Exhibit No.:	
Issues:	Weather Normalization
Witness:	Steven M. Wills
Sponsoring Party:	Union Electric Company
Type of Exhibit:	Direct Testimony
Case No.:	GR-2010-_____
Date Testimony Prepared:	June 11, 2010

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. GR-2010-_____

DIRECT TESTIMONY

OF

STEVEN M. WILLS

ON

BEHALF OF

UNION ELECTRIC COMPANY
d/b/a AmerenUE

St. Louis, Missouri
June, 2010

TABLE OF CONTENTS

I. INTRODUCTION 1

II. PURPOSE AND SUMMARY OF TESTIMONY 3

III. WEATHER NORMALIZATION OF TEST YEAR SALES 3

IV. CLASS DEMANDS 9

DIRECT TESTIMONY

OF

STEVEN M. WILLS

CASE NO. GR-2010-_____

I. INTRODUCTION

Q. Please state your name and business address.

A. Steven M. Wills, Ameren Services Company ("Ameren Services"), One Ameren Plaza, 1901 Chouteau Avenue, St. Louis, Missouri 63103.

Q. What is your position with Ameren Services?

A. I am the Managing Supervisor of Quantitative Analytics in the Corporate Planning Department.

Q. What is Ameren Services?

A. Ameren Services provides various corporate, administrative and technical support services for Ameren Corporation ("Ameren") and its affiliates, including Union Electric Company d/b/a AmerenUE ("Company" or "AmerenUE"). Part of that work is performing important analyses, including weather normalization of test year sales for rate proceedings, which is the subject of my direct testimony in this case.

Q. Please describe your educational background and employment experience.

A. I received a Bachelor of Music degree from the University of Missouri-Columbia in 1996. I subsequently earned a Master of Music degree from Rice University in 1998, then a Master of Business Administration ("M.B.A.") degree with an emphasis

in Economics from St. Louis University in 2002. While pursuing my M.B.A., I interned at Ameren Energy in the Pricing and Analysis Group. Following completion of my M.B.A. in May 2002, I was hired by Laclede Gas Company as a Senior Analyst in its Financial Services Department. In this role I assisted the Manager of Financial Services in coordinating all financial aspects of rate cases, regulatory filings, rating agency studies, and numerous other projects.

In June 2004, I joined Ameren Services as a Forecasting Specialist. In this role I developed forecasting models and systems that supported the Ameren operating companies' involvement in the Midwest Independent Transmission System Operator, Inc.'s Day 2 Energy Markets. In November 2005, I moved into the Corporate Analysis Department in Ameren Services, where I was responsible for performing load research activities, electric and gas sales forecasts, and assisting with weather normalization for rate cases. In January 2007, I accepted a role I briefly held with Ameren Energy Marketing Company as an Asset and Trading Optimization Specialist before returning to Ameren Services as a Senior Commercial Transactions Analyst in July 2007. I was subsequently promoted to my present position as the Managing Supervisor of the Quantitative Analytics group.

Q. What are your responsibilities in your current position?

A. In my current position, I supervise a group of employees with responsibility for short-term electric load forecasting, long-term electric and gas sales forecasting, load research, weather normalization, and various other analytical tasks.

II. PURPOSE AND SUMMARY OF TESTIMONY

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to describe the process AmerenUE used to weather normalize test year sales and present the results of the analysis.

Q. Please provide an overview of the results of the weather normalization analysis.

A. The test year weather was slightly warmer than normal. Therefore, test year sales were adjusted up by approximately 1.7% in total to reflect sales that would be expected to occur under normal weather conditions.

III. WEATHER NORMALIZATION OF TEST YEAR SALES

Q. Are the Company's sales dependent on weather conditions experienced in its service territory?

A. Yes. Weather is one of the most significant factors that can introduce short-term fluctuations in the sales made by the Company. This is primarily due to the large number of customers that heat their premises with gas furnaces. When winter weather is unusually cold, furnaces must work harder to keep buildings warm. This results in an increase in the Company's sales. Similarly if the winter is particularly mild, heating loads, and therefore gas sales, will decline from expected levels.

Q. What is weather normalization and why is it necessary?

A. Weather normalization is the process of determining the level of sales that the Company should be expected to make on an ongoing basis under normal weather conditions. When changing rates in a rate case, it is important to normalize sales for the impact of unusual weather. This is because the level of test year sales will become the

denominator in the development of new gas rates (cents/ccf). If the test year included weather-related decreases in sales that are not expected to persist from year to year, the denominator of the rate will be too small and the resulting rate will be too high. In this case, the Company would be expected to recover more than the revenue requirement determined in this case. Conversely, if the weather-related sales are higher than normal, the resultant rate will be too low for the Company to have a reasonable opportunity to recover its revenue requirement. Adjusting sales to a normal level will help develop a final rate that is most likely to permit the Company to collect its revenue requirement accurately.

Q. Please describe the process used to weather normalize gas sales.

A. The first step in the process is to develop a statistical relationship between monthly billed gas sales and a weather variable, which in this case is billing month heating degree days ("HDD"). After the relationship has been established, sales are adjusted for the difference between actual HDD and normal HDD to arrive at a normal level of sales that is representative of what is expected going forward.

Q. Please define the term "heating degree day".

A. A heating degree day is a measure of weather that is used to quantify the need for space heating equipment to be used. It is calculated on a daily basis by averaging the high and low observed temperatures and then subtracting the result from 65 degrees. Sixty-five degrees is used as the base in the HDD calculation because it is considered to be a mild temperature where most customers do not use heating equipment. As the temperature falls below 65, customers start to turn on their heaters. As the

temperature falls farther below 65, more heating equipment is utilized and more HDDs accumulate.

Q. What is a "billing month" HDD?

A. Heating degree days are typically accumulated over a period of time to indicate the amount of heating requirements during that period. When using this variable to predict gas sales, the period of time over which HDDs are accumulated must match the period of time over which customers are billed. Customers' meters are read on 21 billing cycles. This means that usage billed in one month, for example January, could have occurred almost entirely within the month of December for one group of customers (Billing Cycle 1) or almost entirely within January for another group of customers (Billing Cycle 21). To calculate degree days that reflect the usage on these bills, HDDs are calculated for the days between the meter readings for each billing cycle, then averaged. This way the HDDs are accumulated over the same time period that the sales being normalized took place.

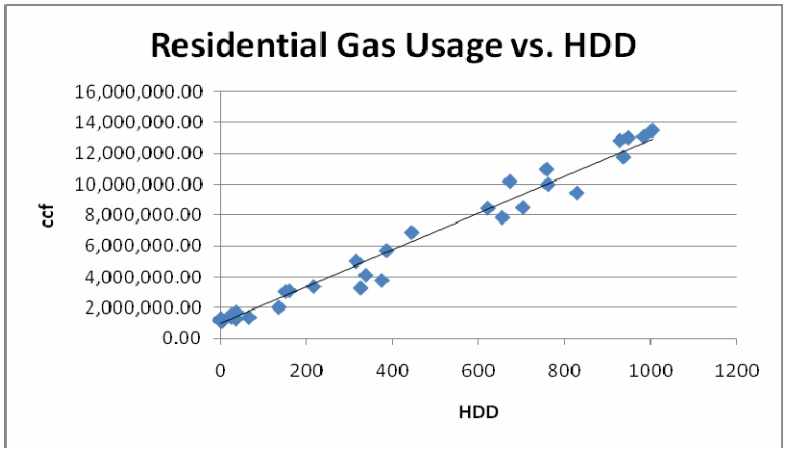
Q. What locations are HDDs calculated for?

A. HDDs are calculated for the cities of Columbia, Missouri and Cape Girardeau, Missouri. These locations are selected based on their proximity to the AmerenUE gas service territory. AmerenUE generally serves gas customers in two geographic areas of Missouri. The first area is typically referred to as the Southeast system, as it is in Southeastern Missouri, around Cape Girardeau. This system is served by the Texas Eastern Pipeline and the Natural Gas Pipeline. The other area is in central Missouri with significant load around Columbia. It is served by the Panhandle interstate pipeline. The former Aquila territory acquired by AmerenUE that includes the city of

Rolla has been grouped with the Panhandle system. The Aquila territory is very small relative to the rest of the Panhandle system and it is also in central Missouri, so should be reasonably represented by Columbia weather.

Q. Please describe the statistical models that establish the relationship between billing month HDDs and billed sales.

A. Regression models are used to establish this relationship. Regression is a statistical technique utilized to quantify the relationship between two or more variables. The dependent variable is the variable that the model is attempting to describe, in this case a measure of gas sales. The independent variables are the variables used to explain the behavior of the dependent variable. Regression seeks to predict the dependent variable based on observations of the independent variables. The statistical technique minimizes the sum of squared errors generated by the model, where the errors are the difference between the predicted values of the dependent variable and its observed values. In essence it can be most easily explained graphically. If a scatter plot is generated with the independent variable on one axis and a dependent variable on the other, the regression equation generates a line that best fits the data in the plot, as illustrated below:



Q. How were sales grouped for purposes of modeling?

A. The modeling was done by system and by rate class. As mentioned above, the AmerenUE gas system can be viewed in two pieces: the Southeast system and the Panhandle system. Each of these geographic areas was modeled separately. Also, each rate class was modeled separately. The rate classes include residential, general service, interruptible, standard transport and large transport. The sales utilized in the process were adjusted for the metering issue identified by Company witness James R. Pozzo.

Q. Please elaborate on the details of the modeling.

A. Models were constructed using data for the years 2007-2009. It is generally preferable to use the most data that is available and consistent. Three years of monthly data is sufficient to develop robust statistical models. The modeling was done in some cases on the basis of total usage, and in some cases on the basis of use per customer per day. Either method is appropriate. The use per customer per day models were utilized because this allowed them to be used also to generate class demand data for the class cost of service study where needed. All classes' sales were modeled as a linear function of HDDs, average billing days, customer counts, seasonal variables, and some interactions of the seasonal and HDD variables. These variables are sufficient to describe the way customers use gas. There are some end uses that fluctuate seasonally even beyond the impact of weather, such as water heating, gas fireplaces, cooking, etc. Additionally, the way space heating equipment is utilized may change seasonally, as some customers are slow to turn on furnaces in the fall and fast to turn them off in the spring. All of these effects are captured in these models.

Additionally, in a couple of cases, auto-regressive terms were employed. An auto-regressive term in a regression model is utilized when serial correlation is present. That simply means that the errors in the model's prediction have a discernable pattern. That pattern can be fed back into the model iteratively to help refine the relationship. This is necessary in particular right now because of the effects of the recession on the consumption of certain classes. The recession caused decreased usage across time over the past year and a half, which if not accounted for, would result in a trend in the residual (or error) pattern. The auto-regressive terms clean up this problem and allow the underlying weather relationships to be true.

Q. Were all classes determined to be weather sensitive?

A. No. Most classes were weather sensitive, but the Large Transport class on the Southeast system was not. It only consists of two customers and both are industrial in nature and not dependent on weather. All other classes were weather sensitive. Even the Large Transport class on the Panhandle system and the Interruptible class have some large hospitals and universities that use gas for heating purposes. In all cases but the one mentioned above, there are customers that would logically be expected to use gas for heating purposes, and as expected, the weather variables were clearly statistically significant.

Q. Once the models have been developed to describe the relationship of gas sales and weather, how are normalized sales determined?

A. The coefficients of the models can be interpreted as the incremental gas usage for each additional HDD. So it is just necessary to determine the difference between the observed HDDs and normal HDDs for each month. That difference is

multiplied by the appropriate coefficient to determine the appropriate weather adjustment to sales in each month.

Q. How are normal HDDs determined?

A. Consistent with past practices of the Company and the Missouri Public Service Commission Staff ("Staff"), the Company utilized the definition of normal weather that has been adopted by the National Oceanic and Atmospheric Administration ("NOAA"). NOAA defines normal for a climatic element as the arithmetic average of that element computed over three consecutive decades. The period from 1971-2000 is currently considered normal. The Company in fact used NOAA data for normal HDD for Columbia and Cape Girardeau in the normal calculation.

Q. After applying the weather adjustments, were any other adjustments made to sales?

A. Yes, I also calculated a days' adjustment. This adjustment is made to make sure that the sales in the test year represent 365 days of usage. Because of variability in the meter read schedule, an average customer can be billed for more or fewer days in any given year. Usage was adjusted by the ratio of 365 to the average number of days for which customers were billed.

Q. Please provide the results of the weather normalization analysis.

A. The results are attached as Schedule SMW-G1.

IV. CLASS DEMANDS

Q. Did you provide class demand data for the class cost of service study in this case?

A. Yes, I provided actual and weather normalized class demands to Company witness William M. Warwick.

Q. How were the class demands estimated?

A. For customers that had daily demand data available, that data was directly used. This data was available for all of the transportation classes. For those classes that only have monthly meter readings, I used the same models that developed the weather normalized sales to estimate class demands. I then compared the sum of the actual and estimated demands to the system sendout on the peak day and calibrated the estimates to match the system totals.

Q. Please describe the process of using the weather normalization models to estimate class demands.

A. The models were constructed on a use per customer per HDD basis. Therefore, the HDD from the peak day and customer count at that time could be utilized to directly calculate the estimated class demand. By multiplying the HDD from the peak day by the model's degree day coefficient, that day's use per customer results. That needs only to be multiplied by the customer count for that month to arrive at the estimated class demand.

Q. How were the results calibrated?

A. System sendout for the peak day is available. The estimated demands were summed and compared to the known system sendout, adjusted for lost and unaccounted for gas. To the extent that the class demands did not equal the system sendout, the difference was allocated back to the estimated classes based on the classes' load ratio share.

Q. Were the class demands subsequently weather normalized?

A. Yes, I also developed normalized demands.

Q. Please describe the normalization of the demands?

A. Similar to the normalization of sales, I just took the difference between normal HDD and actual HDD on the peak day of the year, and multiplied it by the appropriate model coefficients to determine the necessary adjustment to the class demands. Those adjustments were applied to the actual demands calculated as discussed above.

Q. What were the results of the class demand analysis?

A. The results can be found in Schedule SMW-G2 attached to my testimony.

Q. Does this conclude your direct testimony?

A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

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

AFFIDAVIT OF STEVEN M. WILLS

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

Steven M. Wills, being first duly sworn on his oath, states:

1. My name is Steven M. Wills. I work in the City of St. Louis, Missouri, and I am employed by Ameren Services Company as Managing Supervisor of Quantitative Analytics.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of Union Electric Company d/b/a AmerenUE consisting of 11 pages, Schedule SMW-G1 through SMW-G2, all of which have been prepared in written form for introduction into evidence in the above-referenced docket.

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

Steven M. Wills

Subscribed and sworn to before me this 11 day of June, 2010.

Amanda Tesdall
Notary Public

My commission expires:

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

Schedule SMW-G1: Actual vs. Normal Sales by Rate Class - 2009 (ccf)

		Residential		
Year	**Month**	***Actual***	***WN***	***% Change***
2009	1	15,485,759	15,548,480	0.405%
2009	2	13,975,353	14,156,225	1.294%
2009	3	10,029,378	10,943,970	9.119%
2009	4	6,618,756	6,421,990	-2.973%
2009	5	3,537,734	3,628,074	2.554%
2009	6	1,800,293	1,936,954	7.591%
2009	7	1,463,418	1,467,940	0.309%
2009	8	1,372,624	1,372,518	-0.008%
2009	9	1,429,485	1,458,395	2.022%
2009	10	2,372,248	1,968,932	-17.001%
2009	11	4,829,569	4,821,635	-0.164%
2009	12	9,327,869	10,180,039	9.136%
	Total	72,242,487	73,905,152	2.302%

		Small General		
Year	**Month**	***Actual***	***WN***	***% Change***
2009	1	2,240,421	2,253,258	0.573%
2009	2	1,998,819	2,016,439	0.881%
2009	3	1,327,880	1,433,716	7.970%
2009	4	775,754	755,251	-2.643%
2009	5	357,054	364,152	1.988%
2009	6	183,815	191,652	4.263%
2009	7	169,337	169,530	0.114%
2009	8	155,123	155,054	-0.044%
2009	9	164,636	166,165	0.929%
2009	10	252,932	224,567	-11.214%
2009	11	494,903	494,259	-0.130%
2009	12	1,214,133	1,304,917	7.477%
	Total	9,334,807	9,528,961	2.080%

		Large General		
Year	**Month**	***Actual***	***WN***	***% Change***
2009	1	5,459,295	5,481,759	0.411%
2009	2	4,994,410	5,050,258	1.118%
2009	3	3,644,815	3,938,016	8.044%
2009	4	2,513,964	2,445,571	-2.721%
2009	5	1,559,696	1,590,724	1.989%
2009	6	1,147,238	1,196,129	4.262%
2009	7	1,015,137	1,016,296	0.114%
2009	8	1,016,737	1,016,292	-0.044%
2009	9	1,099,396	1,109,667	0.934%
2009	10	1,398,503	1,243,355	-11.094%
2009	11	2,084,676	2,082,404	-0.109%
2009	12	3,465,655	3,726,580	7.529%
	Total	29,399,522	29,897,052	1.692%

		Industrial Interruptible		
Year	**Month**	***Actual***	***WN***	***% Change***
2009	1	579,958	585,299	0.921%
2009	2	498,175	496,252	-0.386%
2009	3	446,870	457,200	2.312%
2009	4	314,653	312,946	-0.542%
2009	5	430,863	430,540	-0.075%
2009	6	375,629	375,348	-0.075%
2009	7	318,157	317,919	-0.075%
2009	8	248,087	247,901	-0.075%
2009	9	439,698	439,369	-0.075%
2009	10	384,906	384,618	-0.075%
2009	11	450,057	449,594	-0.103%
2009	12	447,080	461,251	3.170%
	Total	4,934,133	4,958,236	0.488%

		Large Transport		
Year	**Month**	***Actual***	***WN***	***% Change***
2009	1	2,295,049	2,294,268	-0.034%
2009	2	2,352,699	2,369,136	0.699%
2009	3	1,938,940	1,988,802	2.572%
2009	4	1,900,111	1,878,855	-1.119%
2009	5	1,771,729	1,781,141	0.531%
2009	6	1,585,670	1,585,670	0.000%
2009	7	1,396,486	1,396,486	0.000%
2009	8	1,539,180	1,539,180	0.000%
2009	9	1,735,259	1,735,259	0.000%
2009	10	1,498,871	1,498,871	0.000%
2009	11	2,011,820	2,011,104	-0.036%
2009	12	1,955,291	1,992,814	1.919%
	Total	21,981,105	22,071,586	0.412%

		Standard Transport		
Year	**Month**	***Actual***	***WN***	***% Change***
2009	1	2,446,133	2,447,415	0.052%
2009	2	2,580,823	2,611,242	1.179%
2009	3	1,971,282	2,092,183	6.133%
2009	4	1,574,616	1,539,826	-2.209%
2009	5	1,298,336	1,319,486	1.629%
2009	6	883,620	884,557	0.106%
2009	7	837,840	837,843	0.000%
2009	8	830,656	830,656	0.000%
2009	9	870,338	870,606	0.031%
2009	10	887,304	884,589	-0.306%
2009	11	1,343,294	1,342,248	-0.078%
2009	12	1,417,700	1,488,528	4.996%
	Total	16,941,942	17,149,179	1.223%

		Total		
Year	**Month**	***Actual***	***WN***	***% Change***
2009	1	28,506,615	28,610,480	0.364%
2009	2	26,400,279	26,699,552	1.134%
2009	3	19,359,165	20,853,886	7.721%
2009	4	13,697,854	13,354,440	-2.507%
2009	5	8,955,412	9,114,118	1.772%
2009	6	5,976,265	6,170,309	3.247%
2009	7	5,200,375	5,206,014	0.108%
2009	8	5,162,407	5,161,602	-0.016%
2009	9	5,738,812	5,779,461	0.708%
2009	10	6,794,764	6,204,932	-8.681%
2009	11	11,214,319	11,201,244	-0.117%
2009	12	17,827,728	19,154,129	7.440%
	Total	154,833,996	157,510,166	1.728%

Schedule SMW-G2: Coincident peak (CP) and Non- coincident peak (NCP) by Rate Class (ccf)

		Peak Day	Residential	General	Industrial Interruptible	Large Transport	Standard Transport
Actual	**CP**	01/15/2009	871,127	412,169	***	101,060	113,102
	NCP		871,127	412,169	33,796	118,521	113,102
Normal	**CP**		910,127	429,652	***	102,626	117,054
	NCP		910,127	429,652	34,547	122,192	117,054

***CP set to zero to recognize potential interruption on peak day.