Exhibit No.:	________________
Issue(s):	Production Allocators
Witness/Type of Exhibit:	Meisenheimer/Direct
Sponsoring Party:	Public Counsel
Case No.:	ER-2010-0036

DIRECT TESTIMONY

OF

BARBARA A. MEISENHEIMER

Submitted on Behalf of
the Office of the Public Counsel

UNION ELECTRIC COMPANY D/B/A AMERENUE

Case No. ER-2010-0036

January 6, 2010

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a AmerenUE for Authority to File Tariffs Increasing Rates for Electric Service Provided to Customers in the Company's Missouri Service Area.	)))))	**Case No. ER-2010-0036**

AFFIDAVIT OF BARBARA A. MEISENHEIMER

STATE OF MISSOURI)
) ss
COUNTY OF COLE)

Barbara A. Meisenheimer, of lawful age and being first duly sworn, deposes and states:

1. My name is Barbara A. Meisenheimer. I am a Chief Utility Economist for the Office of the Public Counsel.

2. Attached hereto and made a part hereof for all purposes is my direct testimony.

3. I hereby swear and affirm that my statements contained in the attached affidavit are true and correct to the best of my knowledge and belief.

Barbara A. Meisenheimer

Barbara A. Meisenheimer

Subscribed and sworn to me this 6th day of January 2010.

NOTARY PUBLIC NOTARY SEAL STATE OF MISSOURI

SHYLAH C. BROSSIER
My Commission Expires
June 8, 2013
Cole County
Commission #09812742

Shylah C. Brossier

Shylah C. Brossier
Notary Public

My commission expires June 8th, 2013.

AmerenUE

ER-2010-0036

Direct Testimony
of
Barbara Meisenheimer

Q. PLEASE STATE YOUR NAME, TITLE, AND BUSINESS ADDRESS.

A. Barbara A. Meisenheimer, Chief Utility Economist, Office of the Public Counsel, P. O. Box 2230, Jefferson City, Missouri 65102. I am also an adjunct instructor for William Woods University.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL AND EMPLOYMENT BACKGROUND.

A. I hold a Bachelor of Science degree in Mathematics from the University of Missouri-Columbia (UMC) and have completed the comprehensive exams for a Ph.D. in Economics from the same institution. My two fields of study are Quantitative Economics and Industrial Organization. My outside field of study is Statistics. I have taught economics courses for the University of Missouri-Columbia, William Woods University, and Lincoln University, mathematics for the University of Missouri-Columbia and statistics for William Woods University.

Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE THE COMMISSION?

A. Yes, I have testified on numerous issues before the Missouri Public Service Commission. (PSC or Commission).

Q. WHAT IS YOUR PREVIOUS EXPERIENCE IN THE PREPARATION OF CLASS COST OF SERVICE STUDIES?

A. I have prepared or supervised the preparation of cost studies on behalf of Public Counsel for over 13 years. These include class cost of service studies related to natural gas, water and electric utilities, and cost studies related to telecommunications services.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my direct testimony is to present Public Counsel's production cost allocators. I provided these allocators to OPC witness Ryan Kind for use in OPC Class Cost of Service studies. The first is a traditional method of allocating production costs based on a weighting of average and peak demands. The second offers an alternative production allocator based on Time of Use (TOU), similar to the TOU Demand allocators I filed in KCP&L Case No. ER-2006-0314 and Case No. ER-2009-0089 and in Ameren Case No. ER-2007-0002 and Case No. ER-2008-0318.

Q. WHICH CUSTOMER CLASSES ARE USED IN DEVELOPING YOUR PRODUCTION ALLOCATORS?

A. Both allocators are designed to apportion costs to a Residential Class (RG), a Small General Service Class (SGS), a blended Large General Service and Small Power Service Class (LGS/SPS), a Large Power Service Class (LPS) and a Large Transmission Class (LTS).

Q. ON WHAT DATA ARE YOUR ALLOCATORS BASED?

A. My allocators are based primarily on data provided by the Company and Staff including data related to investments and class and system peak demands and energy use.

Q. WHAT COSTS ARE INCLUDED IN PRODUCTION PLANT?

A. Production Plant includes the cost of land, structures and equipment used in connection with power generation.

Q. WHAT CONSIDERATIONS ARE IMPORTANT IN DEVELOPING ALLOCATORS TO APPORTION PRODUCTION PLANT COSTS?

A. Both demand and energy characteristics of a system's load are important determinants of production plant costs since production must satisfy both periods of normal use throughout the year and intermittent peak use.

Q. HOW DO YOUR ALLOCATORS REFLECT THESE USE CHARACTERISTICS?

A. One of my production allocators assigns Production Plant according to a composite allocator that has (1) a peak demand related component and (2) an energy related component. This method reflects peak demand using a 4 coincident peak component which is the average of the four highest system use hours. The method reflects normal use throughout the year using a measure of average energy use. For each customer class I develop a weighted allocator that includes the customer class's share of peak use (4CP) and average energy use. The weighting I used for the average energy component is called the "load factor" which is the proportion of average system use to total system use. One minus the load factor is the proportion of total system use associated with the remaining system peaking capacity so I used this as the weight assigned to peak use.

The alternative allocation method for Production Plant that I developed is a Time of Use method which assigns production investment to each hour of the year that the specific production occurs. The method then sums each class's share of hourly investments based on those hours when the class actually uses the system. This method involves examining the production and demand for each hour of the year so it reflects both peak period use and the average of use throughout the year.

Q. REGARDING YOUR FIRST ALLOCATION METHOD, IS A WEIGHTED AVERAGE AND COINCIDENT PEAK (A&CP) METHOD THAT ALLOWS DISCRETION IN SELECTION OF THE NUMBER OF COINCIDENT PEAKS AMONG THE NARUC-RECOGNIZED PRODUCTION CAPACITY COST ALLOCATION METHODS?

A. Yes. Part IV B. of the NARUC Electric Utility Cost Allocation Manual describes methods for developing energy weighted production plant cost allocations. Section 4 of Part IV discusses production cost allocations based on judgmental energy weightings. Page 57-59 of the NARUC Manual specifically recognizes weighted average and coincident peak methods where the coincident peak (CP) may be estimated based on more than one period of peak use. The Manual describes the method as follows:

> Some regulatory commissions, recognizing that energy loads are an important determinant of production plant costs, require the incorporation of judgmentally-established energy weightings into

> cost studies. One example is the "peak and average demand" allocator derived by adding together each class's contribution to the system peak demand (or to a specific group of system peak demands; e.g., the 12 monthly CPs) and its average demand. The allocator is effectively the average of the two numbers: class CP (however measured) and class average demand. Two variants of this allocation method are shown in Tables 4-14 and 4-15.

The Manual goes on to provide two examples of weighted methods, one based on average demand and a single period of coincident peak use (A&1CP) and another that incorporates average demand and 12 periods of peak use (A&12CP) in developing an allocator. I have included a copy of the relevant pages in Schedule 1 to this testimony.

I used an A&4CP method in calculating the production allocator. The 4CP I used to represent the peak portion of the allocator falls well within the number of peak periods recognized in the NARUC Manual. Also, as I described above, I used a measure of load factor (LF) as the weight assigned to the average portion of the allocator and used 1- LF as the weight assigned to the peak portion of the allocator. This is a common method of assigning weights used in the NARUC Manual.

Q. IS A 4CP REPRESENTATIVE OF THE PEAK DEMAND ON AMERENUE'S SYSTEM?

A. Yes. The 4CP is reasonably representative of the peak demand on AmerenUE's system. As illustrated in Table 1 the 4CP includes periods when demand was at or in excess of 85% of the system's maximum peak.

Table 1

Coincident Peak (CP) @ Generation (Converterd to MWh)

	Residential	SGS	LGS & SPS	LPS	LTS	Lighting	Total	% System Peak
Jan-09	3202	685	1995	472	480	17	6850	83%
Feb-09	2902	651	1891	470	482	5	6400	78%
Mar-09	2466	593	1786	463	481	0	5788	70%
Apr-08	1788	489	1758	484	479	0	4997	61%
May-08	2349	678	1959	578	480	0	6043	73%
Jun-08	3177	797	2244	613	484	0	7315	89%
Jul-08	3746	845	2298	620	480	0	7988	97%
Aug-08	3986	856	2279	629	479	0	8228	100%
Sep-08	2994	890	2175	623	482	0	7165	87%
Oct-08	1776	474	1786	495	471	23	5025	61%
Nov-08	2235	544	1801	509	465	0	5554	68%
Dec-08	3694	567	1540	407	483	59	6749	82%

Q. WHY IS IT REASONABLE TO USE MULTIPLE PEAKS IN DEVELOPING THE MEASURE OF COINCIDENT PEAK USED IN THE PRODUCTION CAPACITY ALLOCATOR?

A. As illustrated in Table 2, a class's relative share of system demand may vary significantly within a particular peak hour. Using a blended measure of the customer classes' relative share of system demand which occur during peak hours reduces the likelihood of relying on anomalous class characteristics of demand during a single peak hour as the basis of the allocator. In addition, the system is designed to meet a range of system demands and a class's relative share may vary over the period when the system peak might occur. For example, a customer class's peak demand requirements may vary by month. For these reasons, it is reasonable to consider relative class demand in more than simply the highest single peak hour to reflect the class's relative share of system demand. For each of the 4 hours used to develop the peak component of my A&4CP allocator the system demand is 87% or more of the annual system peak hour demand. Considering relative class demand in these hours when system demand exceeds 87% of the annual system peak hour demand retains the conceptual focus on determining peak demand while also reflecting each class's relative share of variation in system peak demands.

Table 2

Coincident Peak (CP) @ Generation (Converterd to MWh)

	Residential	SGS	LGS & SPS	LPS	LTS	Lighting
Jun-08	43.43%	10.90%	30.68%	8.38%	6.61%	0.00%
Jul-08	46.90%	10.58%	28.76%	7.76%	6.00%	0.00%
Aug-08	48.44%	10.40%	27.70%	7.64%	5.82%	0.00%
Sep-08	41.79%	12.43%	30.36%	8.70%	6.73%	0.00%

Q. PLEASE REVIEW YOUR SECOND PRODUCTION COST ALLOCATION METHOD.

A. The Time of Use method assigns production costs to each hour of the year that the specific production occurs. The method then sums each class' share of hourly investments based on only those hours when the class actually uses the system.

Q. DO YOU BELIEVE YOUR TIME OF USE METHOD IS CONSISTENT WITH THE METHOD DESCRIBED BY NARUC IN ITS 1992 ELECTRIC COST MANUAL?

A. Yes it is. The following is a description method from the NARUC manual which is consistent with the method I used to develop the time of use allocation.

> 4. Probability of Dispatch Method
>
> The probability of dispatch (POD) method is primarily a tool for analyzing cost of service by time periods. The method requires analyzing an actual or estimated hourly load curve for the utility and identifying the generating units that would normally be used to serve each hourly load. The annual revenue requirement of each generating unit is divided by the number of hours in the year that it operates, and that "per hour cost" is assigned to each hour that it runs. In allocating production plant costs to classes, the total cost for all units for each hour is allocated to the classes according to the KWH use in each hour. The total production plant cost allocated to each class is then obtained by summing the hourly cost over all hours of the year. These costs may then be recovered via an

> appropriate combination of demand and energy charges. It must be noted that this method has substantial input data and analysis requirements that may make it prohibitively expensive for utilities that do not develop and maintain the required data.

Q. WHAT METHOD DID PUBLIC COUNSEL RELY ON TO MODEL THE PROBABILITY OF DISPATCH?

A. Public Counsel relied on the RealTime model developed by The Emelar Group. The RealTime model simulates generation dispatch to satisfy load requirements for each hour of the year based on generation plant characteristics.

Q. WHAT IS YOUR EXPERIENCE WITH THE REALTIME MODEL?

A. I have worked with Michael Rahrer of The Emelar Group and the RealTime model in a number of electric rate cases since June 2006. In 2006, Public Counsel originally contracted with The Emelar Group to lease the RealTime model, to receive training on the use of the model and for enhancements to be made to the model that would generate reports and files that would allow Public Counsel to develop a production capacity cost allocator for use in class cost of service studies. For this case, Public Counsel contracted with Michael Rahrer to assist in running the RealTime model using primarily the input files prepared by the Staff for the Staff's RealTime fuel cost run.

Q. WHAT TYPES OF INFORMATION ARE USED AS INPUTS INTO THE REALTIME™ MODEL?

A. The inputs into the RealTime™ model include characteristics of system load and generation facilities, parameters related to operations and maintenance, fuel sources, historic fuel expenses and historic market prices.

Q. WHAT MODIFICATIONS DID PUBLIC COUNSEL MAKE TO THE STAFF'S INPUTS FOR THE REALTIME MODEL RUN?

A. The Staff's inputs included only aggregate load data. I developed disaggregated customer class load data based on information provided in the Company's workpapers. This modification has no substantive impact on the model results but facilitates a matching between hourly MW generation by plant and hourly demand by customer class. Public Counsel's second modification was to conduct runs of the model using a model function that conducts off-system sales when production is not constrained and the revenue generated from a non-firm off-system sale exceeds the cost of the sale.

Q. HOW DID YOU SPREAD THE INVESTMENT COSTS OF THE GENERATING UNITS THAT WOULD NORMALLY BE USED TO SERVE EACH HOURLY LOAD?

A. I used Staff accounting information on net generation plant investments to determine a cost per MW for each plant. I then spread the plant investment cost to each hour by multiplying the per plant cost per MW by the per plant MW production and summing for all plants in operation during the particular hour.

Q. HOW DID YOU THEN ALLOCATE THESE INVESTMENTS TO THE CUSTOMER CLASSES?

A. Based on hourly customer load information I apportioned each hour's total production investment costs to the customer classes based on each class's share of demand during the hour. In the final steps I summed each class's hourly portion of investment costs to determine the class's share of total investment costs.

Q. DO YOU VIEW THE TIME OF USE METHOD AS SUPERIOR TO OTHER PRODUCTION COST ALLOCATION METHODS?

Yes. Since it assigns costs based on generation plant use for all hours of the year I believe it is superior to methods that allocate the total production cost based in large part on class demand in only a single or only a few peak hours of the year. Allocators that overly focus on use in only a few peak hours unfairly over-allocate costs to the residential and small general service class because the capacity costs actually vary by hour depending on the plants in use. The particular pattern of use by each class over different hours of the year appropriately leads to a difference in overall average cost by class.

Q. HOW MUCH DIFFERENCE DOES THE TIME OF USE METHOD MAKE IN ALLOCATING PRODUCTION COSTS TO CLASSES?

A. It makes a significant difference to allocate production costs by matching production plant use to customer demand on an hourly basis. Table 3 illustrates the difference between my more limited A&4CP allocator and the Time of Use allocator.

Table 3

	RES	**SGS**	**LGS & SPS**	**LPS**	**LTS**
Ave&4CP Allocator	40.69%	9.18%	31.71%	10.02%	10.31%
TOU	38.15%	10.33%	31.7%	10.5%	10.2%

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

4. Judgmental Energy Weightings

Some regulatory commissions, recognizing that energy loads are an important determinant of production plant costs, require the incorporation of judgmentally-established energy weighting into cost studies. One example is the "peak and average demand" allocator derived by adding together each class's contribution to the system peak demand (or to a specified group of system peak demands; e.g., the 12 monthly CPs) and its average demand. The allocator is effectively the average of the two numbers: class CP (however measured) and class average demand. Two variants of this allocation method are shown in Tables 4-14 and 4-15.

TABLE 4-14

CLASS ALLOCATION FACTORS AND ALLOCATED PRODUCTION PLANT REVENUE REQUIREMENT USING THE 1 CP AND AVERAGE DEMAND METHOD

Rate Class	Demand Allocation Factor - 1 CP MW (Percent)	Demand-Related Production Plant Revenue Requirement	Avg. Demand (Total MWH) Allocation Factor	Energy-Related Production Plant Revenue Requirement	Total Class Production Plant Revenue Requirement
DOM	34.84	233,869,251	30.96	120,512,062	354,381,313
LSMP	37.25	250,020,306	33.87	131,822,415	381,842,722
LP	24.63	165,313,703	31.21	121,450,476	286,764,179
AG&P	3.29	22,078,048	3.22	12,545,108	34,623,156
SL	0.00	0	0.74	2,864,631	2,864,631
TOTAL	100.00	671,281,308	100.00	389,194,692	$1,060,476,000

Notes: The portion of the production plant classified as demand-related is calculated by dividing the annual system peak demand by the sum of (a) the annual system peak demand, Table 4-3, column 2, plus (b) the average system demand for the test year, Table 4-10A, column 3. Thus, the percentage classified as demand-related is equal to 13591/(13591+7880), or 63.30 percent. The percentage classified as energy-related is calculated similarly by dividing the average demand by the sum of the system peak demand and the average system demand. For the example, this percentage is 36.70 percent.

Some columns may not add to indicated totals due to rounding.

Schedule 1

TABLE 4-15

CLASS ALLOCATION FACTORS AND ALLOCATED PRODUCTION PLANT REVENUE REQUIREMENT USING THE 12 CP AND AVERAGE DEMAND METHOD

Rate Class	Demand Allocation Factor - 12 CP MW (Percent)	Demand-Related Production Plant Revenue	Average Demand (Total MWH) Allocation Factor	Energy-Related Production Plant Revenue Requirement	Total Class Production Plant Revenue Requirement
DOM	32.09	198,081,400	30.96	137,226,133	335,307,533
LSMP	38.43	237,225,254	33.87	150,105,143	387,330,397
LP	26.71	164,899,110	31.21	138,294,697	303,193,807
AG&P	2.42	14,960,151	3.22	14,285,015	29,245,167
SL	0.35	2,137,164	0.74	3,261,933	5,399,097
TOTAL	100.00	617,303,080	100.00	443,172,920	$1,060,476,000

Notes: The portion of production plant classified as demand-related is calculated by dividing the annual system peak demand by the sum of the 12 monthly system coincident peaks (Table 4-3, column 4) by the sum of that value plus the system average demand (Table 4-10A, column 3). Thus, for example, the percentage classified as demand-related is equal to 10976/(10976+7880), or 58.21 percent. The percentage classified as energy-related is calculated similarly by dividing the average demand by the sum of the average demand and the average of the twelve monthly peak demands. For the example, 41.79 percent of production plant revenue requirements are classified as energy-related.

Another variant of the peak and average demand method bases the production plant cost allocators on the 12 monthly CPs and average demand, with 1/13th of production plant classified as energy-related and allocated on the basis of the classes' KWH use or average demand, and the remaining 12/13ths classified as demand-related. The resulting allocation factors and allocations of revenue responsibility are shown in Table 4-16 for the example data.

TABLE 4-16

CLASS ALLOCATION FACTORS AND ALLOCATED PRODUCTION PLANT REVENUE REQUIREMENT USING THE 12 CP AND 1/13TH WEIGHTED AVERAGE DEMAND METHOD

Rate	Demand Allocation Factor - 12 CP MW (Percent)	Demand-Related Production Plant Revenue Requirement	Average Demand (Total MWH) Allocation Factor	Energy-Related Production Plant Revenue Requirement	Total Class Production Plant Revenue Requirement
DOM	32.09	314,111,612	30.96	25,259,288	339,370,900
LSMP	38.43	376,184,775	33.87	27,629,934	403,814,709
LP	26.71	261,492,120	31.21	25,455,979	286,948,099
AG&P	2.42	23,723,364	3.22	2,629,450	26,352,815
SL	0.35	3,389,052	0.74	600,426	3,989,478
TOTAL	100.00	978,900,923	100.00	81,575,077	$1,060,476,000

Notes: Using this method, 12/13ths (92.31 percent) of production plant revenue requirement is classified as demand-related and allocated using the 12 CP allocation factor, and 1/13th (7.69 percent) is classified as energy-related and allocated on the basis of total energy consumption or average demand.

Some columns may not add to indicated totals due to rounding.

C. Time-Differentiated Embedded Cost of Service Methods

Time-differentiated cost of service methods allocate production plant costs to baseload and peak hours, and perhaps to intermediate hours. These cost of service methods can also be easily used to allocate production plant costs to classes without specifically identifying allocation to time periods. Methods discussed briefly here include production stacking methods, system planning approaches, the base-intermediate-peak method, the LOLP production cost method, and the probability of dispatch method.

1. Production Stacking Methods

Objective: The cost of service analyst can use production stacking methods to determine the amount of production plant costs to classify as energy-related and to determine appropriate cost allocations to on-peak and off-peak periods. The basic