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Witness: Lena M. Mantle
Sponsoring Party: MoPSC Staff
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MISSOURI PUBLIC SERVICE COMMISSION

UTILITY OPERATIONS DIVISION

SURREBUTTAL TESTIMONY

OF

LENA M. MANTLE

UNION ELECTRIC COMPANY d/b/a

AMERENUE

CASE NO. EC-2002-1

Jefferson City, Missouri
June 24, 2002

Exhibit No. 23
Date 7/10/02 Case No. EC-2002-1
Reporter Kim

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

The Staff of the Missouri Public Service Commission, Complainant,	)	
vs.	)	Case No. EC-2002-1
Union Electric Company, d/b/a AmerenUE, Respondent.	)	

AFFIDAVIT OF LENA M. MANTLE

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

Lena M. Mantle, of lawful age, on her oath states: that she has participated in the preparation of the following written Surrebuttal Testimony in question and answer form, consisting of 20 pages of testimony to be presented in the above case, that the answers in the attached written Surrebuttal Testimony were given by her; that she has knowledge of the matters set forth in such answers; and that such matters are true to the best of her knowledge and belief.

Lena M. Mantle
Lena M. Mantle

Subscribed and sworn to before me this 21st day of June, 2002.

DAWN L. HAKE
Notary Public – State of Missouri
County of Cole
My Commission Expires Jan 9, 2005

Dawn L. Hake
Notary Public

My commission expires

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SURREBUTTAL TESTIMONY

OF

LENA M. MANTLE

UNION ELECTRIC COMPANY

d/b/a AMERENUE

CASE NO. EC-2002-1

Q. Please state your name and business address.

A. My name is Lena M. Mantle and my business address is Missouri Public Service Commission, P. O. Box 360, Jefferson City, Missouri 65102.

Q. Are you the same Lena M. Mantle who submitted direct testimony in this case?

A. Yes, I am.

Q. What is the purpose of your surrebuttal testimony?

A. The purpose of my testimony is to address several issues regarding normalization of customer usage that impact the revenue calculation in this case, as well as issues regarding the net system input used to calculate the normalized fuel and purchase power expenses. My discussion of customer usage normalization issues will address the rebuttal testimony of AmerenUE (UE) witness Richard A. Voytas regarding the weather normalization of customer usage and the need to include Staff's Days Adjustment to customer usage. With respect to net system input issues, I will show that the normalized net system input used by Staff in determining normalized fuel and purchase power costs is more

appropriate to use than the net system input used by UE in its estimate of fuel and purchase power costs. I will describe how Staff properly applied losses to customer growth in response to UE witness Mr. Richard J. Kovach.

Q. Would you summarize the recommendations to the Commission that you make in this testimony?

A. Yes, I will. The following four points summarize the recommendations contained in my testimony.

1. The Commission should adopt the weather adjustment to customer usage shown on Schedule 2 of my direct testimony filed on March 1, 2002.

2. The Commission should adopt the Days Adjustment to customer usage as shown on Schedule 2 of my direct testimony filed on March 1, 2002.

3. The Commission should adopt the net system input used by Staff to calculate the fuel and purchase power costs that is summarized in Schedule 1 attached hereto.

4. The Commission should order UE to submit to the Commission's Energy Department, UE's hourly net system input along with the other information provided to the Staff in compliance with 4 CSR 240-20.080.

WEATHER NORMALIZATION ADJUSTMENT TO CUSTOMER USAGE

Q. Does UE disagree with the methodology that you used to weather normalize customer usage?

A. No, they do not. Despite several pages of rebuttal testimony written by Mr. Voytas decrying the methodology that I used to calculate a weather adjustment to

customer usage [Voytas Rebuttal, pages 3-5], UE used the same methodology in developing the adjustment to customer usage for its revenue normalization. While Mr. Voytas did not state in his rebuttal testimony that the same method was used, but a careful comparison of his Schedules 1 and 2 shows this to be the fact. Mr. Voytas' Schedule 1 shows the Staff weather adjustments using ranked normal weather variables along with the results of the same methodology using unranked normal weather variables. His Schedule 2 shows a comparison of the weather adjustments recommended by UE and Staff. The results of the weather normalization using unranked normal variables on Schedule 1 and UE's weather adjustments on Schedule 2 are the same. Therefore, the only difference between the Staff and UE weather adjustments is the normal weather variables used. In fact, as stated on page 2, lines 12-21, of my July 2001direct testimony and page 3, lines 5-13, of my March 2002 direct testimony, I did not do an independent weather normalization analysis. Instead I adopted weather adjustments calculated by UE.

Q. How long has UE been using this methodology to weather normalize its customer usage?

A. UE has been using this methodology since approximately 1993 to calculate weather normalized calendar and billing month sales. In his testimony, Mr. Voytas states that this computer program was designed at the Staff's specific request using the Staff's preferred methodology. [Voytas Rebuttal, page 4, lines 17–19] This statement is incorrect. I was working for the Commission in the area of weather normalization at that time. UE did not have the program designed at Staff request using Staff's preferred methodology. The upper-management of UE had asked its Corporate Planning Department to find a way to weather normalize customer usage on a monthly basis. Staff had shown UE the methodology

that we had developed using class loads to develop weather response patterns in order to estimate a weather adjustment to customer usage. After a review of the weather normalization software commercially available at the time, UE's Corporate Planning Department contracted with ICF Consultants to develop the weather normalization module of the Hourly Electric Load Model (HELM), incorporating many of the fundamental characteristics of the Staff's method. This is the same model that UE used in this case to weather normalize customer usage.

Q. Has UE expressed satisfaction with its adopted methodology to the Staff?

A. For the most part, yes. Within the past few months, however, UE has expressed to Staff some concern with how the class level weather normalized usage fluctuates for each month across the years. As a consequence, UE is in the process of developing a new methodology for weather normalizing customer usage. As explained to Staff, this new methodology is similar to the current methodology in that it uses daily class loads to estimate a weather response pattern, and then uses that pattern to calculate a weather adjustment to customer usage. At this time, it appears that UE's new methodology has not been fully implemented, since this new methodology was not used to calculate weather adjustments to customer usage in UE's rebuttal testimony in this case.

Q. So what accounts for the differences between Staff's and UE's weather adjustments to customer usage in this case?

A. The difference in the weather adjustments is due to the difference in the method used to develop the normal weather variables used to calculate the weather adjustment. The methodology used to calculate the normal weather variables in Staff's calculation ranks the weather variables within each year in the history, from highest to

lowest, the daily temperatures for each year in the history, prior to calculating normal weather variables by averaging the temperatures corresponding to each rank. The methodology used by UE for its weather adjustment calculation is a smoothing method that just averages the temperatures across each day in the history. Staff witness Dr. Michael S. Proctor explains in his surrebuttal testimony why the normal weather variables used to calculate the weather adjustments adopted by Staff are more accurate than those used by UE.

Q. Were the normal weather variables used to calculate Staff's weather adjustments calculated by Staff?

A. No. The fact is that UE has been calculating weather adjustments to customer usage using the ranking methodology to estimate normal weather variables since it began reporting monthly weather normalized sales in 1993. The "ranked" normal variables were calculated by UE in HELM using its own data inputs. Only recently has UE started also calculating a weather adjustment using the "smoothed" normal variables. During the test year, UE calculated weather adjustments using both sets of normal variables. UE did not have to re-do any of its analysis in order to supply the Staff with weather adjustments using ranked normal variables.

Q. Why did you choose to adopt the weather adjustments using ranked normal variables?

A. Analytically, as shown in Dr. Proctor's surrebuttal testimony, ranking results in a more accurate normal. Staff has been using a similar ranked normal in every electric rate increase, rate decrease and rate design case in which weather normalization adjustments to sales have been made since 1991 including UE's last rate design Case No. EO-96-15. This encompasses all of the regulated investor owned utilities in Missouri including UE. This

directly contradicts Mr. Voytas' assertion that Staff chose to use ranked normals solely to minimize weather adjustments to sales [Voytas Rebuttal, page12 lines 8-9]. Staff has consistently utilized ranked normal variables in cases before the Commission, not to obtain a certain result, but because it is the analytically correct method to calculate normal weather.

Q. Has the methodology used to calculate normal weather been an issue in any of these cases prior to this case?

A. In the thirteen cases over the past eleven years in which the Staff has used ranked normal variables, weather normalization went to hearing only once; in the Missouri Public Service rate case (Case No. ER-97-394). In that case, the Commission ruled in favor of the Staff. In none of the other cases has the calculation of normal weather variables been an issue.

Q. What should be the goal in calculating a weather adjustment to test year sales?

A. I agree with UE witness Richard A. Voytas that, "The goal of all of the parties, and the Commission, should be to calculate a weather normalization adjustment to test year sales that is as accurate as possible, not one that either minimizes or maximizes the adjustment." [Voytas Rebuttal, page 6, lines 15-18.] Because of the increased accuracy of ranked normal weather variables as described in Dr. Proctor's testimony, I recommend that the Commission adopt the weather adjustments to test year sales shown in my March 2002 direct testimony as the most accurate weather normalization adjustment.

DAYS ADJUSTMENT TO CUSTOMER USAGE

Q. What other customer usage normalization are you going to address in this testimony?

A. I am going to describe the Days Adjustment that I recommended in my March 2002 direct testimony on page 3 lines 14-20 and explain to the Commission why it is important that such an adjustment be made.

Q. Why should a Days Adjustment be made to customer usage?

A. The weather and revenue normalization analysis conducted by both Staff and UE is on a billing month basis. Billing month usage is the sum of all sales to every customer billed during a billing month. Billing month usage will include usage in both the current and previous month because the readings of customer meters are spread out across the calendar month. UE's customers are divided into billing cycles with each billing cycle being read once during each calendar month. However, the billing cycles are read on different days of the month, resulting in usage that occurred across different time periods being included in a billing month. For example, if the first billing cycle in June 2002 is read on the first working day of the month, which happens to be June 3, it would contain mostly usage that occurred in May. If the last billing cycle is read on the last working day of June 2002, which happens to be June 28, it would contain almost exclusively usage that occurred in June. Because meters are read on working days, a billing cycle may contain anywhere from 28 to 32 days. Across a year, the sum of the number of days in the year for each billing cycle will be close to 365 but it may be 364 or 367. The Days Adjustment is necessary to adjust the usage to a calendar year.

In this case, the Days Adjustments for the Residential, Large General Service and Large Power customer classes were positive, indicating the that majority of the billing cycles had less than 365 days of usage. The number of days in the billing cycles varies across customer classes when aggregated across 12 billing months because the distribution of the

type of customers in each billing cycle varies. The Days Adjustments for the Small General Service and Small Power Classes were negative, indicating that the majority of their billing cycles had more than 365 days of usage. The total for all classes was a positive adjustment so if the Days Adjustment is not made, the normalized revenues would be less than the revenue that is collected for a full year and the fuel and purchase power costs will be lower than required to meet the customer usage over a full year.

Q. Did UE make an adjustment to assure that the usage in its case covers 365 days?

A. No, it did not. To calculate revenues and the net system input, UE took its booked sales, which is on a calendar basis, and added its unbilled usage back in, which results in its billing month sales. Even though UE made some adjustments to customer usage, it did not include an adjustment that would ensure that a full year's worth of usage was accounted for.

Q. What is the adjustment that you are recommending?

A. In my direct testimony, I recommend a total adjustment of 30,352,000 kilowatt hours resulting in a positive revenue adjustment of $1,604,427 as calculated by Staff witness Janice Pyatte and shown in her direct testimony on Schedule 3.

NORMALIZATION ADJUSTMENTS TO NET SYSTEM INPUT

Q. Which UE witness provided rebuttal to the normalized net system input used by the Staff in determining fuel and purchase power costs?

A. Richard A. Voytas provided rebuttal testimony on net system input. He stated that the method that I used had, in his opinion, several flaws, which I summarize below.

1. Use of the same weather to normalize both AmerenUE and Ameren Energy Marketing (AEM) [Voytas Rebuttal, page 13]
2. Use of two different models to estimate the weather normalized hourly loads for UE [Voytas Rebuttal, page 14]
3. Use of an average annual energy loss multiplier instead of hourly loss multipliers [Voytas Rebuttal, page 15]

In addition, Mr. Voytas states that Staff's results do not meet his reasonableness checks [Voytas Rebuttal, page 15].

Q. As to Mr. Voytas' first assertion, did you use the same weather to normalize both UE and AEM?

A. No, I did not because I did not weather normalize AEM. I did use the same weather to normalize both UE and Ameren total system, which includes AEM. It is Staff's position that to get an accurate estimate of total fuel and purchase power costs requires that the costs be allocated via the Joint Dispatch Agreement (JDA). To properly estimate the costs to be allocated by the JDA, normalized net system input is necessary for both UE and AEM. I agree with Mr. Voytas that in order to correctly model AEM's system, weather variables should be created using weather that AEM's customers experienced [Voytas Rebuttal, page 13, lines 8-19]. I did not have the weather database or the resources to create the correct weather for normalizing AEM. However, I did have weather available for St. Louis that I used in normalizing the UE loads. Because the majority of Ameren's net system input is UE's customer usage, which is centered in St. Louis, I chose to weather normalize the total Ameren load. The difference between the weather normalized Ameren

and UE net system input is the weather normalized AEM net system input, which was used to allocate the fuel and purchase power cost.

Q. Is Mr. Voytas concern regarding the use of two different models valid?

A. No, it is not. The Staff used only one model to calculate weather normalized net system input. Mr. Voytas was correct in that a different model was used to calculate weather adjustments to class usage. That was necessary because the class usage was on a billing month basis and the net system input is hourly. The same model cannot be used to weather normalize both.

However, a comparison of the weather adjustment to customer usage and the weather adjustment to net system input is a good check for reasonableness. The results showed that the adjustments were very comparable. That is most likely due to the important similarities in the model used to weather normalize customer usage and the model used to weather normalize net system input. The model used to calculate a weather adjustment to customer usage incorporates the use of daily data to model the response of the usage of each class to weather. The model that I use to weather normalize net system input also uses daily data to calculate weather adjustments. The use of ranked normal weather variables to calculate weather adjustments in both models is another example of how the two models are similar. The use of a smoothed normal such as that recommended by UE would result in a discrepancy between the results of the two models.

Q. Referring to Mr. Voytas' third alleged flaw, was it incorrect for you to use an average annual energy loss multiplier in your normalization of net system input?

A. No, it was not. Average annual energy losses are used in Staff's method for normalizing net input at the point that the net system input is reconciled to the normalized

customer usage. This usage was an aggregated annual number. To use any type of loss multiplier other than an average annual loss factor would be inconsistent with the normalized customer usage data.

Q. What losses does Mr. Voytas suggest that Staff should use?

A. Mr. Voytas suggests that hourly, class specific loss multipliers would be more appropriate [Voytas Rebuttal, page 15 lines 11-14].

Q. Is it not true that losses vary from hour to hour?

A. It is true that losses vary from hour to hour and that losses are typically greater in the summer than in the winter. The fact is that Staff's method of weather normalizing net system input implicitly accounts for these variations. Each hour in the actual net system input consists of both the customer requirements and the actual losses for that hour. The net system input daily average energy that is weather normalized in Staff's method includes average hourly losses. Each daily peak includes the losses for that hour. As the average daily energy and peaks are weather normalized, losses are normalized along with customer usage on that day and hour. Because of this, the Staff's method accounts for day-to-day and hour-to-hour variations in losses. It would be improper to use hourly losses, as suggested by Mr. Voytas, since Staff did not have hourly customer usage but only net system input that already includes losses. The average annual loss factor is used only to calculate losses that should be applied to the normalized annual customer usage. Then the net system input is reconciled to this loss-adjusted, normalized customer usage so that fuel and purchase power costs can be estimated that correspond to the normalized usage.

Q. Did UE use a loss multiplier in its calculation of its net system input?

A. Yes. Even though Mr. Voytas and UE witness Mr. Kovach stress the importance of using disaggregated losses, UE witness Tim Finnell used an average annual loss multiplier in the creation of UE's normalized net system input in the same manner that I used in the development of Staff's normalized net system input.

Q. Do you agree with Mr. Voytas that reasonableness checks show your method to be flawed?

A. No, I do not agree that his reasonableness checks show that the method I used is flawed. I do agree with Mr. Voytas that reasonableness checks should be done and that the reasonableness checks that he conducted are valid. However, the application and interpretation of the results of his reasonableness checks are incorrect.

First Mr. Voytas identifies a check that he did on the magnitude and direction of the monthly weather for June 2001 [Voytas Rebuttal, page 15 line 15 – page 16 line 6]. His check showed that his normal weather variables for June indicated that June was cooler than normal and my total adjustments for June indicated that it was hotter than normal. I reviewed my analysis to try to understand why this discrepancy was occurring. I discovered that I had used the wrong history in developing the ranked normal weather variables used in the weather normalization of the net system input. Staff and UE came to an agreement regarding the weather history that should be used to calculate normal weather variables in Case No. EM-96-149. I thought that I had used this data set. After discovering my mistake, I calculated normal weather variables using the correct weather history and corrected the normalization of the net system input. I supplied the revised net system input to Staff witness Leon Bender, who has included this updated net system input in his updated fuel and

purchase power cost estimate. Summaries of the revised UE and Ameren net system input are attached as Schedule 1-1 and 1-2, respectively, hereto.

Q. Did this mistake affect the weather normalization of customer usage?

A. No, it did not. The normal weather variables used in the weather normalization of the customer usage were calculated by UE using the agreed upon weather history.

Q. Did this impact your analysis in any other way?

A. It narrowed the difference between the weather normalized net system input and the normalized customer usage. Prior to this correction, the difference was approximately one percent. Mr. Voytas calculated the effect of this 1 percent to be approximately $19 million in annual revenue [Voytas Rebuttal, page 14, line 23 – page 15 line 2]. While one percent represents good accuracy, after this correction, the difference is 0.13 percent. Using Mr. Voytas' method of calculating revenue impact, the 0.13 percent difference is worth approximately $250,000 in annual revenue out of approximately $1,900,000,000 total annual revenue. This is extraordinary accuracy for any type of modeling.

The revised normal weather variables also reduced the normalized net system input for Ameren resulting in a reduction in the net system input for AEM. Therefore, the fuel and purchase power costs for UE were less after the allocation of costs via the JDA than they were prior to this change.

Q. What other reasonableness checks did Mr. Voytas conduct on your analysis?

A. Mr. Voytas compared the normalized system peak that I calculated with the peak used by UE for resource planning [Voytas Rebuttal, pages 16 – 19]. He concludes that

the reason that the net system peak from my analysis was so close to the peak that UE used for capacity planning was the "... luck of the draw ..." [Voytas Rebuttal, page 18, lines 19-20]. I would argue that the closeness of the peaks was not the "luck of the draw" but a check that shows my results to be reasonable.

Q. Did you calculate a new annual peak when you corrected your analysis using the correct normal weather?

A. Yes, I did. The revised normalized annual peak shown as shown on Schedule 1 is 7,876 megawatts (MW).

Q. Did you review the annual peak of the net system input used by UE?

A. Yes, I did. The annual peak of the net system input used by UE is 7,462 MW.

Q. What was the peak used by UE for resource planning?

A. The weather normalized peak used by UE for resource planning for 2001 was 8033 MW, which is 1.95% higher than Staff's normalized peak and 7.11% higher than UE's normalized peak.

Q. Should the Commission be concerned that Staff's peak is different from the annual peak used by UE for resource planning?

A. No. There are several reasons. The first is that these peaks are calculated for two entirely different purposes. The peak that UE uses for resource planning is a predicted normalized peak [Voytas Rebuttal, page 17, lines 14-15]. The peak from my analysis is the actual peak I normalized for weather and other known factors. There are other random factors that affect the actual annual peak that cannot be modeled. Staff's method preserves these random factors in its normalization. UE's predicted peak does not incorporate these non-measurable, random factors that impacted peak in the test year. Comparing UE's

normalized predicted peak used in resource planning with Staff's weather normalized peak is like comparing apples to pears.

Q. Did Staff predict a peak for the test year?

A. Yes. Although Staff uses normalized peaks in developing the normalized net system input, the method that I use also estimates a predicted peak and average energy for each day in the test year. The maximum predicted peak for the test year from Staff's analysis was 7,966 MW. This is 0.84% lower than the weather normalized predicted peak that UE uses in its resource planning process.

Q. Why are Staff's results so close to UE's weather normalized predicted peak?

A. Staff's results are close because Staff's method incorporates many of the same aspects of modeling that the Mid America Interconnected Network, Inc. (MAIN) requires UE to use to weather normalize its system peak for resource planning. MAIN requires that the peak be adjusted to the usage of a day with a temperature that is the average of the hottest day of the year over a set of years [Voytas Rebuttal, page 17, lines 5-7]. This is the same concept as the ranking method that Staff uses in calculating its normal weather variables. MAIN also requires that an "S" shaped curve be fitted through the daily peaks to estimate the weather normalized peak [Voytas Rebuttal, page 17 lines 8-14]. Staff estimates this "S" shaped curve using linear splines. Staff's results are close to UE's weather normalized peaks due to the inclusion of these two fundamental characteristics in each of the methods.

Q. Did Mr. Voytas do any other reasonableness checks on the Staff's peak load?

A. Yes, he did. He did two other checks on the Staff's peaks. First he compared the actual peak used in my July 2, 2001 direct testimony filing with the actual peak in my

March 1, 2002 direct testimony filing [Voytas Rebuttal, page18 lines 2-11]. The difference between the actual loads shown in my July 2001 and March 2002 direct testimony are due to differences in the hourly loads supplied to me by UE. For my July 2001 filing, I started with the net system loads that UE submits to Staff monthly in compliance with 4 CSR 240-20.080. In the course of my reasonableness checks, I discovered that the hourly loads that were being supplied were not actually net system inputs as labeled in UE's submissions. After discussion with UE witness Tim Finnell, I discovered that the loads were gross loads, containing both station use and the usage of AEM's wholesale customers in Missouri. For my July 2001 filing, I had to estimate the net system input for UE [page 4]. For my March 2002 filing, instead of using the data that Staff receives in the 4 CSR 240-20.080 data, I used data obtained from UE through Staff Data Request No. 2910. This data still required adjusting to remove AEM's Missouri wholesale customers from what was designated as UE's net system loads. I am confident that, based on several discussions with UE witness Tim Finnell, the loads that I used for the March 2002 filing are accurate.

Q. Is UE required to send net system loads in compliance with 4 CSR 240-20.080?

A. 4 CSR 240-20.080 requires the Missouri regulated electric companies to submit net hourly generation for each generating unit and hourly purchases and sales (4 CSR 240-20.080(C) and (D)). The sum across each hour should be net system input. However, the generating unit information that UE supplies to Staff is for all of Ameren, not just UE. Therefore, totaling the net generation unit information does not result in UE's net system input. In order to avoid this error in the future and to enable the Staff to have the data readily available, I recommend that the Commission order UE to submit its hourly net system input

without AEM's Missouri wholesale customers in addition to the 4 CSR 240-20.080 data currently submitted to the Energy Department every month.

Q. Did using a different starting point affect your results?

A. Yes, it did. For my March 2002 direct filing, I did a completely new analysis but used the same method as I used in my July 2001 filing. I did not just revise my previous analysis. The different starting points did affect my results; however, using the more accurate input data supplied to me for the March 2002 filing resulted in a more accurate and reasonable output.

Q. What other reasonableness check did Mr. Voytas conduct on the system peak that purports to points out a flaw in Staff's method?

A. Mr. Voytas pointed out that the actual peak in the test year occurred in August 2000 and that Staff's weather normalized peak occurs in July 2000 [Voytas Rebuttal, page 18, lines 7-8].

Q. Is this a flaw in your method?

A. No, it is not. The peak moved to a different month in the normalization because the weather history shows that the maximum temperature normally occurs in July and not August. Staff's ranking method of calculating normal weather variables also tracks when the rank, in this case the hottest day of the year, typically occurs. Since the peak typically occurs on the day of the maximum temperature and the maximum temperature typically occurs in July, the weather adjustments to daily peaks resulted in the Staff's normalized peak occurring in July 2000, not August 2000.

Q. What is UE witness Richard J. Kovach's concern with the net system input?

A. Mr. Kovach is concerned that I applied the average annual system loss factor to the customer growth adjustment prior to the reconciliation of net system input to normalized customer usage.

Q. Is Mr. Kovach's concern valid?

A. Mr. Kovach's concern is theoretically valid but in practice it is impossible to successfully address. Mr. Kovach correctly states that the losses associated with customer growth would be different from the average annual system losses. However, if the assumption is made that the voltage level profile of customer growth usage is consistent with the voltage level profile of the UE's total usage prior to the growth, using average annual system losses is appropriate. While it is doubtful that the voltage profile of the growth usage is completely consistent with the voltage profile of the total usage, the difference is likely to be very small. While Mr. Kovach points out the inconsistency of using an annual system loss factor, he does not provide any testimony that shows that the assumption of growth being consistent with current voltage level is invalid. Therefore, it is reasonable to apply the average annual system loss factor to the usage growth.

Q. Please explain your understanding of how UE derived the hourly loads that it used to estimate fuel and purchase power expense.

A. There was no rebuttal testimony from UE describing how the net system input that it used was derived. The following description of how the load were derived is my understanding of what UE did after I talked with Tim Finnell and reviewed his work papers.

The hourly loads were developed by first adjusting each month's booked sales (calendar month) for billing month weather. An unbilled adjustment was made to this usage in each month using the total annual unbilled sales allocated to each month based on each

month's booked usage. UE then applied the same total system loss factor to this monthly usage in the same manner that Staff for uses. Each month's usage was then allocated to the hours based on the actual hourly loads for the corresponding month. No analysis was conducted on daily or hourly loads.

Q. Why should the Commission adopt the Staff's net system input instead of UE's?

A. The most important reason for using Staff's loads is because Staff is very careful to make sure that the net system input is a normalization of the net system input of the test year itself. Staff starts with the weather normalization of the net system input, weather normalizes average daily usage and peak load for each day, and reconciles it to the usage it uses to calculate normalized revenues. As discussed previously in my testimony, this reconciliation yielded a very small difference (0.13%.) UE takes a combination of annual and billing month adjustments, applies them to calendar month sales and allocates this usage to the hours based on actual hourly net system input of the corresponding month. Therefore, UE's emphasis is on monthly usage not daily average usage and peak loads.

This is illustrated in the following comparison of the actual and normalized annual peaks.

Table 1
Comparison of Annual Peaks

	Actual	Normal
UE Resource Planning	8104	8033
UE Production Cost Model Input	7832	7462
Difference	272	572
Staff Production Cost Model Input	8084	7876

Mr. Voytas states that "The bottom line is that there should be one normalized system peak number that is used for both production costing and resource planning" [Voytas Rebuttal, page 19, lines 15-16]. If it is indeed as critical for the peak of the hourly loads used in the production cost estimates be the same as the peak used for resource planning as Mr. Voytas states, the Commission should adopt Staff net system input because its resulting annual peak is the closest to UE's resource planning peak. However, Staff does not believe that should be the sole criterion on which that the Commission bases its decision. The Commission should adopt the Staff's net system input because the Staff's method is sound in theory and has shown to be accurate in its results.

Q. Please summarize your recommendations in the conclusion of your testimony.

A. The following summarizes my recommendations to the Commission.

1. The Commission should adopt the weather adjustment to customer usage shown on Schedule 2 of my direct testimony filed on March 1, 2002.

2. The Commission should adopt the Days Adjustment to customer usage as shown on Schedule 2 of my direct testimony filed on March 1, 2002.

3. The Commission should adopt the net system input used by Staff to calculate the fuel and purchase power costs that is summarized in Schedule 1 attached to this testimony.

4. The Commission should order UE to submit to the Commission's Energy Department, UE's hourly net system input in addition to the information already provided to the Staff in compliance with 4 CSR 240-20.080.

Q. Does this conclude your surrebuttal testimony?

A. Yes, it does.

AmerenUE

Net System Load

Normalized Year Ending 6/2001 - Settlement Weather

EC-2002-1

Month	Monthly Usage (MWh)				Monthly Peaks (MW)				Load Factor	
	Actual	Normal	Adj	% Adj	Actual	Normal	Adj	% Adj	Actual	Normal
Jul-00	3,780,752	3,854,317	73,565	1.95%	7,665	7,876	211.80	2.76%	0.663007	0.657732
Aug-00	4,110,878	3,753,739	(357,139)	-8.69%	8,084	7,603	(481.42)	-5.96%	0.683476	0.663617
Sep-00	3,192,776	3,076,940	(115,837)	-3.63%	7,782	7,266	(516.63)	-6.64%	0.569800	0.588173
Oct-00	2,846,767	2,780,516	(66,250)	-2.33%	5,854	5,447	(407.53)	-6.96%	0.653592	0.686147
Nov-00	2,974,838	2,880,806	(94,033)	-3.16%	5,416	5,356	(59.63)	-1.10%	0.762920	0.747030
Dec-00	3,710,118	3,413,887	(296,231)	-7.98%	6,319	6,119	(200.27)	-3.17%	0.789168	0.749925
Jan-01	3,467,352	3,565,812	98,461	2.84%	5,974	6,246	272.33	4.56%	0.780099	0.767276
Feb-01	2,947,146	3,029,525	82,379	2.80%	5,918	6,101	182.35	3.08%	0.741023	0.738968
Mar-01	3,028,347	3,005,406	(22,941)	-0.76%	5,087	5,245	157.50	3.10%	0.800082	0.770177
Apr-01	2,700,064	2,595,092	(104,972)	-3.89%	5,617	4,684	(932.46)	-16.60%	0.667637	0.769409
May-01	2,986,997	2,812,425	(174,572)	-5.84%	6,736	5,776	(960.63)	-14.26%	0.595990	0.654491
Jun-01	3,371,111	3,334,329	(36,782)	-1.09%	7,309	7,157	(151.88)	-2.08%	0.640598	0.647054
Annual	39,117,146	38,102,793	(1,014,352)	-2.59%	8,084	7,876	(207.86)	-2.57%	0.552363	0.552239
Summer	14,455,517	14,019,324	(436,193)	-3.02%	8,084	7,876	(207.86)	-2.57%	0.610695	0.607898
Other	24,661,628	24,083,469	(578,159)	-2.34%	6,736	6,246	(489.86)	-7.27%	0.627742	0.661100

Schedule 1-1

Total Ameren
Net System Load
Normalized Year Ending 6/2001 - Settlement Weather
EC-2002-1

Month	Monthly Usage (MWh)				Monthly Peaks (MW)				Load Factor	
	Actual	Normal	Adj	% Adj	Actual	Normal	Adj	% Adj	Actual	Normal
Jul-00	4,942,076	5,328,279	386,203	7.81%	9,902	10,655	752.58	7.60%	0.670835	0.672171
Aug-00	5,487,631	5,168,713	(318,918)	-5.81%	10,698	10,177	(521.31)	-4.87%	0.689457	0.682654
Sep-00	4,376,401	4,334,654	(41,747)	-0.95%	10,302	9,887	(414.70)	-4.03%	0.590017	0.608899
Oct-00	3,963,988	3,972,281	8,294	0.21%	7,758	7,387	(371.49)	-4.79%	0.686748	0.722795
Nov-00	4,144,719	4,115,594	(29,125)	-0.70%	7,437	7,535	97.69	1.31%	0.774053	0.758648
Dec-00	5,073,485	4,833,109	(240,376)	-4.74%	8,503	8,505	1.87	0.02%	0.801939	0.763776
Jan-01	4,772,194	4,994,750	222,556	4.66%	8,052	8,618	565.88	7.03%	0.796629	0.779030
Feb-01	4,117,880	4,310,249	192,369	4.67%	8,150	8,595	445.20	5.46%	0.751887	0.746247
Mar-01	4,241,144	4,303,952	62,807	1.48%	7,049	7,398	348.33	4.94%	0.808640	0.781976
Apr-01	3,770,567	3,726,586	(43,981)	-1.17%	7,352	6,628	(723.97)	-9.85%	0.712305	0.780893
May-01	4,137,759	4,001,936	(135,822)	-3.28%	8,971	7,916	(1,055.48)	-11.76%	0.619916	0.679511
Jun-01	4,627,409	4,677,795	50,386	1.09%	9,764	9,783	18.57	0.19%	0.658217	0.664121
Annual	53,655,254	53,767,900	112,645	0.21%	10,698	10,655	(43.52)	-0.41%	0.572537	0.576082
Summer	19,433,518	19,509,442	75,924	0.39%	10,698	10,655	(43.52)	-0.41%	0.620406	0.625373
Other	34,221,736	34,258,458	36,722	0.11%	8,971	8,618	(353.78)	-3.94%	0.654071	0.681654

Schedule 1-2