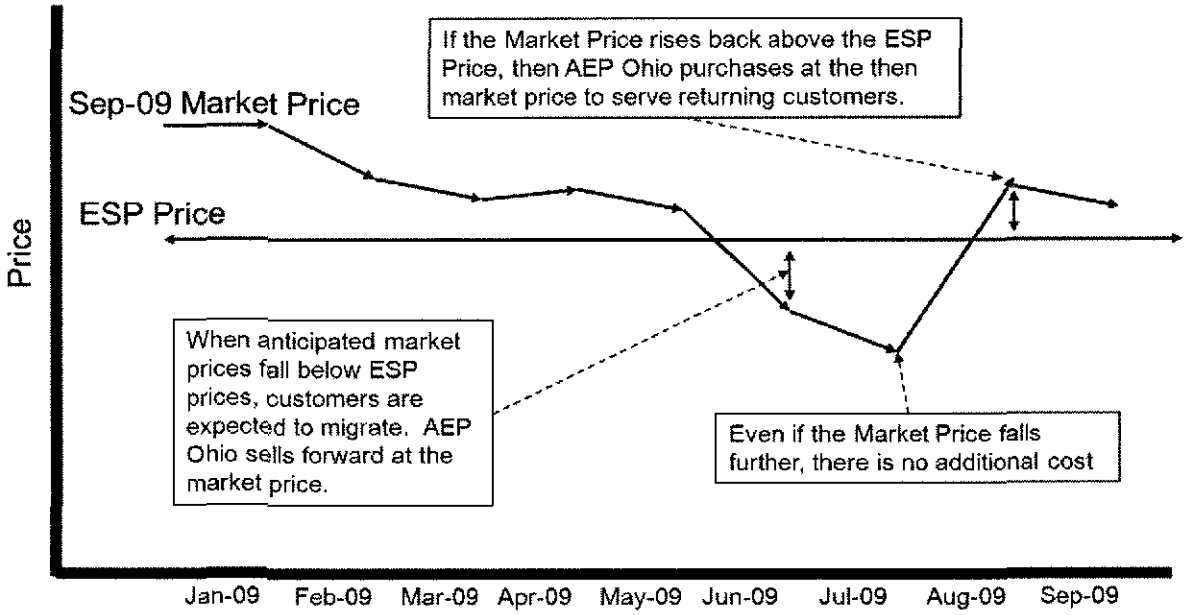
A. Yes, it does.

Model Inputs by Company

CSP Inputs				
Model Inputs	Residential	Commercial	Industrial	
2009 ESP Price ($/MWh)	50.00	55.86	40.61	
2010 ESP Price ($/MWh)	55.74	60.79	43.88	
2011 ESP Price ($/MWh)	62.08	66.12	47.38	
End of ESP Period	12/31/2011	12/31/2011	12/31/2011	
Market Rate ($/MWh)	82.93	73.72	65.51	(Staff reduced)
Volatility	33.3%	33.3%	33.3%	
MWh	7,755,121	8,913,106	5,718,983	

OPCo Inputs				
Model Inputs	Residential	Commercial	Industrial	
2009 ESP Price ($/MWh)	43.73	44.71	36.33	
2010 ESP Price ($/MWh)	49.62	49.84	39.76	
2011 ESP Price ($/MWh)	56.86	56.13	43.96	
End of ESP Period	12/31/2011	12/31/2011	12/31/2011	
Market Rate ($/MWh)	76.40	75.20	67.45	(Staff reduced)
Volatility	33.3%	33.3%	33.3%	
MWh	7,652,991	5,948,870	14,500,525	

Random Walk Example: Serving Customers in September 2009



Time Passing in ESP Period (2009-2011) (Random Walk)

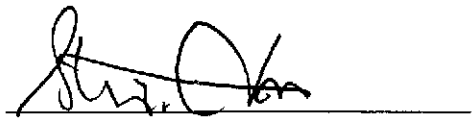
Model Results by Company

CSP Results				
Model Results	Residential	Commercial	Industrial	Weighted Average / Sum
MWh	7,755,121	8,913,106	5,718,983	22,387,210
Monte Carlo Cost ($/MWh)	2.70	4.75	1.74	3.27
Constrained Model Cost ($/MWh)	3.28	5.93	2.35	4.10
Difference	18%	20%	26%	20%

OPCo Results				
Model Results	Residential	Commercial	Industrial	Weighted Average / Sum
MWh	7,652,991	5,948,870	14,500,525	28,102,386
Monte Carlo Cost ($/MWh)	2.32	2.15	1.08	1.64
Constrained Model Cost ($/MWh)	2.78	2.85	1.53	2.15
Difference	17%	25%	29%	24%

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the foregoing Columbus Southern Power Company's and Ohio Power Company's Rebuttal Testimony of Dr. Chantale LaCasse has been served upon the below-named counsel via electronic mail, this 25th day of July 2011.



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