Exhibit No.:
Issue: Risk from Off-System Sales
Witness: Michael M. Schnitzer
Type of Exhibit: Direct Testimony
Sponsoring Party: Kansas City Power & Light Company
Case No.: ER-2012-0174
Date Testimony Prepared: February 27, 2012

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. ER-2012-0174

DIRECT TESTIMONY

OF

MICHAEL M. SCHNITZER

ON BEHALF OF

KANSAS CITY POWER & LIGHT COMPANY

Kansas City, Missouri
February 2012

"[redacted]**" Designates "Highly Confidential" Information Has Been Removed.**
Certain Schedules Attached To This Testimony Designated ("HC") Have Been Removed Pursuant To 4 CSR 240-2.135.

DIRECT TESTIMONY

OF

MICHAEL M. SCHNITZER

Case No. ER-2012-0174

Q: Please state your name and business address.

A: My name is Michael M. Schnitzer. My business address is 30 Monument Square, Concord, Massachusetts 01742.

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

A: I am a Director of the NorthBridge Group, Inc. ("NorthBridge"). NorthBridge is a consulting firm specializing in providing economic and strategic advice to the electric and natural gas industries.

Q: Please summarize your relevant professional background.

A: In 1992, I co-founded NorthBridge. Before that, I was a Managing Director of Putnam, Hayes & Bartlett, which I joined in 1979. I have focused throughout this time on assisting energy companies with strategic issues, particularly those relating to competition and wholesale market structure issues.

I have testified before the Federal Energy Regulatory Commission ("FERC") and a number of state commissions on issues relating to competitive restructuring and wholesale market design, including Locational Marginal Pricing and Financial Transmission Rights, Regional Transmission Organizations, standard market design, resource adequacy, and transmission expansion policies. On several occasions I have been invited by FERC staff to participate as a panelist in technical conferences on these subjects.

I hold a Master of Science degree in Management from the Sloan School of Management of the Massachusetts Institute of Technology, which I received in 1979. My concentration was in finance. I also received a Bachelor of Arts degree in chemistry, with honors, from Harvard College in 1975. A copy of my resume is attached as Schedule MMS-1.

Q: Have you previously testified in a proceeding before the Public Service Commission of the State of Missouri ("Commission")?

A: Yes. I have provided testimony in four prior rate cases on behalf of Kansas City Power & Light Company ("KCP&L" and "Company"), in each case in support of the Company's proposals for the treatment of off-system energy and capacity sales revenue and related costs as 'above the line' for ratemaking purposes. In 2006, I provided Direct, Rebuttal and Surrebuttal Testimony in Case No. ER-2006-0314 ("2006 Rate Case"). In 2007, I provided Direct, Surrebuttal and True-Up Direct Testimony in Case No. ER-2007-0291 ("2007 Rate Case"). In 2008/2009, I provided Direct, Rebuttal and Surrebuttal Testimony in Case No. ER-2009-0089 ("2009 Rate Case"). Most recently, in 2010/2011, I provided Direct and True-Up Direct Testimony in Case No. ER-2010-0355 ("2010 Rate Case").

I. PURPOSE OF TESTIMONY AND CONCLUSIONS

Q: Please describe the purpose of your testimony.

A: As I did in each of the four prior rate cases, I am providing a probabilistic analysis of the Company's level of net revenues (i.e., revenues less associated expenses) from off-system sales ("Off-System Contribution Margin" and "Margin") in this case ("2012 Rate

Case")[1]. My Direct Testimony in this 2012 Rate Case also supports the Company's proposed ratemaking treatment for off-system sales described in the Direct Testimony of Company witness Tim M. Rush. KCP&L proposes for the 2012 Rate Case to initially establish Off-System Contribution Margin at **[redacted]**, the 40th percentile of my probabilistic analysis for the period January 1, 2013 to December 31, 2013 ("2013 Period") and to account for this as a reduction to KCP&L's test year revenue requirements. As a departure from its past proposals, KCP&L offers a sharing mechanism with customers as set out in Mr. Rush's testimony.

My testimony is organized in five parts. In the first part, I summarize how the Commission has used my prospective probabilistic analysis of Margin in the four prior rate cases to determine an offset to revenue requirements and ultimately set rates for the Company. In the second part, I summarize the main points of my testimony concerning the risk and volatility of Off-System Contribution Margin as set out in my testimony in the four prior rate cases. In the third part, I discuss the underlying drivers of the probability distribution of Margin and changes in the relationship between the distribution of Margin and the distribution of energy prices. In the fourth part, I provide a prospective analysis of the probability distribution of Margin in the 2013 Period ("2013 Margin"). In the fifth part, I apply the results of the prospective analysis of 2013 Margin to the proposed KCP&L sharing mechanism and discuss the allocation of risk between KCP&L and its customers.

[1] My testimony in the 2006 Rate Case addressed the probability distribution of Off-System Contribution Margin for the 2007 calendar year. My testimony in the 2007 Rate Case addressed the 2008 calendar year. My testimony in the 2009 Rate Case addressed the period August 1, 2009 to July 31, 2010. My True-Up Direct Testimony in the 2010 Rate Case addressed the period May 1, 2011 to April 30, 2012 (originally the period April 1, 2011 to March 31, 2012). My Direct Testimony in the 2012 Rate Case addresses the probability distribution of Margin for the period January 1, 2013 to December 31, 2013.

Q: Could you please summarize your conclusions?

A: Yes, there are five. First, in the four prior rate cases I provided the Commission with an unbiased probabilistic analysis of Off-System Contribution Margin. In all of the decided rate cases[2], the Commission accepted the numerical results of my probabilistic distribution of Margin as an accurate estimate of Margin for the forecast period. The Commission also used my numerical results to establish an allocation of risk between KCP&L and its customers. Second, as in the prior rate cases, a forecast that takes into account all available forward market information provides the most accurate, unbiased prediction of 2013 Margin. A forecast made in January 2012 is likely to vary substantially from the level of 2013 Margin actually realized and the range of potential outcomes can be represented by a probability distribution that quantifies the variability in the outcomes. Third, the variability of 2013 Margin has increased relative to Margin in the 2010 Rate Case because Margin has become more sensitive to changes in energy prices. Thus, at comparable levels of forecasted energy price volatility, the range of the probability distribution of 2013 Margin has widened relative to that of the 2010 Rate Case. Fourth, forecast 2013 market prices of electricity in Southwest Power Pool-North ("SPP-N") from KCP&L's MIDAS™ model are very low, and are consistent with the very low price of natural gas forward strips. The MIDAS™ forecasts are reasonable based on the past correlation between observed market gas prices and electricity prices in SPP-N. A comprehensive prospective assessment of 2013 Margin indicates a broad range of possible outcomes centered on a median value of **[redacted]**, with a 40 percent likelihood of less than a **[redacted]** and a 40 percent likelihood of greater

[2] As described later in my testimony, the 2009 Rate Case was settled at a fixed total value for revenue requirements.

than a **[redacted]** contribution from 2013 Margin[3]. Fifth, KCP&L's proposal to initially establish the offset from off-system sales at the 40th percentile and then share differences between the offset amount and realized Margin, as described in Mr. Rush's testimony, fairly allocates the risk between the Company and ratepayers. The expected cost to the Company of guaranteeing 75 percent of the initial offset amount is balanced by the expected benefit to the Company of sharing 25 percent of the excess of realized Margin over the 60th percentile. The alignment of incentives to maximize the realized Margin is good public policy and should overcome the objections of incentive incompatibility raised by interveners in prior rate cases.

II. COMMISSION'S PRIOR DETERMINATION OF MARGIN

Q: Please elaborate on your first conclusion.

A: The Commission has used the numerical results of my prospective probabilistic analysis of Margin in prior rate cases to determine an offset to revenue requirements and ultimately to set rates for the Company. In choosing which point on my probability distribution to use, the Commission has weighed the incentives of the Company to make off-system sales and the risks to the Company of failing to meet Margin minimums.

Q: How was the level of Margin established in the 2006 Rate Case?

A: The 2006 Rate Case was the first conducted under the Regulatory Plan, as contained in a Stipulation among KCP&L and other signatory parties, and as approved by the Commission in Case No. EO-2005-0329. Importantly, at the time of the 2006 Rate Case, KCP&L derived almost 50% of its earnings from off-system sales. See Report and Order, p. 31 (December 21, 2006). The Stipulation contemplated the building of Iatan 2

[3] The 40th percentile value of my probability distribution is **[redacted]** and the 60th percentile value is **[redacted]**.

and proposed specific mechanisms for dealing with the financial burden and attendant financial risk on KCP&L during the construction. In the Stipulation, KCP&L agreed that off-system energy and capacity sales revenues would continue to be treated as 'above the line' for ratemaking purposes and that it would not propose any adjustment that would remove any portion of its off-system sales from its revenue requirement determination in any rate case filed under the Regulatory Plan approved in Case No. EO-2005-0329. The treatment of off-system sales margin was contested.

The Commission recognized that "Despite this language in the Stipulation, the parties have wildly differing views of what amount of off-system sales should be included in KCPL's revenue requirement." See Report and Order, p. 31. MPSC Staff ("Staff") had recommended that off-system sales be set at the historical test year level of 2005 sales. Praxair, Inc. had argued for KCP&L's 2006 budgeted amount. Office of the Public Counsel ("OPC") had proposed using my probabilistic analysis and setting the offset at the median (50^{th} percentile) value of the distribution. Finally, KCP&L had offered a proposal to mitigate the risk from experiencing a lower level of off-system sales than forecast. The Company proposed to set the revenue requirements offset at the 25^{th} percentile of my probability distribution and to book any excess of off-system margin realized as a regulatory liability to be flowed back to customers.

Q: What did the Commission decide in the 2006 Rate Case?

A: The Commission accepted the numerical results of my probabilistic distribution of Off-System Contribution Margin for calendar year 2007. See Report and Order, pp. 33-34:

> The Commission finds that the competent and substantial evidence supports KCPL's position, and finds this issue in favor of the alternative KCPL sponsored in which it would agree to book any amount over the 25^{th} percentile as a regulatory liability, and would flow that money back to

> ratepayers in the next rate case, with a corresponding regulatory asset account for KCPL to book any amount below the 25th percentile to be recovered in the next rate case... No parties disagreed with [Schnitzer's] analysis or offered counter-analysis.[58] The disagreement among the parties seems not to be with Mr. Schnitzer's analysis, but KCPL witness Giles' choice to pick the 25th percentile from among the probabilities.[59]

On consideration of motions for rehearing, the Commission eliminated the regulatory asset account, determining that it could provide a disincentive for KCP&L to make off-system sales up to the 25th percentile. See Order Regarding Motions for Rehearing, p. 3 (January 18, 2007). The result was that KCP&L effectively guaranteed the 25th percentile value from my analysis as a floor for off-system sales margin, and flowed back any excess of realized margin through the regulatory liability account. This asymmetric mechanism (i.e., a 'one-way reconciliation') was also used in each of the three subsequent rate cases.

Q: How was the level of Margin established in the 2007 Rate Case?

A: The 2007 Rate Case was filed at the beginning of 2007. By the time the true-up hearing was conducted in November of 2007, it was clear that the risk to KCP&L of establishing the floor for off-system sales margin was real. Actual off-system sales margins in 2007 were falling well below the 50th percentile of the final probability distribution of the 2006 Rate Case. Forced outages at Hawthorn 5 and Iatan 1 and market prices that averaged over $10/MWh less than in 2006 had significantly reduced off-system sales margin. "As of August of 2007, KCPL was not even halfway to last year's projected 25th percentile margin.[121] As the past year has shown, if nonfirm off system sales had been set at the 50th or even 40th percentile, KCPL would likely be below investment grade today.[122]" See Report and Order, p. 34 (December 6, 2007). The Commission was again faced with alternative proposals for establishing the level of the off-systems sales margin offset. The

Company, supported by Staff, proposed the same procedure for establishing the offset at the 25^{th} percentile as used in the 2006 Rate Case. OPC argued for using the 40^{th} percentile as the floor level that the Company would guarantee.

Q: What did the Commission decide in the 2007 Rate Case?

A: The Commission again accepted the numerical results of my probabilistic distribution of Off-System Contribution Margin for calendar year 2008, but faced a dispute among the parties over what was the appropriate point on my probability distribution to use in establishing the offset. "The disagreement that OPC has with KCPL and Staff seems not to be with Mr. Schnitzer's analysis, but KCPL witness Giles' choice to pick the 25^{th} percentile from among the probabilities.[135]" See Report and Order, p. 36. The Commission again balanced incentives and risk, and chose the 25^{th} percentile. See Report and Order, p. 39:

> In short, in balancing the interests of shareholders and ratepayers, straying from KCPL's recommended 25^{th} percentile might benefit ratepayers some, but might also damage KCPL much, much more than any benefit that might accrue to ratepayers...KCPL's rates should continue to be set at the 25th percentile of nonfirm off-system sales margin as projected in this case for 2008 as proposed by KCPL, and accepted by the Staff, and not at the 40th percentile as proposed by Public Counsel.

Q: How was the level of Margin established in the 2009 Rate Case?

A: The 2009 Rate Case was filed originally on September 5, 2008. The projection of the 25^{th} percentile of Margin filed in my Direct Testimony was **[redacted]** based on electricity market prices from the summer of 2008. The financial market collapse followed in October of 2008. By the time my Surrebuttal Testimony was filed on April 7, 2009, electricity market prices had collapsed along with prices in other markets, and the projection of the 25^{th} percentile of Margin had fallen to **[redacted]**. On April 24, 2009 KCP&L filed a Non-Unanimous Stipulation and Agreement with the

Commission that settled the 2009 Rate Case. The Stipulation provided for a fixed overall level of revenue requirements for KCP&L and fixed a value of $30 million as an off-system sales margin offset for purposes of tracking off-system sales and the regulatory liability account. See Order Approving Non-Unanimous Stipulation and Agreement and Authorizing Tariff Filings, Appendix A, p. 9 (June 10, 2009):

> KCP&L's OSS margins at the 25th percentile shall be set at $30 million, and shall be used for tracking purposes. Such tracker will reflect a pro-ration, on a monthly basis, of this amount for any partial years consistent with the percent of actual OSS realized in each month of 2008. All OSS margins will be tracked against the $30 million baseline.

Q: What did the Commission decide in the 2009 Rate Case?

A: The Commission approved this Stipulation in its Order Approving Non-Unanimous Stipulation and Agreement and Authorizing Tariff Filings.

Q: How was the level of Margin established in the 2010 Rate Case?

A: The 2010 Rate Case was filed on June 4, 2010 and was the first to include 472 MW of Iatan 2 in ratebase and in the KCP&L resources available for off-system sale. The Commission was yet again faced with alternative proposals for establishing the level of off-systems sales margin offset. The Company proposed the same procedure for establishing the offset at the 25th percentile that the Commission had approved in the 2006 and 2007 Rate Cases. Staff and Missouri Energy Users' Association ("MEUA") argued for using the 40th percentile[4] as the floor level that the Company would guarantee.

Q: What did the Commission decide in the 2010 Rate Case?

A: The Commission again accepted the numerical results of my probabilistic distribution of Off-System Contribution Margin, establishing the offset at the 40th percentile of the

[4] Staff argued that the 40th percentile value established in my True-Up Direct Testimony be used; MEUA argued for the 40th percentile established in my original Direct Testimony.

distribution from my original Direct Testimony. See Report and Order, p. 137 (April 12, 2011). In this case, the Commission again weighed the incentive for KCP&L to make off-system sales against the financial risk of not meeting the guaranteed floor. Based on its assessment of KCP&L's past performance in making off-system sales and the reduction in Company financial risk from the both the completion of Iatan 2 and the lower overall level of off-system sales margin (as a percentage of earnings), the Commission established a higher offset floor, set at the 40th percentile of my distribution.

Q: Please summarize your first conclusion.

A: In all of the decided rate cases[5] under the Regulatory Plan, the Commission has accepted the numerical results of my probabilistic distribution of Off-System Contribution Margin as an accurate estimate of Margin for the forecast period. Disputes over Margin among the parties in these decided rate cases have focused on the policy issues of risk allocation among the parties – considering the appropriate incentives for KCP&L to make off-system sales and the acceptable level of financial risk to KCP&L – and not on the validity of my analysis. In deciding the issue, the Commission has in each case allocated risk between KCP&L and its ratepayers by choosing a single point on my probability distribution of Margin, using that value as the minimum offset to revenue requirements, and establishing a regulatory liability to flow back to customers any realized Margin in excess of the offset.

[5] As described above, the 2009 Rate Case was settled at a fixed total value for revenue requirements, including a fixed value for the off-system sales margin offset.

III. SUMMARY OF RISK AND VOLATILITY TESTIMONY

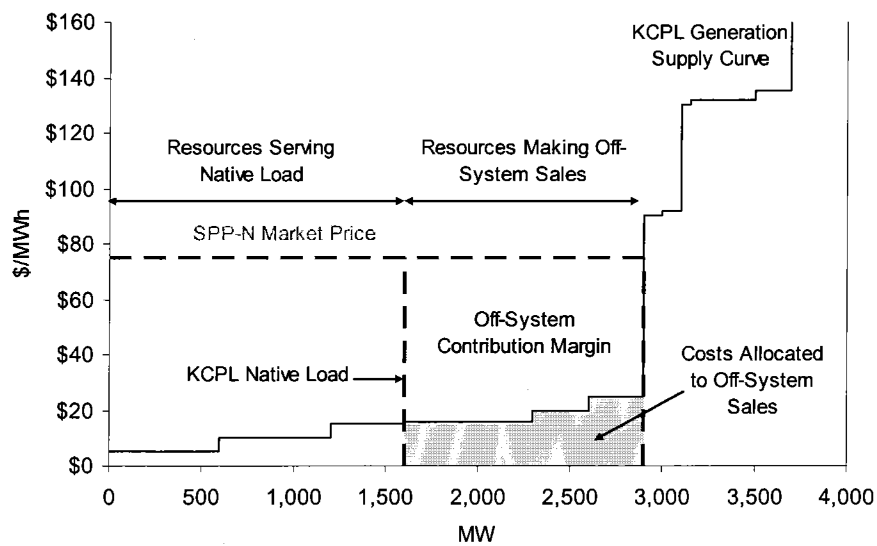
Q: Please elaborate on your second conclusion.

A: My Direct Testimony in the 2006 Rate Case discussed in detail the risk factors associated with making coal-based off-system sales. The key points from that testimony (which were restated in the 2007 Rate Case, the 2009 Rate Case, and the 2010 Rate Case) are set out below and are equally applicable to an analysis of 2013 Margin.

Q: What is Off-System Contribution Margin?

A: In any hour, Off-System Contribution Margin is the difference between gross revenues from off-system sales and incremental costs for those sales. The concept is illustrated in Figure 1 below.

Figure 1 – Illustrative Hourly Off-System Contribution Margin



As illustrated in Figure 1, KCP&L retail sales and firm wholesale sales ("Native Load") are first served by the least cost resources in the KCP&L generation supply curve. Costs are then allocated to non-firm off-system sales based on the incremental cost of operating the next units in KCP&L's generation supply curve to make the additional off-system sales, which incremental costs are based largely on the price of coal. Revenues are simply the market price realized times the quantity available for sale. As illustrated in Figure 1, KCP&L makes off-system sales at a regional SPP-N market price. The price for non-firm sales in any particular hour is simply the intersection of the regional supply and demand curves in that hour.

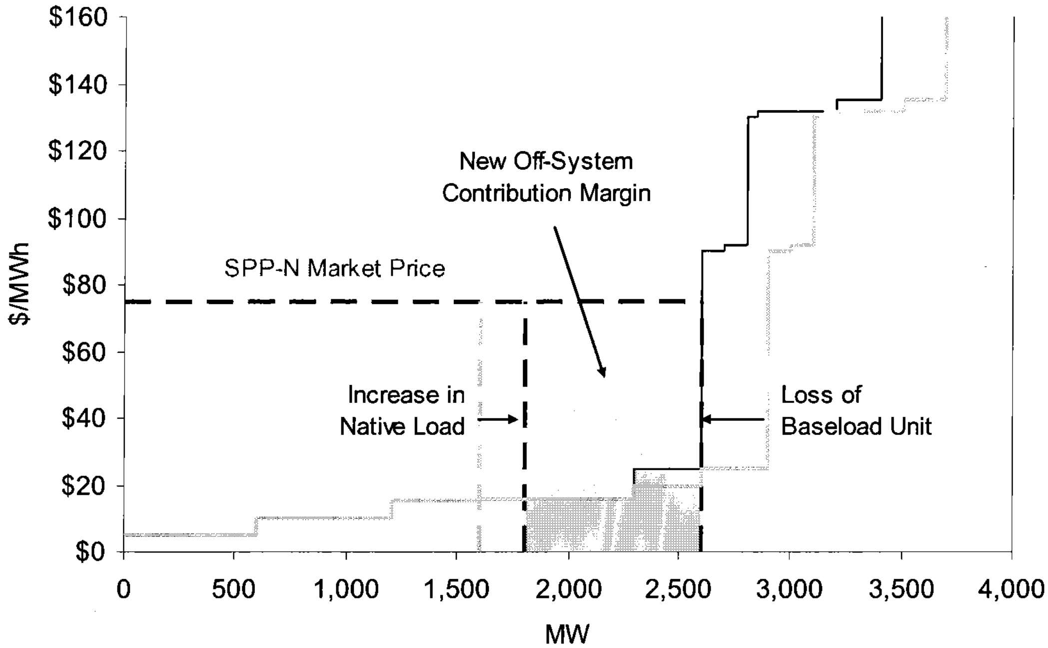
Q: What causes variability in Off-System Contribution Margin?

A: Although there is some potential for variability in the cost of making non-firm sales, the primary source of variability is from revenue variability. So, Margin variability results primarily from variability in quantity and price, as total off-system revenue in any hour is equal to the product of the quantity available for sale in that hour and the market price. The variability of Margin is further magnified by the 'leveraging effect' of making coal-based sales into a gas-dominated market, as described below.

Q: What causes variability in the off-system sales quantity?

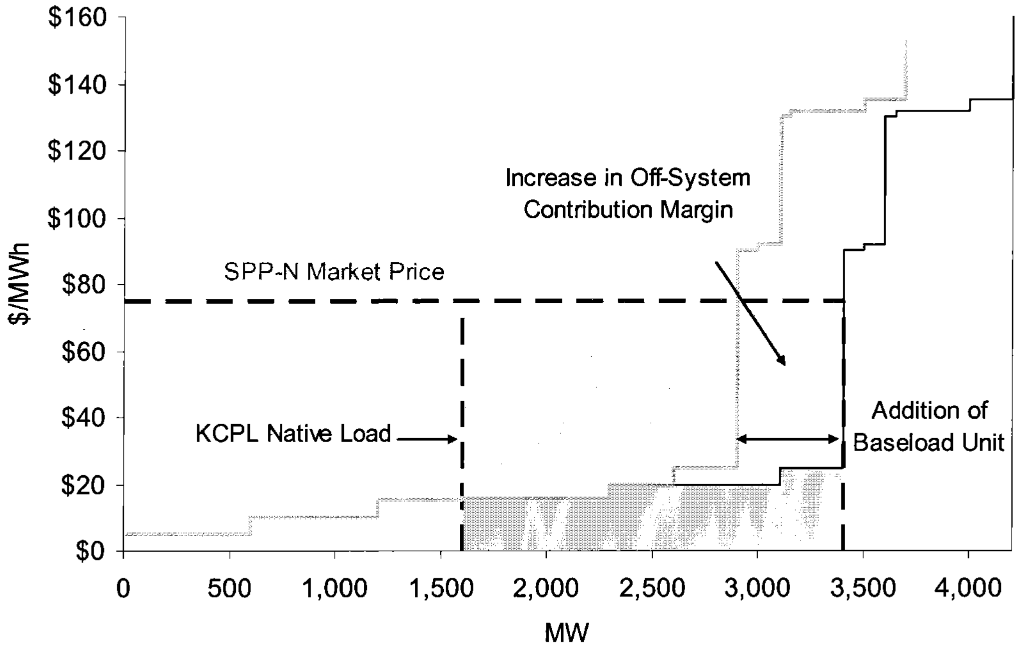
A: The volume of off-system sales is driven by KCP&L's dispatch cost versus the SPP-N market price, and KCP&L's quantity of MWs available for sale. The two biggest factors in the quantity of MWs available for sale are unit availability and KCP&L's Native Load obligations. A unit outage and/or an increase in Native Load can reduce the size of the Margin as shown below in Figure 2. Conversely, an increase in the capacity available for sale (e.g., the addition of Iatan 2) can increase the size of the Margin as shown further below in Figure 3.

Figure 2 – Impact of Loss of Baseload Unit and Increase in Native Load



For example, if a large baseload unit becomes unavailable because of planned maintenance or a forced outage, the supply curve will shift to the left, decreasing the area under the horizontal SPP-N market price line and to the right of the vertical KCP&L Native Load line. In this case, other higher-priced KCP&L units will be available, but will not be economic to dispatch at that particular market price. Similarly, if the Native Load increases, then all other things equal, there will be a smaller amount of economic output available for off-system sale at market prices. As illustrated in Figure 3 below, the addition of new coal-fired capacity – such as Iatan 2 – will, all other things equal, increase KCP&L's available economic output and consequently increase Margin.

Figure 3 – Impact of Addition of Baseload Unit (e.g., Iatan 2)



Q: What causes variability in the off-system sales price?

A: Historically, observed day-ahead spot prices in SPP-N have been highly correlated with the price of natural gas. The strong correlation between gas and electricity prices has allowed for a convenient representation of this relationship, as originally described in my Direct Testimony from the 2006 Rate Case[6]:

> Because of the strong correlation with natural gas prices, the market price can be conveniently represented as two separate components: the price of natural gas and the "market heat rate." The market heat rate is not the same as a physical heat rate. For example, an efficient baseload coal unit may have a physical heat rate of 9,500 Btu/kwh, while a gas peaking unit may have a physical heat rate of 12,000 Btu/kwh. Instead, a market heat rate represents the market price of electricity in any hour denominated in $/mwh divided by the current delivered price of natural gas denominated in $/mmBtu. Dividing through and adjusting for units produces a quotient which is a market heat rate denominated in Btu/kwh. Price volatility can

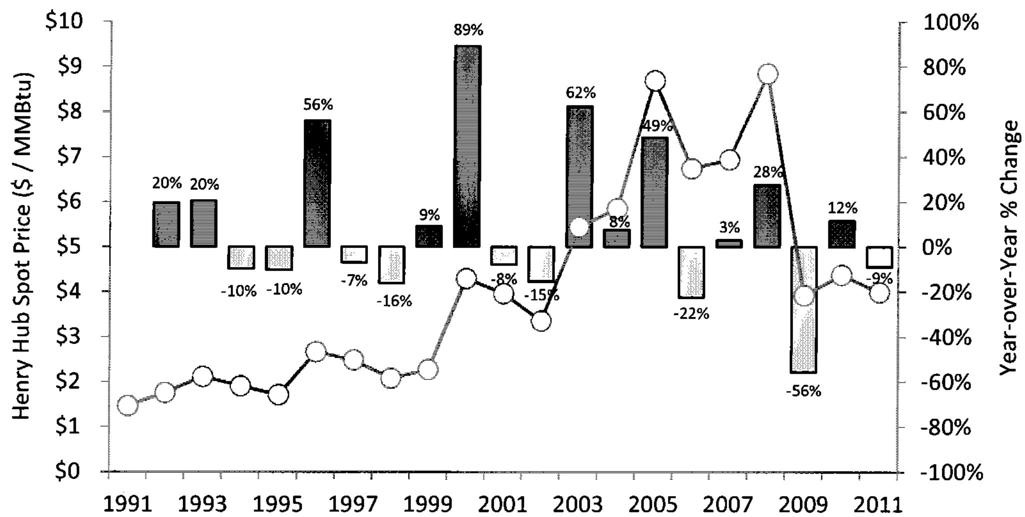
[6] Direct Testimony of Michael M. Schnitzer, p. 8 (Case No. ER-2006-0314, filed January 27, 2006).

be described as a function of these two factors: gas price and market heat rate.

Q: How volatile has the price of natural gas been in the past two decades?

A: Since 1991 annual average Henry Hub spot gas prices have had an annualized volatility of 32 percent[7], peaking in 2005 and 2008, and dropping significantly from the 2005 peak in 2006 and dramatically from the 2008 peak in 2009, as shown in Figure 4 below. From the 2009 low, prices moved up 11% in 2010 and down 9% in 2011.

Figure 4 – Annual Gas Prices and Volatility 1991 to 2011



Q: Do the relatively small movements in annual average natural gas prices in 2010 and 2011 mean that natural gas prices are now less volatile than in the past?

A: No. Although the price movements in 2010 and 2011 were small compared to the more dramatic movements in 2008 and 2009, this does not mean that natural gas prices are now stable. Figure 4 clearly shows instances of periods where spot prices varied little for two or three years, only to be followed by a dramatic price movement in the following year.

---

[7] Volatility is expressed as the standard deviation of year-over-year percentage price changes using natural logarithms.

Q: How does volatility in gas prices affect volatility in electricity prices?

A: The "market heat rate" linkage noted above is detailed in my 2010 Direct Testimony[8]:

> The second factor, the "market heat rate," is simply the ratio relating gas prices to electricity prices, but is itself an uncertain variable. Even if there is no gas price volatility, changes in the supply/demand balance will result in different units being on the margin in different time periods. Consequently, electricity prices will fluctuate as the market heat rate changes. This uncertainty is driven by several underlying factors: coal and emission allowance prices, weather (relatively extreme temperatures elevate demand), fluctuations in economic activity and demographics, unit availability (particularly extended outages), and construction/retirement of generating units throughout SPP.

Q: What is the leveraging effect of making coal-based off-system sales in a gas-dominated market?

A: The leveraging effect was originally described in my Direct Testimony from the 2006 Rate Case[9]:

> Simply put, the leveraging effect means that for a 1% change in gas price, there will be a greater than 1% change in Off-System Contribution Margin. Suppose, for example, the incremental cost of generating power for off-systems sales from a coal unit in a particular hour is $30/mwh (or $0.03/kwh). Also suppose that gas is on the margin in SPP-North in that hour, resulting in a market heat rate of 10,000 btu/kwh, and that the price of gas is $6.00/mmBtu (or $0.00006/btu). Then, the spot market price is by definition 10,000 btu/kwh multiplied by $0.00006/btu, and equal to $.06/kwh or $60/mwh. The margin earned by the coal unit in that hour is $30/mwh (revenues of $60 less cost of $30). If the price of gas increases by 27%, the impact on the margin is leveraged. The new price of gas is $7.62/mmBtu and the spot market price increases proportionately (assuming the market heat rate remains constant because gas is on the margin) and now equals $.0762/kwh or $76.20/mwh (calculated as 10,000 btu/kwh multiplied by $0.0000762/btu). However, the margin for that hour is now $46.20/mwh (revenues of $76.20 less cost of $30), an increase of 54%, which is in fact double the increase in the gas price. The size of the leverage in any hour where gas is on the margin varies depending on the size of the original margin compared to the incremental cost. In the simple example described above, the margin of $30/mwh was equal to the incremental cost, resulting in a doubling of the impact of the gas price

[8] Direct Testimony of Michael M. Schnitzer, pp. 7-8 (Case No. ER-2010-0355, filed June 4, 2010).
[9] Direct Testimony of Michael M. Schnitzer, p. 11 (Case No. ER-2006-0314, filed January 27, 2006).

> increase. If the original incremental cost had been $45/mwh, and the margin only $15/mwh, the impact of this leverage would have been an increase of 108% (i.e., to quadruple the price effect of the natural gas increase).

Q: Do past realized Off-System Contribution Margins provide a good prediction for the future?

A: In general, no. The Company's future Off-System Contribution Margins will depend on future electricity and gas prices, loads, fuel prices, and unit availability. The best current predictor of future commodity prices and the associated future Margins is visible forward market prices. That is not to say that actual results will not turn out to be different than the forecast – they likely will – but a forecast based on forward price data is the best that can be done.

Q: Please summarize your second conclusion.

A: Off-System Contribution Margin is subject to variability caused by the underlying variability in the economic opportunities for KCP&L's units to make off-system sales at market prices that exceed their variable costs, and the availability of those units to make sales. As in the prior rate cases, a forecast that takes into account all available forward market information provides the most accurate, unbiased prediction of 2013 Margin. A forecast made in January 2012 is likely to vary substantially from the level of 2013 Margin actually realized and the range of potential outcomes can be represented by a probability distribution that quantifies the variability in the outcomes.

IV. VOLATILITY IN OFF-SYSTEM CONTRIBUTION MARGIN DRIVERS

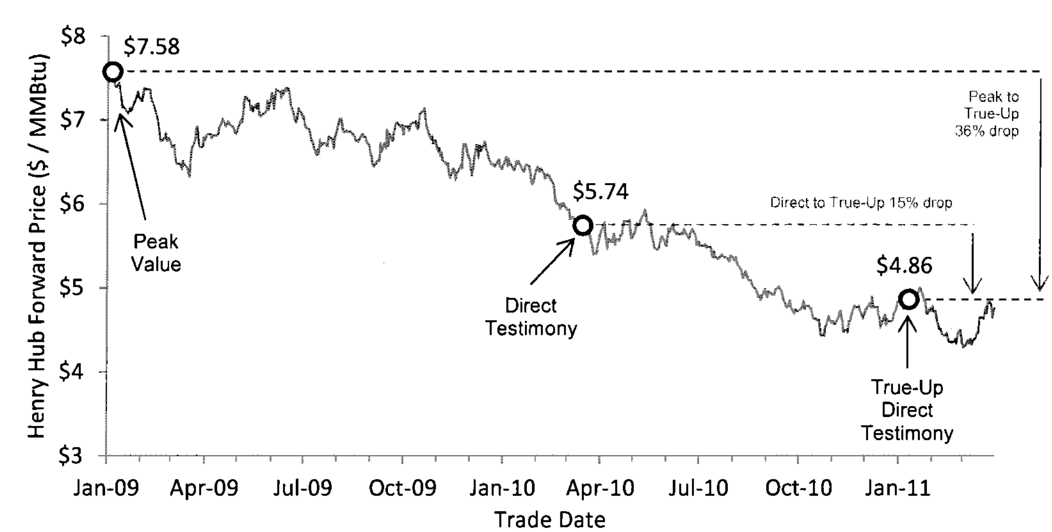
Q: Please elaborate on your third conclusion.

A: Margin variability has increased, given the same level of volatility in the underlying drivers of Margin. I expect the high volatility in the forward price of energy seen in the 2010 Rate Case delivery period to continue in the 2013 Period.

Q: How volatile were natural gas prices during the 2010 Rate Case?

A: The 2010 Rate Case forecast the twelve months ending April 30, 2012. An annual forward strip for this rate period (the "2011-12 Period Strip") can be calculated from monthly forward contracts. As shown in Figure 5 below, the 2011-12 Period Strip reached its highest point on January 5, 2009, when it traded at a price of $7.58/mmBtu. The 2011-12 Period Strip was lower on March 16, 2010 (the market date corresponding to my 2010 Direct Testimony) at $5.74/mmBtu and declined further to close at $4.86/mmBtu on January 11, 2011, the market date corresponding to my 2010 True-Up Direct Testimony, down 36% from the peak and 15% from March 16, 2010.

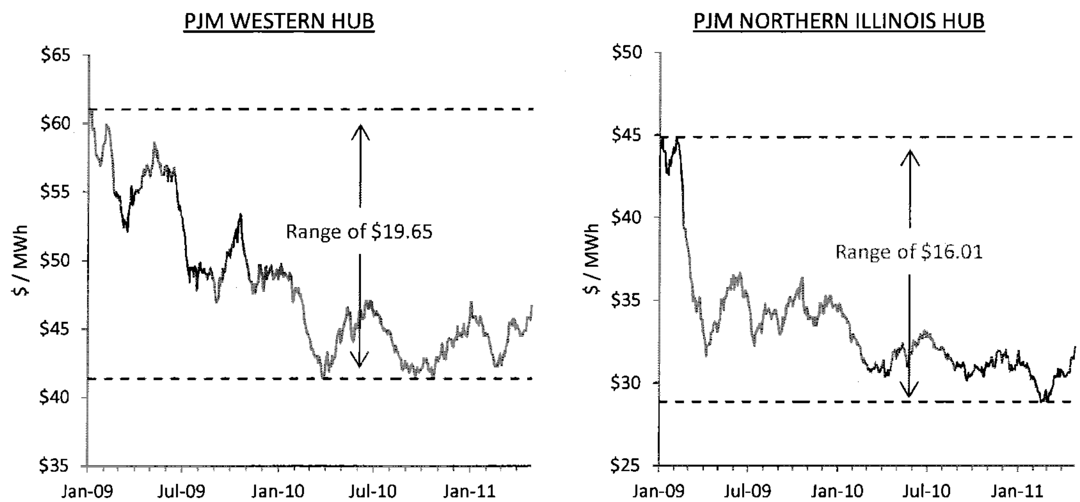
Figure 5 – Henry Hub 2011-12 Period Strip



Q: What were the observed price movements in the forward markets for electricity over the same period of time?

A: The forward market in SPP-N is currently a bilateral market in which equivalent forward strip prices are not directly observable. However, similar price volatility in 2010 and 2011 can be directly observed at other regional trading hubs, such as the Northern Illinois Hub ("NI-Hub") and the PJM Western Hub ("PJMW-Hub")[10]. Figure 6 below shows the volatility in the 2011-2012 Period Strip between 2008 and 2011 for both markets.

Figure 6 – PJMW-Hub and NI-Hub 2011-12 Period Strip 7x24 Contracts



Q: What does this tell us about the prices for electricity in SPP-N during this period of time?

A: Although not directly observable, the forward market for electricity in SPP-N in 2010 and 2011 was likely characterized by the same kind of price declines and volatility evident in

[10] The NI-Hub and the PJMW-Hub each offer buyers and sellers a trading point for a location-price-based energy market and a common price index that provides certainty about the price reference point. The hubs consist of pricing points from a large number of generation and load busses in particular geographic areas of PJM.

observable market data during the same period in both gas markets and other regional power markets.

Q: Has the relationship between the variability of Margin and the volatility of its underlying drivers changed since 2010?

A: Yes. The variability of Margin is considerably higher than in prior cases even as the volatilities of the underlying drivers (*e.g.*, natural gas prices) are similar to the level of uncertainty forecast in prior cases. The reason is that as electricity prices decline, the expected margin at KCP&L's baseload units also declines. When the expected margin is relatively small, variations in realized energy prices translate to larger percentage changes in margin. Figure 7 (HC) below shows the around–the-clock ("ATC") (7x24) Energy Price forecast in the 2010 Rate Case as of the true-up date compared to the current forecast in 2013. It also compares the fuel cost of a KCP&L coal unit and the hypothetical profit margin of selling the output at the ATC price. Because the profit margins on the KCP&L coal units have been squeezed, their level of off-system margin is subject to much greater leverage as described in Section III of my testimony. The result is that margin volatility is greater under a lower energy price forecast than it would be under a higher energy price forecast.

**[redacted]

[redacted]**

Q: What is the effect on the probability distributions of gas/electricity prices compared to the effect on the distribution of Margin?

A: As in past rate cases, gas and electricity prices continue to be distributed in a 'log normal' form similar in shape to the common 'Bell Curve', but with a somewhat accentuated right tail. Figure 8 (HC) below shows the probability distribution of delivered natural gas prices for calendar year 2013 with a median (50^{th} percentile) value of **[redacted]**.

**[redacted]

[redacted]**

HIGHLY CONFIDENTIAL

Q: Is the ATC electricity price in SPP-N similarly distributed?

A: Yes. Figure 9 (HC) below shows the probability distribution of ATC (7x24) electricity prices for calendar year 2013. The median value for ATC electricity is **[redacted]** and the shape of the distribution tracks closely with that of delivered gas shown in Figure 8 (HC).

[redacted]

Q: How does the distribution of Off-System Sales Margin differ?

A: Figure 10 (HC) below shows the probability distribution of Margin for calendar 2013. The distribution rises steeply from zero and then has an elongated tail to the right. The **[redacted]** median value of Margin is located further to the left side of the probability distribution, as compared with the medians of the distributions in Figures 8 (HC) and 9 (HC). The shape of this distribution is significantly different than either natural gas or SPP-N ATC price due to the 'leveraging effect' described in Section III and illustrated in Figure 7 (HC). The difference in shape occurs because small variations in ATC energy price translate into much larger percentage changes in margin. However, since Margin cannot be negative, the increased variability in Margin tends to flatten the distribution and stretch it to the right, giving it a very different appearance than either the natural gas or SPP-N ATC price distributions.

[redacted]

Q: Please summarize your third conclusion.

A: Variability of 2013 Margin has increased relative to Margin in the 2010 Rate Case. Forward energy prices, the underlying drivers of Margin, are expected to continue to be volatile, as they were in the 2010 Rate Case. But, the relationship between the distribution of Margin and the distribution of energy prices has changed, resulting in increased sensitivity of Margin to changes in energy prices, and higher variability of Margin.

V. PROBABILITY DISTRIBUTION OF 2013 MARGIN

Q: Please elaborate on your fourth conclusion.

A: I prepared an estimate of the probability distribution of 2013 Off-System Contribution Margin using a simplified forecast and dispatch model. The results, as detailed in Schedule MMS-2 (HC), show a very broad probability distribution with a median value of **[redacted]** and ranging from **[redacted]** to **[redacted]** at the 5% and 95% confidence levels, respectively.

Q: Please describe the methodology used to develop the distribution of 2013 Off-System Contribution Margin.

A: My methodology for 2013 was the same as that used in preparing the Off-System Contribution Margin distributions for the four prior rate cases. The methodology has five primary steps. First, KCP&L provided energy price, fuel price, and load forecasts, and I calculated historical volatilities for input variables, in order to develop 1,000 equally-likely scenarios for each variable. I also constructed 1,000 equally-likely forced outage scenarios for each generating unit in KCP&L's supply portfolio. The scenarios incorporate the correlation between variables, such that if natural gas prices and oil prices are highly correlated, a high gas price scenario will correspond to a high oil price scenario. Second, for each of the 1,000 scenarios, I calculated a daily dispatch cost for each of KCP&L's units. By sorting these dispatch costs from least to greatest, I developed the optimal dispatch order of units for each scenario. Third, I calculated the total available capacity for each unit, taking into account both planned outages and scenario-specific forced outages as well as any long-term sales agreements and load obligations that could reduce the capacity available to serve KCP&L's native load.

Fourth, starting with the most economic unit, I compared each unit's dispatch costs and available capacity with the hourly market prices and native load, respectively. For all units with a dispatch cost less than the market price, the available capacity was assigned to serve first up to 100% of native load with any excess capacity assigned to off-system sales. Fifth, I calculated the hourly contribution margin by subtracting the dispatch cost from the hourly market price and multiplying this difference by the available capacity. The 1,000 scenarios of hourly contribution margin data were aggregated to daily, monthly and annual estimates. Finally, I estimated a distribution of 2013 Margin based on the characteristics of the 1,000 equally-likely scenarios. A description of the key inputs to the analysis is set out in Schedule MMS-3.

Q: What are the market drivers that have caused the 2013 estimates of Margin to decline so significantly?

A: Declining natural gas prices and electricity prices are the single biggest drivers.[11] KCP&L's MIDAS™ forecast of SPP-N electricity prices for 2013 is historically low.

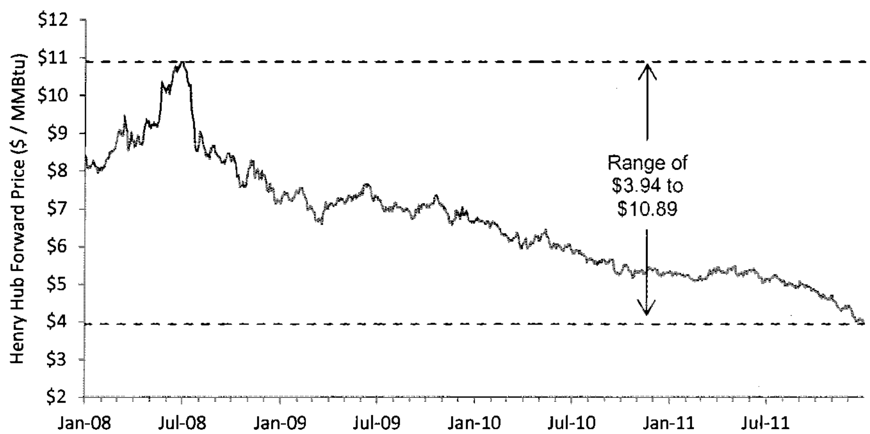
Q: What have been the observed price movements in natural gas forwards for 2013 through the end of 2011?

A: Gas prices have continued their downward movement in 2010 and 2011 – the 2013 Henry Hub Strip has continued to decline from its 2008 peak as shown in Figure 11.

---

[11] A breakdown of the individual components of change in Margin since the 2010 Rate Case is provided later in this section of my testimony.

Figure 11 – Forward Price for 2013 Henry Hub Strip



Q: Is the KCP&L MIDAS™ forecast of very low electricity prices in SPP-N reasonable considering the decline in the traded gas forwards?

A: Yes. KCP&L projects the bilateral market prices in MIDAS™ using a fundamental forecast model. As noted in Section IV of my testimony, the forward market in SPP-N is currently a bilateral market in which equivalent forward strip prices are not directly observable. However, on an historical basis, we can compare the observed bilateral spot prices of electricity in SPP-N with observed Henry Hub natural gas prices. As can be seen in Figure 12 (HC) below, the MIDAS™ projected ATC price for 2013 of **[redacted]**[12], shown as a red dot, is consistent with a gas forward strip for 2013 below **[redacted]** per MMBtu. The 95th and 5th percentile dashed lines represent the 'confidence intervals' for the annual average spot price of electricity in SPP-N, given the level of the Henry Hub natural gas price.

[12] Mean or expected value.

**[redacted]

[redacted]

**

Q: Does this relationship hold for on-peak and off-peak hours as well?

A: Yes, although the relationship is stronger in the on-peak hours as one would expect. Figure 13 (HC) below shows the historical relationship between gas and electricity in off-peak[13] hours, while Figure 14 (HC) shows the on-peak relationship. The tighter 'confidence intervals' for the on-peak hours in Figure 14 (HC) reflect the stronger relationship between gas in those hours, where we would expect to see gas units as the marginal generating unit. In each case (ATC, Off-Peak and On-Peak) the MIDAS™ projection of the bilateral electricity prices for 2013 in SPP-N is reasonable given the 2013 Henry Hub forward strip prices at the time the projection was made.

[13] "Off-Peak Hours" in this testimony refer to all hours not included in the "On-Peak" period, which is comprised of the hours ending 7 AM - 10 PM, Monday-Friday.

[redacted]

[redacted]

Q: Does your probabilistic analysis of Off-System Contribution Margin take account of all possible *force majeure* events?

A: No. My analysis of volatility and correlations is drawn from an examination of historical price changes and relationships. While the dataset upon which I base my analysis is extensive, it can only reflect the frequency and magnitude of risks we have experienced in the past. My analysis and forecast of uncertainty cannot properly account for risks and events that may well happen in the future, but for which there is simply no historical precedent. Certain *force majeure* events, such as the effect of the 2011 flooding of Missouri River on the availability of coal, are not captured in the historical analysis of unit availability.

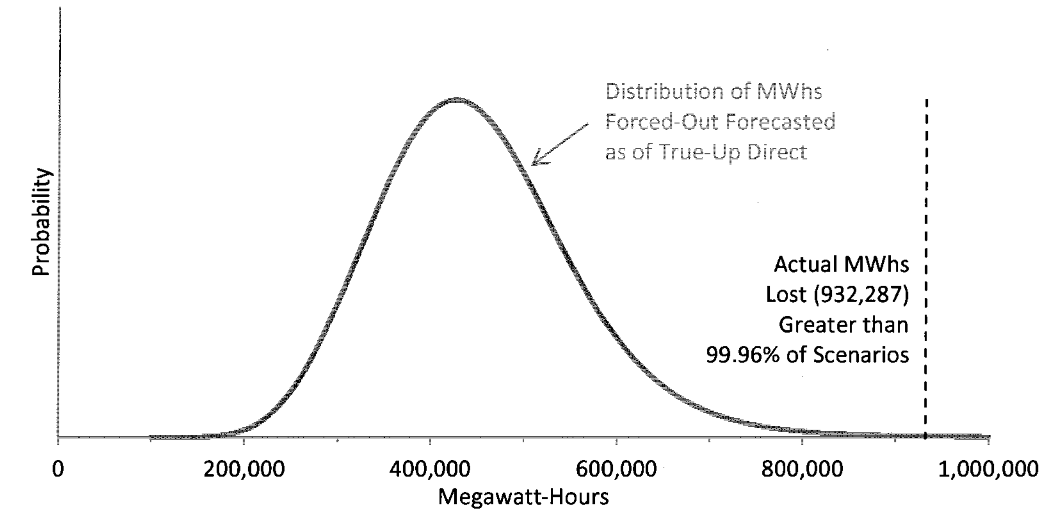
Q: Why are certain *force majeure* events not captured in your data set?

A: In the summer of 2011 the Missouri River flooded to such an extent that it severely affected KCP&L coal plants[14]. Plant operations were disrupted by the flooding and coal deliveries by railroads to the plants were suspended under *force majeure* provisions in the transportation contracts. KCP&L's off-system sales revenues were significantly lower as a result of the flooding[15]. Figure 15 below shows the projected distribution of MWh that would be expected to be unavailable due to forced outages during the Flood Period within the NorthBridge model, based on historic outage parameters for these units.

[14] The details of the flooding's impact on KCP&L coal plant operations, purchased power, and off-system sales are set out in KCP&L's Application for Accounting Authority Order, Case No. EU-2012-0130, filed December 19, 2011.

[15] KCP&L implemented coal conservation efforts from July 2, 2011 to October 12, 2011 (the "Flood Period"). In its Application KCP&L states that coal conservation measures at the coal units reduced the available MWh for both retail customers (132,978 MWh) and off-system sales (799,309 MWh).

Figure 15 – MWH Forced Outages



If each unit had experienced a forced outage rate during Flood Period consistent with its mean expectation[16], the MWh available would have been less than the maximum by 449,129 MWh. In actuality, the total MWh withheld because of the coal conservation program was 932,287 MWH, which is greater than 99.96% of the modeled scenarios in the NorthBridge model[17]. That is equivalent to a 1 in 2,500 year event in my model.

Q: Is an event of this magnitude included within the scope of your analysis?

A: My probabilistic analysis of Off-System Contribution Margin incorporates KCP&L's estimates of the forced outage risk at each of their generating facilities and applies variability around these estimates in the scenarios evaluated. Unless the flood event was actually a 1 in 2,500 year event, the magnitude of the 2011 disruptions was outside the

[16] The units affected were Iatan 1, Iatan 2, LaCygne 1, LaCygne 2, and Hawthorn 5. During the Flood Period, those units would have been capable of producing 5,381,904 MWh of energy had there been no forced outages. Because each unit has some non-zero expected forced outage rate (e.g., Iatan 2 has a forced outage rate of 7.5%), there is some expectation that the total MWh available to be generated will be less than the maximum capable.

[17] Within the NorthBridge model, the actual forced outage rate varies by unit and by month, although on average across all scenarios the average realized forced outage rate equals the expectation. As a consequence, in some scenarios, the realized number of MWh forced out will be higher than the expectation and in other scenarios will be lower. The 5th percentile corresponds to roughly 290,000 MWh forced out and the 95th percentile corresponds to roughly 635,000 MWh forced out.

scope of my analysis presented in Direct Testimony and True-Up Direct Testimony in the 2010 Rate Case.

Q: How is NorthBridge's 2012 Rate Case probabilistic analysis of 2013 Margin different from the true-up probabilistic analysis of Margin you conducted in the 2010 Rate Case?

A: As described previously, my true-up probabilistic analysis in the 2010 Rate Case was filed on February 22, 2011[18] as part of my True-Up Direct Testimony and produced a 25th percentile value of **[redacted]** and a median value of **[redacted]**. The current 2013 analysis described above was based on data supplied by KCP&L as of January 20, 2012, and so reflects updated market data on gas and electricity prices. The current 2013 analysis also looks at a different time period (calendar year 2013 instead of the twelve months ending April 30, 2012), and so load forecasts, outage schedules and forecasts of other variables reflect changes between the two periods.

Q: Have you made any other changes to your analysis?

A: Yes. Based on discussions with KCP&L, my model now assumes that sales may be made either into the SPP-N market, or at a location identified as 'Into-Entergy'. There are finite transmission limits that cap the volume of sales that can be made in each hour at the two locations. I assume that KCP&L will sell excess economic capacity first into the higher priced market and then remaining excess capacity into the lower priced market.

Q: What are the key changes between the 2010 true-up probabilistic analysis and the current probabilistic analysis for 2013?

A: Figure 16 (HC) below shows graphically the individual changes that have resulted in a decrease of the 50th percentile value from **[redacted]** to **[redacted]**. As can

[18] Based on market data and inputs provided to NorthBridge by KCP&L as of January 11, 2011.

be seen, the single biggest driver is the reduction in Energy Prices in SPP-N for 2013 as compared to the forecast period in the 2010 Rate Case. The reduction in energy prices accounts for a decrease in the median value of Margin of **[redacted]**, which is greater than the net overall reduction in Margin. Cumulatively, other offsetting factors account for a net increase of **[redacted]**. The second largest driver is the component identified as 'Lead Time', which refers to the widening of the Margin distribution resulting from forecasting margin eleven months in advance versus only four months in advance at the time of True-Up Direct in the 2010 Case. Coal fuel costs also contributed to a significant drop in Margin. Other significant changes, some of which increase Margin and others of which decrease margin, include delivered natural gas prices, planned outages, wind production and firm load obligation. A more detailed description of these changes is contained in Schedule MMS-4 (HC).

[redacted]

VI. KCP&L PROPOSAL TO SHARE MARGIN RISK

Q: Please elaborate on your fifth conclusion.

A: KCPL has proposed to establish the initial offset for off-system sales margin at the 40th percentile of my probability distribution[19]. In a departure from past proposals for Margin during the last four rate cases, KCPL proposes to share 25 percent of the downside risk with customers below the 40th percentile, while retaining 75 percent of this risk at the Company. Between the 40th percentile and the 60th percentile, all of the excess of realized Margin over the 40th percentile value would be returned to ratepayers[20]. Above the 60th percentile, KCPL proposes to share in 25 percent of the upside difference between realized Margin and the 60th percentile value. The customers would retain the other 75 percent. The sharing mechanism is illustrated in Figure 17 (HC) below.

**[redacted]

[redacted]**

[19] The KCPL proposal is detailed in the Direct Testimony of Company witness Tim M. Rush. The initial offset to revenue requirements would be updated to my 40th percentile value as of the True-Up date.

[20] Subject to the operation of the IEC mechanism described in Mr. Rush's testimony.

Q: How does the proposal allocate risk between KCPL and customers?

A: On an expected basis, KCP&L's proposal would have the Company absorb costs of **[redacted]** from 'unfavorable' outcomes of realized Margin below the 40^{th} percentile. In exchange, the KCPL would be expected to realize benefits of **[redacted]** of 'favorable' outcomes above the 60^{th} percentile. The sharing is illustrated in Figure 18 (HC) below. On balance, KCPL would have a net expected loss of just less than **[redacted]**.

[redacted]

Q: Please summarize your fifth conclusion.

A: KCP&L's proposal to share Margin with customers fairly allocates the risk between the Company and ratepayers. The alignment of incentives to maximize the realized Margin is good public policy and should overcome the objections of incentive incompatibility raised by interveners in prior rate cases.

Q: Does this conclude your testimony?

A: Yes.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Kansas City Power & Light Company's Request for Authority to Implement A General Rate Increase for Electric Service	)))	Case No. ER-2012-0174

AFFIDAVIT OF MICHAEL M. SCHNITZER

COMMONWEALTH OF MASSACHUSETTS)
) ss
COUNTY OF MIDDLESEX)

Michael M. Schnitzer, being first duly sworn on his oath, states:

1. My name is Michael M. Schnitzer. I work in Concord, Massachusetts, and I am employed by The Northbridge Group, Inc. as a Director.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of Kansas City Power & Light Company consisting of thirty-four (34) pages, having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereto, are true and accurate to the best of my knowledge, information and belief.

Michael M. Schnitzer

Michael M. Schnitzer

Subscribed and sworn before me this 27th day of February, 2012.

Patricia Ann LaBombard

Notary Public

My commission expires: June 21, 2013

MICHAEL M. SCHNITZER **Director**

Michael Schnitzer is a co-founder and Director of The NorthBridge Group. He focuses on management consulting and works with clients in regulated industries to address strategy issues central to maximizing performance. Helping clients develop effective responses to increasingly deregulated markets is central to Mr. Schnitzer's work for electric and gas utilities. He has developed initiatives in marketing, pricing, regulatory relations and supply planning. He also has broad experience in utility reorganizations, having served as a financial advisor to secured parties in three utility bankruptcies and has developed and evaluated a wide array of restructuring proposals. Mr. Schnitzer's project assignments have included:

- Helped develop and analyze alternative restructuring plans, including resolution of such issues as residual vertical and horizontal market power, stranded costs, and ultimate organization of the competitive market for generation.

- Analyzed the financial opportunities afforded by restructuring – including leverage, sale/leaseback and splitting off generating assets – to develop strategies for improving competitiveness and increasing shareholder value.

- Analyzed and developed various rate plans designed to return stranded costs to utilities, including appropriate length of transition periods, true-ups, access charges, and the like.

- Assessed transmission capacity and helped develop economically efficient transmission tariffs, including policies for encouraging economic transmission expansions.

- Estimated the likely price of competitive new generation for cogenerators and IPPs as a basis for assisting utilities in planning their pricing, capacity additions, and marketing plans.

- Assessed pricing and shareholder value under alternative regulatory treatments, and formulated several proposals for rate case settlement.

- Analyzed rate levels and asset values under alternative financial structures and ratemaking treatments.

- Assessed short- and long-term opportunities in the wholesale electricity market and developed marketing plans and proposals for specific candidate buyers.

- Analyzed the economics of completing current utility construction programs and evaluated alternative ratemaking treatments of new generating capacity.

- Assessed regulatory policy issues associated with privatization of the electric supply industry in the United Kingdom, including policies to accomplish access to the transmission system.

- Analyzed the economics of municipal takeover of a portion of the franchise area versus continued service by a utility.

- Assisted in the development of acid rain compliance plans, including the merits of policies to require utilities to incorporate monetized environmental externalities in the resource planning process.

- Helped develop comprehensive cost recovery programs, including incentives, for utility-sponsored conservation and load management programs.

Mr. Schnitzer has testified before the public utility commissions of Arkansas, Delaware, Indiana, Maine, Maryland, Massachusetts, New Hampshire, New Mexico, New York, Ohio, Pennsylvania, Rhode Island, Texas, Vermont, and Wisconsin. He is a former adjunct research fellow at the Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University.

Before joining NorthBridge, Mr. Schnitzer was a Managing Director at Putnam, Hayes & Bartlett, Inc., where he co-directed the firm's regulated industry practice. Prior to that he was a member of the executive staff of the Appalachian Mountain Club. His experience as assistant to the executive director included the development of financial models and organizational strategic plans, as well as the negotiation of multi-party real estate transactions and the settlement of environmental litigation.

Mr. Schnitzer received an A.B. in chemistry, with honors, from Harvard University, and an M.S. in management from the Sloan School, Massachusetts Institute of Technology.

SCHEDULE MMS-2

THIS DOCUMENT CONTAINS HIGHLY CONFIDENTIAL INFORMATION NOT AVAILABLE TO THE PUBLIC

<u>**Description of Inputs for Prospective Analysis**</u>

The primary components necessary to estimate the 2013 Off-System Contribution Margin are market electricity prices, fuel prices used to calculate the dispatch costs of KCPL's owned-generation, and native load levels. I calculated volatility and correlation parameters for each variable from historically observed prices and load levels. I then developed forecasts for each of the variables from the present through December 2013. The table describes the data used to develop the 2013 Off-System Contribution Margin distribution.

Variable	Source for Forecast	Source for Volatility and Correlation Estimates
Energy Price	Company Energy Price Forecast for SPP-N and Into-Entergy	Historical Megawatt Daily On-Peak and Off-Peak Day-Ahead Energy Prices
Natural Gas Price	Company SPP-N Delivered Gas Price Forecast	Historical Mid-Continent Natural Gas Spot Prices
Coal Price	Company Delivered Coal Price Forecast	N/A
Oil Price	Company Delivered Fuel Oil Price Forecast	Historical NYMEX NY Harbor No 2 Fuel Oil Spot Prices
SO_2 Price	Company SO_2 Allowance Price Forecast	N/A
NOX Price	Company NOX Allowance Price Forecast	N/A
KCPL Native Load	Company Load Forecast	Historical Hourly Company Load
Forced Outage Rate	Company Budget Assumptions	N/A
Planned Outage Rate	Company Budget Assumptions	N/A

SCHEDULE MMS-4

THIS DOCUMENT CONTAINS HIGHLY CONFIDENTIAL INFORMATION NOT AVAILABLE TO THE PUBLIC