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Missouri Public
Service Commission

Missouri Industrial Energy
Consumers
Legal Department
500 Madison Street
Jefferson City, MO 65101

Not at this address

1st NOTICE
2nd NOTICE
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BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In Re: Union Electric Company's 2008 Utility Resource Filing Pursuant to 4 CSR 240- Chapter 22	)))	**Case No. EO-2007-0409**

ORDER CORRECTING ORDER GRANTING AMERENUE'S REQUEST FOR WAIVERS

Issue Date: May 10, 2007 Effective Date: May 10, 2007

On May 10, 2007, the Commission issued an order that granted AmerenUE's request for waivers from certain provisions of the Commission's Integrated Resource Planning rule, 4 CSR 240-22. AmerenUE's application requested specific waivers described in Attachments A, B, C, and D to its application. The Commission intended to grant all requested waivers, but its order inadvertently referred only to attachment A. The order will be corrected to clarify that all requested waivers are granted.

IT IS ORDERED THAT:

1. Union Electric Company d/b/a AmerenUE's request for waivers from certain portions of the Commission's Integrated Resource Planning rules is granted. The specific portions of the rule that are waived are described in Attachments A, B, C, and D, attached to this order.

2. This order shall become effective on May 10, 2007.

BY THE COMMISSION

Colleen M. Dale
Secretary

(S E A L)

Morris L. Woodruff, Deputy Chief Regulatory Law Judge, by delegation of authority pursuant to Section 386.240, RSMo 2000.

Dated at Jefferson City, Missouri, on this 10th day of May, 2007.

ATTACHMENT A

WAIVER REQUESTS RELATED TO LOAD ANALYSIS AND FORECASTING 4 CSR 240-22.030

I. BACKGROUND

As part of the long-term forecast filing, AmerenUE is required to satisfy very specific rules as outlined in the Missouri Electric Utility Resource Planning 4CSR-240-22.030 Load Analysis and Forecasting rule. This rule was established in 1993 when end-use forecasting was generally regarded as the best approach for generating long-term forecasts. Since that time, the long-term forecast methodology at AmerenUE has evolved to a less data intensive statistical modeling approach called a Statistically Adjusted End-Use (SAE) model. AmerenUE proposes to continue to use the SAE modeling methodology, which has become the industry standard forecasting approach, for the upcoming 2008 IRP filing.

Transition from End-Use to SAE-Based Models

The end-use framework builds up an annual energy forecast from individual end-use forecasts. This often entails forecasting demand for over a dozen end-uses for multiple market segments. This may include three to four residential sectors (e.g., single-family, multi-family, and mobile homes) and eight to twelve commercial segments (e.g., office, retail, hospitals, and grocery stores). The estimation process involves constructing detail appliance characteristic data for each end-use and market segment where characteristic data includes:

- End-use base-year annual usage (existing and new construction)
- Appliance age distribution
- Average efficiency for each age segment
- Appliance costs
- Appliance size
- Fuel availability
- New appliance options and associated efficiency
- Thermal shell characteristics both new and existing homes and buildings

An end-use forecast is generated by forecasting energy requirements by sector and end-use then aggregating the results to a total class energy forecast. The process requires forecasting the number of appliances, change in operating costs, changes in size, change in efficiency, and change in stock utilization.

For many years, Itron (formerly Regional Economic Research, Inc.) maintained and implemented the EPRI end-use models REEPS (Residential), COMMEND (commercial), and INFORM (industrial). Through the early 1990's these models represented the best of practice in long-term energy forecasting.

The popularity of the end-use models for long-term energy forecasts declined through the 1990's and into the current period largely as a result of the high cost of implementing and maintaining end-use models. Data development and modeling work often cost several hundred thousand dollars every three to four years. It was not unusual for a utility to have large forecast staffs that could allocate a full man-year to maintaining an individual end-use model. Cost pressures and staffing reductions required utilities to implement a less costly approach for generating long-term energy forecasts. To this end, Itron developed the SAE model in response to forecasters' request for an approach that still captures end-use saturation and efficiency trends but is less costly to maintain and is easier to use.

The SAE modeling methodology currently represents the best of practice for long-term forecasting and has been successfully used and approved in numerous regulatory filings before state public utilities commissions that include Florida, Ohio, New York, Pennsylvania, Vermont, Colorado..

SAE Modeling Approach

To provide context for the waiver requests an overview of the proposed forecasting methodology is presented below.

Estimating Class Energy Requirements

Residential sales will be based on an estimated Statistically Adjusted End-Use (SAE) model specification. An SAE modeling approach entails constructing end-use variables that include end-use saturation and efficiency trends as well as economic, price, and weather impacts. The SAE specification allows us to directly capture the impact of improving end-use efficiency and end-use saturation trends on class sales. The process entails constructing end-use variables (i.e., XHeat, XCool, and XOther) and using these variables in estimated average use regression models as shown below:

$$AvgUse_m = a + b_1 \times XHeat_m + b_2 \times XCool_m + b_3 \times XOther_m + \varepsilon_m$$

The objective is to construct generalized end-use variables that approximate monthly end-use kWh requirements. The constructed end-use variables have two components – an index variable that captures change in end-use saturation, stock efficiency, and improvements in thermal shell integrity (e.g., *HeatIndex*), and a variable that reflects short-term utilization of this stock (e.g., *HeatUse*). The end-use variable (e.g., *XHeat*) is constructed as the product of these two components. XHeat, for example, is calculated as:

$$XHeat_{y,m} = HeatIndex_y \times HeatUse_{y,m}$$

where:

$$HeatUse_{y,m} = \left(\frac{HDD_{y,m}}{HDD_{01}}\right) \times \left(\frac{HHSize_y}{HHSize_{01}}\right)^{0.20} \times \left(\frac{Income_y}{Income_{01}}\right)^{0.20} \times \left(\frac{Price_{y,m}}{Price_{01}}\right)^{-0.15}$$

The economic and price drivers are incorporated into the HeatUse variable. By construction, the $HeatUse_{y,m}$ variable is close to one in the base year (2001). This index value changes through time and across months in response to changes in weather conditions, prices, household size, and household income. The heat index (HeatIndex) is a variable that captures heating end-use efficiency and saturation trends, thermal shell improvement trends, and housing square footage trends. The index is constructed from the EIA annual end-use residential forecast for the West North Central census region.

The heat index (HeatIndex) and heat use variable (HeatUse) are combined to generate the monthly heating variable XHeat. Figure 1 in the Attachment shows the calculated XHeat variable for the residential heating customer class.

The constructed XHeat variable is an estimate of monthly heating requirement (kWh). Similar variables are constructed for cooling (*XCool*) and other end-uses (*XOther*). Figure 2 and Figure 3 show XCool and XOther. The monthly variation in the XOther variable is driven by variation in the number of billing days, lighting requirements, and electricity usage for water heating.

The end-use variables are used to estimate an average use model for residential class. The end-use variables are statistically adjusted to fit actual observed average kWh usage – thus the name Statistically Adjusted End-Use Model.

Figure 4 shows actual and predicted average use for a residential SAE average use model.

In general, the SAE models perform extremely well with an Adjusted R^2 above 0.95 and average absolute percent errors (MAPE) of less than three percent. One of the benefits of the SAE model is that it has proven to be accurate for short-term monthly forecasts for financial planning as well as provide reasonable long-term forecasts for capacity planning purposes.

The SAE model specification will also be used for developing commercial sales forecasts for the small general service and large general service rate classes. For these classes, the general approach is to construct total monthly sales models where the end-use variables reflect class total end-use energy requirements. Figure 5 shows a commercial SAE-based sales forecast. The commercial SAE models also generally perform well with an adjusted R^2 above 0.9 and MAPE's of less than three percent.

Using the set of estimated model coefficients, it's possible to provide end-use sales estimates for the primary end-uses – cooling, heating, and all other uses. Figure 6 shows the end-use decomposition for the residential sector.

Forecasting System Hourly Load and Peak Demand

Hourly load and system peak demand will be based on a load build-up forecasting model. The build-up approach entails combining customer class energy forecasts with class hourly load profiles; this generates an 8760 hourly load forecast for each major customer class. For residential sector, the availability of reasonable end-use hourly load data for heating, cooling, and other use allows us to construct hourly load forecasts for these end-use classifications and aggregate up to a total residential hourly load forecast. Representative hourly load profiles for residential heating, cooling and other use have been developed by Itron for Missouri. Hourly load profiles are based on building simulation models using Saint Louis weather conditions. Figure 7 shows resulting residential hourly load forecast.

The class hourly load forecasts are aggregated to yield a system hourly load forecast. From the hourly load forecast we can then extract annual and monthly system peak and class coincident peak demands. Figure 8 shows the add-up of class hourly loads to a system hourly load forecast.

The primary benefit of the build-up modeling approach is that it allows us to capture the impact differences of end-use sales growth (in the residential sector) and class energy growth has on system hourly load and system peak as the contribution to system peak can be quite different across sectors.

Load Analysis Data Requirements

4 CSR 240-22.050(4) requires an estimate of the technical potential for energy savings and demand reductions for measures passing an initial cost-effectiveness screen. AmerenUE and its Demand Side Management (DSM) consultant, ICF International (ICF), have proposed a waiver of this requirement, given that such an estimate plays no role in the subsequent analysis

of DSM programs. The rule does not require an estimate of either economic or achievable DSM potential. However, AmerenUE and ICF have proposed to prepare an estimate of achievable potential for DSM based on the DSM programs that are to be considered in the integration analysis. This analysis of achievable potential does not require that historical or forecasted energy use and demand be disaggregated by end use and, therefore, detailed end-use data are not needed for DSM analysis for 2008 filing.

The analysis of achievable potential will require end use load shapes. However, ICF has explained that these shapes can be obtained from other sources and does not need end-use information from AmerenUE's Load Analysis group. Non-weather-sensitive load shapes will be obtained from ITRON. Weather-sensitive load shapes will be developed using DOE-2 building energy simulation modeling of prototypical buildings and weather data for the AmerenUE service territory.

AmerenUE's 2008 IRP implementation plan will outline its DSM Process and data needs for the next three years (2008-2011).

In summary, AmerenUE is requesting several waivers from the forecast rules due to the change in forecast methodology (end-use model to SAE modeling approach) as these rules relate to end-use forecasting, and waivers related to some of the load analysis rules as these requirements are not needed to support the current DSM planning activity as explained above.

II. WAIVER REQUESTS

(1) 4 CSR 240-22.030 (1)(D) 1

Current Requirement:
The development of actual and weather-normalized monthly class and system energy usage and actual hourly net system loads shall start from January 1982 or for the period of time used as the basis of the utility's forecast, whichever is longer.

Proposed Alternative:
AmerenUE will develop actual and weather-normalized monthly class and system energy usage and actual hourly net system loads that will give sufficient degrees of freedom in forecast models.

Rationale:
Consistent rate class level sales data is not available back to January 1982. Consistent rate class sales data is available back to January 1995. This represents more than ten years of monthly sales data – more than enough data to estimate rigorous forecast models. Sales data back to January 1995 will be used.

Actual hourly net system load data specific to AmerenUE's current service territory is available back to 2001; hourly system data going back to 1982 is available but will not be used in forecasting or DSM analysis as it includes Metro East (Illinois) and wholesale loads, which cannot be reasonably separated. AmerenUE system hourly load data from January 2001 through December 2006 will be used.

The weather normalization methodology of energy has significantly changed over the last twenty years. As a result any available historical weather normalized system and class energy is inconsistent across time. As an alternative, AmerenUE will provide historical monthly weather normal energy estimates for the last ten years based on the most current weather response models and normal weather conditions. As part of the weather-normalization process, AmerenUE will explore both use of daily weather response functions and monthly rate class models. Models and resulting estimates will be provided.

(2) 4 CSR 240-22.030 (1) (D) 2

Current Requirement:
Estimated actual and weather-normalized class and system monthly demands at the time of the system peak and weather normalized hourly system loads shall start from January 1990 or for the period of time used as the basis of the utility's forecast of these loads, whichever is longer.

Proposed Alternative:
Estimated actual and weather-normalized class and system monthly demands at the time of the system peak and weather normalized hourly system loads for the most recent three years or for the period of time used as the basis of the utility's forecast of these loads, whichever is longer.

Rationale:
Historical monthly class coincident demands (actual and weather normalized) back to 1990 are not available. As an alternative, AmerenUE has major class estimates of coincident monthly peak demand for actual and normal weather conditions back to July 2003, as prior to that load research sample included Metro East. The rules were written

in 1993 implying the need for three years of such data. Estimates will be based on the class and system hourly profile models using data beginning July 2003.

(3) **4 CSR 240-22.030 (3)**

Current Requirement:
Analysis of Use Per Unit. For each major class, the utility shall analyze historical use per unit by end use.

Proposed Alternative:
Analysis of Use Per Unit. For each major class, AmerenUE will analyze historical use per unit.

Rationale:
AmerenUE does not have an accurate means of disaggregating sales data by end-use and that data are not required for forecasting or DSM analysis for the 2008 filing. Historical data for use per customer will be provided and if there are any significant changes in trends, the reasons will be noted.

For more detailed explanation, please refer to Section 1.

(4) **4 CSR 240-22.030 (3) (A) 1**

Current Requirement:
Where applicable for each major class, end-use information shall be developed for at least lighting, process equipment, space cooling, space heating, water heating, and refrigeration.

Proposed Alternative:
For residential, commercial SGS and commercial LGS classes, 'heating, cooling, and other' uses will be estimated.

Rationale:
Aggregate end-use usage will be estimated using SAE models for heating, cooling, and other uses for the residential, commercial SGS and commercial LGS classes. AmerenUE does not have an accurate means of further disaggregating "other use" to end-uses like lighting, water heating, or refrigeration. Process equipment load is generally associated with the industrial sector. The available data does not support constructing SAE models for the industrial and other classes. As a result end-use estimates including process equipment load will not be available for these classes.

For more detailed explanation, please refer to Section 1.

(5) **4 CSR 240-22.030 (3) (A) 2**

Current Requirement:
For each major class and each end use, including those listed in paragraph (3) (A) 1., if information is not available, the utility shall provide a schedule for acquiring this end-use information or demonstrate that either the expected costs of acquisition were found to outweigh the expected benefits over the planning horizon or that gathering the end-use information has proven to be infeasible.

Proposed Alternative:
AmerenUE is requesting a complete waiver from the requirement of section 4 CSR 240-22.030 (3) (A) 2.

Rationale:
Utility-specific survey information will not be available at the time of the 2008 filing. For this forecast AmerenUE will utilize the Missouri Statewide Residential Lighting and Appliance Saturation and Efficiency Study that was completed by RLW Analytics in 2006 and end-use data for the West North Central census region developed by the Energy Information Administration. AmerenUE will evaluate implementing utility-specific residential and commercial surveys going forward on a three-year basis. To control costs, AmerenUE will explore the possibility of conducting joint surveys with other Missouri utilities and assess the viability of jointly funding additional state-wide studies.

(6) **4 CSR 240-22.030 (3) (A) 4**

Current Requirement:
The difference between the total load of a major class and all end uses for which the utility has acquired end-use information shall be designated as an end use for that major class.

Proposed Alternative:
AmerenUE is requesting a complete waiver from the requirement of section 4 CSR 240-22.030 (3) (A) 4.

Rationale:
AmerenUE is not using a bottom-up end-use forecasting approach as envisioned by the rule and the data that would support such methodology are not collected; therefore there is no foundation to comply with this rule. Total sales data for each rate and revenue class are available, and for residential and smaller commercial classes, using the SAE methodology, heating, cooling loads will be determined and the remaining sales will be designated as "other" class.

For more detailed explanation, please refer to Section 1.

(7) 4 CSR 240-22.030 (3) (B) 1

Current Requirement:
Measures of the stock of energy-using capital goods. For each major class and end use, the utility shall implement a procedure to develop and maintain survey data on the energy-related characteristics of the building, appliance, and equipment stock including saturation levels, efficiency levels, and sizes where applicable. The utility shall update these surveys before each scheduled filing pursuant to 4 CSR 240-22.080.

Proposed Alternative:
AmerenUE is requesting a complete waiver from the requirement of section 4 CSR 240-22.030 (3) (B) 1.

Rationale:
Same as (3) (A) 2 above. Utility-specific survey information will not be available at the time of the 2008 filing. For this forecast AmerenUE will utilize the Missouri Statewide Residential Lighting and Appliance Saturation and Efficiency Study conducted by RLW Analytics and end-use data for the West North Central census region developed by the Energy Information Administration. AmerenUE will evaluate implementing utility-specific residential and commercial surveys going forward on a three-year basis. To control costs, AmerenUE will explore the possibility of conducting joint surveys with other Missouri utilities and assess the viability of jointly funding additional state-wide appliance saturation studies.

(8) 4 CSR 240-22.030 (3) (B) 2

Current Requirement:
Estimate of end-use energy and demand. For each end use, the utility shall estimate end-use monthly energies and demands at time of the monthly system peaks and shall calibrate these energies and demands to equal the weather-normalized monthly energies and demands at the time of monthly peaks for each major class for the most recently available data.

Proposed Alternative:
AmerenUE will estimate major class actual and weather normalized monthly energies and demands at the time of the monthly system peaks for the most recently available data. Where information is available for a major class, AmerenUE will disaggregate the monthly energies and demands at the time of monthly system peaks into heating, cooling and other uses.

Rationale:
Monthly end-use sales and coincident demands are not available. As part of the modeling process, however, AmerenUE will provide monthly energy and system coincident demand estimates for the primary rate and revenue classes. . Data will be provided for actual weather and normal weather conditions. Detail end-use data is not available for residential, commercial, industrial, and other sectors. However, using the SAE modeling approach, monthly energies for residential, commercial SGS and commercial LGS will be estimated by heating, cooling and other uses. Also, residential class demands at the time of monthly system peaks will be broken into heating, cooling and other uses.

For more detailed explanation, please refer to Section 1.

(9) 4 CSR 240-22.030 (4) (A)

Current Requirement:
Load profiles for each day type shall be developed for each end use, for each major class and for the net system load.

Proposed Alternative:
Load profiles for each day type shall be developed for each major class and for the net system load. Where information is available for a major class, load profiles for heating, cooling and other uses will also be estimated.

Rationale:
Detail end-use profile data is not available for any of the classes; only heating, cooling and other use profiles for residential class are available. AmerenUE will provide load profiles as specified for the major classes, the net system load and aggregate residential end-use load estimates for heating, cooling, and other uses. For more detailed explanation, please refer to Section 1.

(10) 4 CSR 240-22.030 (4) (B)

Current Requirement:
For each day type, the estimated end-use load profiles shall be calibrated to sum to the estimated major class load profiles and the estimated major class load profiles and the estimated major class load profiles shall be calibrated to sum to the net system load profiles.

Proposed Alternative:
For each day type, the estimated major class load profiles shall be calibrated to sum to the net system load profiles. Where information is available and heating, cooling and other

uses are estimated for a major class, these profiles will be calibrated to sum to the estimated major class load profiles.

Rationale:
Detail end-use profile data is not available for any of the classes; only heating, cooling and other use profiles for residential class are available. Aggregate residential end-use profiles for heating, cooling, and other use will be calibrated to the residential hourly load profile, and major class profiles will be calibrated to net system hourly loads.
For more detailed explanation, please refer to Section 1.

(11) 4 CSR 240-22.030 (5) (B) 2.A

Current Requirement:
The forecasts of the driver variables for the use per unit shall be specified. The utility shall document how the forecast of use per unit has taken into account the effects of real prices of electricity, real prices of competitive energy sources, real incomes and other relevant economic and demographic factors.

Proposed Alternative:
The forecasts of the driver variables used in the utility's sales and customer forecast models shall be specified. AmerenUE will perform the residential analysis on a use per unit and the non-residential analyses on a total monthly class kWh basis. AmerenUE will document how the forecast has taken into account the effects of real prices of electricity, real prices of competitive energy sources, real incomes and other relevant economic and demographic factors.

Rationale:
Commercial and industrial customer class sales will be forecasted on a total sales basis as these classes are not as homogenous and using average use models (per unit models) would not improve the forecast. Analyses will be provided on a monthly class kWh basis for the non-residential rate and revenue classes. Residential analysis will be provided on a use per customer basis. Monthly historical sales data and forecast results for all classes will be reported on both a total kWh basis and use per customer basis. AmerenUE will document how the forecast has taken into account the effects of real prices of electricity, real prices of competitive energy sources, real incomes and other relevant economic and demographic factors.

(12) 4 CSR 240-22.030 (5) (B) 2.B

Current Requirement:
End-use detail. For each major class and for each end use, the utility shall forecast both monthly energy use and demands at time of the summer and winter system peaks.

Proposed Alternative:
For each major class, the utility shall forecast both monthly energy use and demands at time of the summer and winter system peaks. Where information is available for a major class, the utility shall provide forecasts of the monthly energy and demand at the time of summer and winter system peaks by heating, cooling and other uses.

Rationale:
SAE forecast models do not provide a means of extracting end-use forecasts. For those sectors where SAE is utilized (residential and small commercial customer classes) the SAE model specifications will allow AmerenUE to provide aggregate heating, cooling, and total "other use" sales forecasts. No end-use sales forecasts will be generated in the larger commercial, industrial, wholesales, or "other" customer classes. Heating, cooling and other use coincident demand forecasts will be provided for the residential sector and major class coincident peak demands for the commercial, industrial, wholesale, and "other" customer classes.

For more detailed explanation, please refer to Section 1.

(13) 4 CSR 240-22.030 (6)

Current Requirement:
The utility shall analyze the sensitivity of the component of the base-case forecast for each major class to variations in the key driver variables, including the real price of electricity, the real price of competing fuels and economic and demographic factors identified in section (2) and subparagraph (5)(B)2.A.

Proposed Alternative:
AmerenUE is requesting a complete waiver from the requirement of section 4 CSR 240-22.030 (6).

Rationale:
AmerenUE seeks a waiver from this requirement because its purpose is to provide a basis for the high and low load forecasts under (7), but this use would be made unnecessary under waiver request (7) below. The sensitivity analysis described in section (6) would be replaced by the development of a subjective probability distribution over load forecasts in the development of the probability tree of scenarios.

(14) 4 CSR 240-22.030 (7)

Current Requirement:
Based on the sensitivity analysis described in section (6), the utility shall produce at least two additional load forecasts (a high-growth case and a low-growth case) that bracket the base-case load forecast. Subjective probabilities shall be assigned to each of the load

forecast cases. These forecasts and associated subjective probabilities shall be used as inputs to the strategic risk analysis.

Proposed Alternative:
Based on the range of load forecasts that are reflected in the probability tree of scenarios, AmerenUE will select at least two (2) additional load forecasts (a high-growth case and a low-growth case) that bracket the base-case load forecast. Subjective probabilities shall be assigned to each of the load forecast cases in a manner that is consistent with their subjective probabilities as part of the probability tree. These forecasts and associated subjective probabilities shall be consistent with inputs to the strategic risk analysis required by 4 CSR 240-22.070."

Rationale:
This change will ensure that the uncertainty in load forecasts used in 4 CSR 240-22.030 will be completely consistent with the uncertainties on this same variable that will be used in the risk analysis and strategy selection steps of 4 CSR 240-22.070.

(15) 4 CSR 240-22.030 (8) (B) 2

Current Requirement:
The plots for the forecast period shall show each end-use component of major class coincident demands per unit and total class coincident demands for the base-case forecast.

Proposed Alternative:
The plots for the forecast period shall show each major class coincident demands per unit and total class coincident demands for the base-case forecast. Where heating, cooling and other uses are estimated for any major class, the utility shall provide the total and per unit coincident demands for the base-case forecast by these aggregate end-uses.

Rationale:
Detail end-use forecasts are not available as part of the proposed load modeling approach. AmerenUE will provide major class coincident demand forecasts on a total and per unit (customer) basis. Ameren will also provide residential heating, cooling, and "other use" coincident peak demand on a total and per customer basis.

For more detailed explanation, please refer to Section 1.

(16) 4 CSR 240-22.030 (8) (C)

Current Requirement:
For the forecast of class energy and peak demands, the utility shall provide a summary of the sensitivity analysis required by section (6) of this rule that shows how changes in the driver variables affect the forecast.

Proposed Alternative:
For the forecast of energy and peak demands, AmerenUE will provide a summary of the range of load forecasts that are reflected in the probability tree of scenarios and the subjective probabilities that are assigned to each of the load forecast cases based on their probabilities as part of the probability tree.

Rationale:
Since AmerenUE seeks a waiver from 4 CSR 240-22.030 (6) above, it proposes to replace the reporting for 4 CSR 240-22.030 (6) with reporting the range of load forecasts that are reflected in the probability tree of scenarios and the subjective probabilities.

(17) 4 CSR 240-22.030 (8) (E) 1

Current Requirement:
The plots shall show each end-use component of the hourly load profile.

Proposed Alternative:
Where heating, cooling and other uses are estimated for a major class, the plots shall show these aggregate end use components of the hourly load profile.

Rationale:
The proposed forecast methodology will not allow AmerenUE to generate detail end-use hourly loads. Load Analysis staff will however, be able to provide hourly residential end-use load profiles for heating, cooling, and "other uses". End-use load profiles defined at this level will be provided as part of the forecast documentation.

For more detailed explanation, please refer to Section 1.

ATTACHMENT

Figure 1: XHeat (kWh)

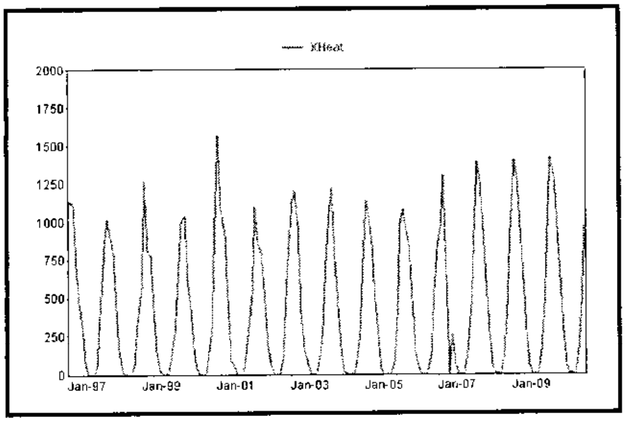


Figure 2: XCool (kWh)

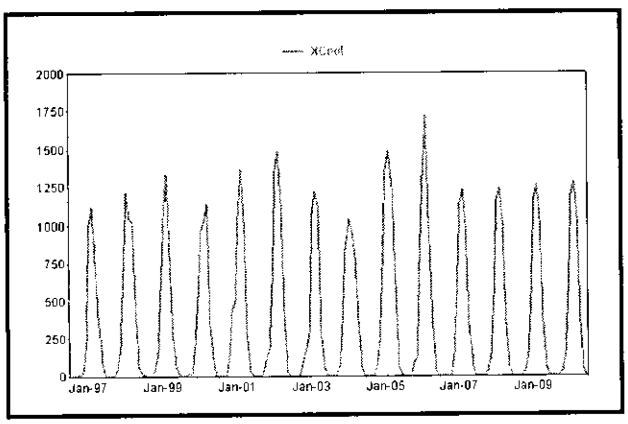


Figure 3: XOther (kWh)

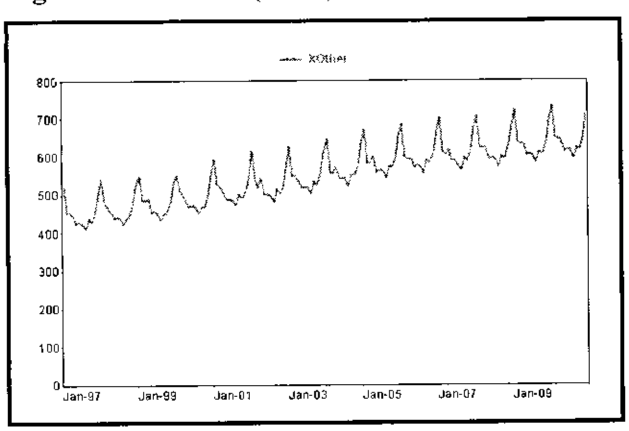


Figure 4: Residential Average Use Forecast (kWh)

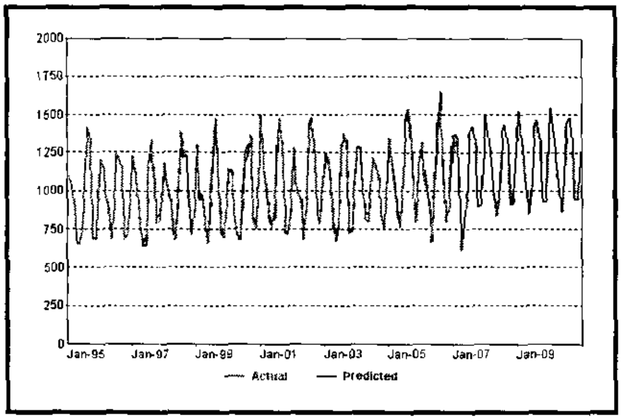


Figure 5: Commercial SAE Forecast Model (MWh)

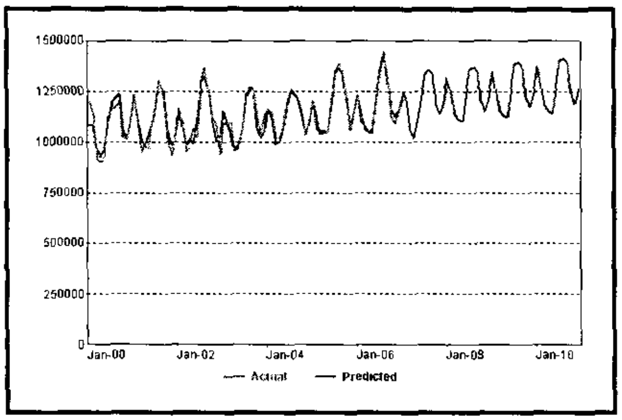


Figure 6: Residential Average End-Use Sales Forecasts (kWh)

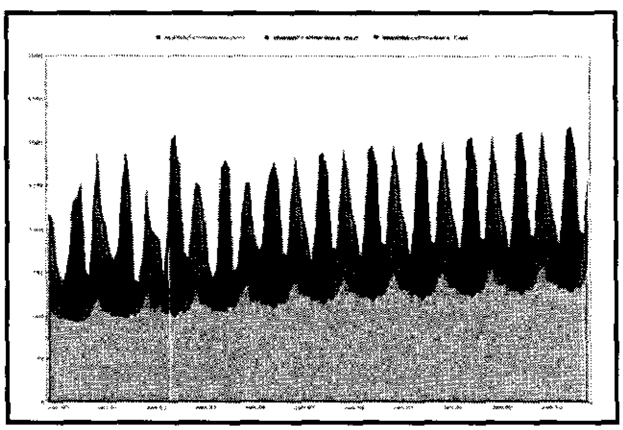


Figure 7: Residential Hourly Load Forecast (Summer Week)

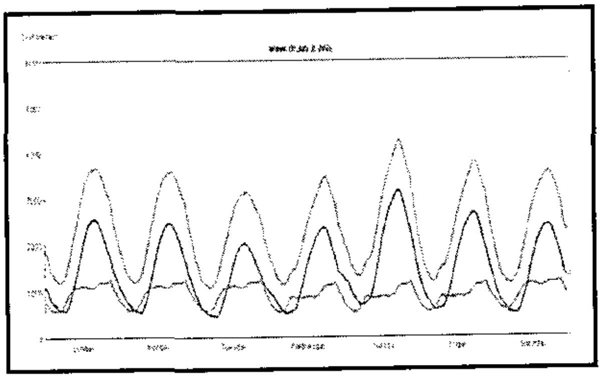
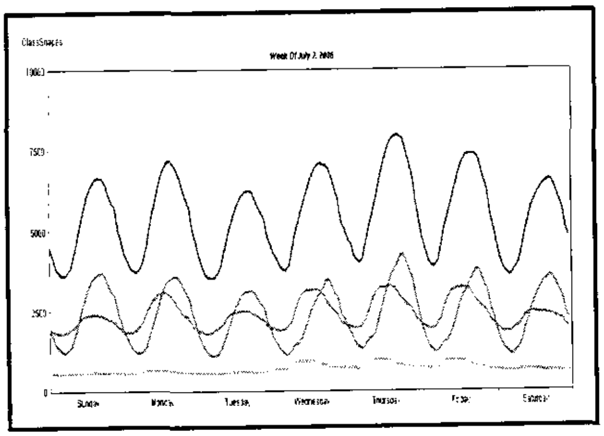


Figure 8: System Hourly Load Build-Up Forecast



ATTACHMENT B

WAIVER REQUESTS RELATED TO DEMAND-SIDE RESOURCE ANALYSIS 4 CSR 240-22.050

(1) 4 CSR 240-22.050 (2)

Current requirement:
Section 22.050(2) in its entirety specifies the required methods for calculating and allocating avoided costs.

Proposed Alternative:
Insert following the first paragraph of section (2)

As an alternative to the procedure outlined in subsections (A) – (D), AmerenUE may use a forecast of the market cost of power, including any regulatory capacity cost, for the calculation of avoided capacity and running costs. If AmerenUE chooses the market cost of power approach, any reference to avoided new generation (or avoided generation, or avoided capacity, or avoided generation capacity, or avoided peaking capacity, or avoided energy, or avoided running cost) in section 22.050(2) shall be deemed to refer to the market cost of power. If this alternative method is employed, AmerenUE shall adjust this market price to account for transmission and distribution avoided costs as well as probable environmental costs pursuant to 4 CSR 240-22.040(2)(B).

In addition, AmerenUE shall describe its method for (1) grouping hourly forecasted prices into avoided cost periods to reflect significant differences in the seasonal and/or hourly variation in prices, and (2) for allocating regulatory capacity costs to these periods.

Rationale:
One of the primary requirements of the Electric Utility Resource Planning rule is to consider demand-side resources on an equivalent basis with supply-side alternatives. In this particular section of the rule, this requirement is manifested by requiring AmerenUE to calculate supply-side costs for use in the demand-side cost-effectiveness screening. This basic concept is still as valid today as it was when the rule was developed. However, the prescriptive method detailed in this section to achieve the "equivalent treatment" is outdated. In fact, the extremely prescriptive steps and the lack of flexibility could lead to the demand-side resources receiving a less than equal treatment during screening. This waiver request allows AmerenUE to use a method of calculating avoided costs that is more reflective of modern wholesale markets and will further support the "equivalent treatment" requirement.

The market cost of power better represents the value of an avoided kW or kWh in today's market. The two most important reasons that the forecast of power cost methodology is superior are as follows:

1) Even if AmerenUE does not require additional capacity or energy in the near-term, thus suggesting that the value of DSM would be low, an avoided kWh or kW could have substantial value by enabling AmerenUE to sell the incremental load into the market. For both supply-side and demand-side resources, this value would be captured in the "Integrated Resource Analysis" (4 CSR 240-22.050). However, to the extent that the utilities avoided costs are less than the value received from market sales (both capacity and energy), potentially demand-side programs that could show cost-effective in integration might be screened out in the cost-effectiveness screening.
2) It is rare that an individual utility is neither long nor short on generation (i.e. generating resources) and if a utility's resources exactly meets its demand, the situation will change in the near future due to load growth. In fact, a particular utility's resource needs (or avoided capacity and energy costs) is somewhat dynamic due to changes in load and resources. These variations in resource needs can translate into varying avoided costs over time which in turn can cause vacillation in demand-side programs screening as cost-effective leading to fluctuations in demand-side spending. Since the wholesale markets (i.e. MISO) encompass numerous utilities, the market as a whole is subject to less resource fluctuations. Using the forecast for market power cost would facilitate more consistent investment in demand-side resources.

(2) 4 CSR 240-22.050 (3)(F)

Current requirement:
End-use measures that pass the probable environmental benefits test must be included in at least one (1) potential demand side program.

Proposed Alternative:

If AmerenUE does not include each end-use measure that passes the probable environmental benefits test in at least one potential demand-side program, it shall provide an explanation as to why that measure was not appropriate for inclusion.

Rationale:
This section addresses the cost-effectiveness screening of end use measures. Typically several hundred measures are screened to determine which measures should be included in the energy efficiency programs that will be assessed in subsequent stages of the analysis. The objective of that program analysis step is to combine measures in such a way that the program represents a compelling program offering to a particular market segment. The initial list of measures can include those that, while passing a simple cost-effectiveness test, are not easily or logically bundled with other measures as part of a program, and the design of a program solely to incorporate these measures may be

inefficient and inconsistent with best practice program design. The intent of this waiver is to create the flexibility to exclude measures passing the cost-effectiveness screen if the projected impacts are extremely small, or if those measures cannot logically be bundled into programs or offered as a cost-effective stand-alone program. AmerenUE would be required to present the results of the full measure screening and a justification as to why any cost effective measures would be excluded from further analysis. Absent this waiver, there is a greater premium placed on a qualitative screening process that can eliminate measures expected to have little impact in the market due to applicability or feasibility.

(3) 4 CSR 240-22.050 (4)

Current requirement:
The utility shall estimate the technical potential of each end-use measure that passes the screening test.

Proposed Alternative:
AmerenUE shall prepare an estimate of the achievable potential of programs screened as cost-effective under 4 CSR 240-22.050 (7). Achievable potential is understood to be equivalent to the incremental and cumulative demand reduction and energy savings described in Section 22.050 (7)(A). An estimate of achievable potential shall be prepared for multiple portfolios of programs, where at least one portfolio represents a very aggressive approach to encouraging program participation.

Rationale:
Three "types" of potential are sometimes estimated as part of a DSM analysis.

- Technical potential represents the amount of energy/demand reduction one might expect if all existing, replaceable energy-using equipment was replaced with its most efficient, available alternative irrespective of cost. This measure provides an indication of what might be considered the "latent efficiency" of the area of study (e.g. AmerenUE's service territory.
- Economic potential represents the amount of energy/demand reduction one might expect if all existing, replaceable energy-using equipment was replaced with its most efficient, available and cost-effective alternative, where cost-effectiveness is measured by the probable environmental benefits test. This measure does not address the impacts of the attempt to capture this potential on the present value of revenue requirements, nor does it address the basic issue of whether consumers would be expected to actually adopt this level of efficiency. It is a broad measure of the "latent economic efficiency" of the area of study.
- Achievable potential represents amount of energy/demand reduction one might expect based on consumer adoption of cost-effective energy efficiency measures in response to utility-sponsored energy efficiency programs. This measure explicitly attempts to reflect consumer behavior in response to awareness, costs and incentives, and is estimated as the amount of energy/demand reduction over-and-above that expected to be realized by consumers acting in their self-interest (so-called "naturally-occurring" energy efficiency).

Estimates of the technical potential of end use measures reflect engineering calculations and are rarely if ever used in the design of energy efficiency programs. The key to the IRP process is having estimates of what is achievable, as those estimates will be central to the integration process. The most straightforward approach to this need is to develop estimates of the achievable potential associated with the programs that are analyzed. The nature of the program analysis process outlined in the rule ensures that the estimates produced in this fashion will be based on most of the measures screened as cost-effective under 4 CSR 240-22.050 (3)(F).

(4) 4 CSR 240-22.050 (6)(D)

Current requirement:
Design a marketing plan and delivery process to present the menu of end-use measures to the members of each market segment and to persuade decision-makers to implement as many of these measures as may be appropriate to their situation.

Proposed Alternative:
Include a delivery strategy that outlines the anticipated approach to promotion and delivery of the programs to the target market segment. This delivery strategy shall include basic information regarding marketing and implementation strategy as an element of program design and will outline approach, channels, and incentive, outreach and administrative processes. The strategies should be detailed enough to provide the Company and the parties with a sense of the proposed approaches as a basis for estimating program costs.

Rationale:
Typically, marketing and implementation plans are prepared following the finalization of the integrated plan. The marketing plan can and should be quite detailed with respect to marketing strategy, tactics, collateral and channels, and the "delivery process" typically is represented by an implementation plan that provides considerable detail on program processes and procedures pertaining to recruiting, technical services, incentive fulfillment, verification and quality control. The current Rule implies that such detail might be provided during the IRP development process. However, developing such detail would be inefficient since it is likely that some of the programs examined at this stage might never be implemented. AmerenUE is likely to develop several DSM portfolios with different program mixes, recognizing that only one such portfolio actually will be implemented. More important, detailed marketing and implementation plans should be prepared by the entities actually implementing the programs to ensure that accountability and expertise are properly aligned. The alternative language calls for the preparation of basic marketing and delivery strategies for each program considered in the process.

(5) 4 CSR 240-22.050 (9)

Current requirement:
Evaluation of Demand-Side Programs. AmerenUE shall develop evaluation plans for all demand-side programs that are included in the preferred resource plan selected pursuant to 4 CSR 240-22.070(6). The purpose of these evaluations shall be to develop the information necessary to improve the design of existing and future demand-side programs, and to gather data on the implementation costs and load impacts of programs for use in cost-effectiveness screening and integrated resource analysis.

Proposed Alternative:
Evaluation of Demand-Side Programs. AmerenUE shall develop process and impact evaluation strategies for all demand side-side programs that are included in the preferred resource plan. These strategies shall outline the proposed approach to the impact and process evaluation for the programs. Parts (A), (B) and (C) of the rule shall be considered advisory for purposes of developing these broad strategies. AmerenUE shall develop evaluation plans consistent with 4 CSR 240-22.050 (9) after final programs have been selected and detailed implementation plans have been prepared.

Rationale:
As is the case with marketing plans and implementation processes, evaluation plans typically are developed only after a final set of programs have been adopted. Moreover, evaluation plans can only be prepared once detailed program implementation plans have been completed. Detailed evaluation plans should be developed consistent with the provisions of the rule, but not at this stage. Evaluation plan effectiveness also requires that the plans should be developed by the entities retained by the Company to perform the evaluation(s). The effect of this waiver is simply to defer the detailed plans required until after a final program set has been selected and detailed program designs have been prepared.

(6) 4 CSR 240-22.050 (11)(C)

Current requirement:
The technical potential and the results of the utility benefits test for each end-use measure that passes the probable environmental benefits test;

Proposed Requirement:
The results of AmerenUE benefits test for each end-use measure that passes the probable environmental benefits test.

Rationale:
Consistent with waiver (3) proposed above.

(7) **4 CSR 240-22.050 (11)(D)**

Current requirement:
Documentation of the methods and assumptions used to develop the avoided cost estimates developed pursuant to section (2) including
1. A description of the type and timing of new supply resources, including transmission and distribution facilities, used to calculate avoided capacity costs;
2. A description of the assumptions and procedure used to calculate avoided running costs;

Proposed Alternative:
If AmerenUE chooses the forecast of market cost of power alternative for 4 CSR 240-22.050 (2)(C), the following is substituted for this portion of the rule:

Documentation of the methods and assumptions used to develop the avoided cost estimates developed pursuant to section (2) including
1. A description of the assumptions and procedures used for avoided capacity costs including regulatory capacity, transmission and distribution facilities;
2. A description of the assumptions and procedure used to calculate market cost of power;

Rationale:
Consistent with waiver (1) proposed above.

(8) 4 CSR 240-22.050 (11)(J)

Current requirement:
A description of the process and impact evaluation plans for demand-side programs that are included in the preferred resource plan as required by section (9) of this rule and the results of any such evaluations that have been completed since the utility's last scheduled filing pursuant to 4 CSR 240-22.080.

Proposed Alternative:
A description of the process and impact evaluation strategies for demand-side programs that are included in the preferred resource plan and the results of any such evaluations that have been completed since AmerenUE's last scheduled filing pursuant to 4 CSR 240-22.080.

Rationale:
Consistent with waiver (5) proposed above.

ATTACHMENT C

WAIVER REQUESTS RELATED TO INTEGRATED RESOURCE ANALYSIS 4 CSR 240-22.060

(1) 4 CSR 240-22.060 (4)

Current Requirement:
The utility shall assess the relative performance of the alternative resource plans by calculating for each plan the value of each performance measure specified pursuant to section (2). This calculation shall assume value for uncertain factors that are judged by utility decision-makers to be most likely.

Proposed Alternative:
UE will assess the relative performance of the alternative resource plans by calculating for each plan the value of each performance measure specified pursuant to section (2). This calculation shall be performed for each scenario in the probability tree.

Rationale:
This is fundamental to the analysis described in Section II of the 4 CSR 240-22.070 Risk Analysis and Strategy Selection waiver requests, and shown at the start of Step 2 illustrated in Attachment 1 of the waiver requests. For each individual scenario, at least two alternative resource plans will be selected to become candidate plans because one or both of them would be the "preferred plan" under that scenario, if that scenario were a certainty. This means that AmerenUE will perform the analysis envisioned by this rule for far more combinations of events than just a "most likely" one, and it will use resulting uncertainties in the ranking of the alternative resource plans to select a set of candidate resource plans for the risk analysis phase where the responsiveness of performance measures to the full range of critical uncertain factors for each candidate resource plan. This is a superior approach to the use of just a single "most likely" value for uncertain factors that are associated with a single scenario.

ATTACHMENT D

WAIVER REQUESTS RELATED TO
RISK ANALAYSIS AND STRATEGY SELECTION
4 CSR 240-22.070

I. BACKGROUND

Chapter 22 rules related to the consideration of environmental risk and uncertainty in the IRP process are primarily described in 4 CSR 240-22.070. When read in its entirety, 4 CSR 240-22.070 describes the main steps of a classic decision-analysis process. A classic decision analysis process first performs a deterministic assessment of a particular decision, second, applies a battery of sensitivity analyses to all of the uncertain inputs ("factors"), and third, develops a decision tree that applies probabilities to all of the sensitive uncertain factors to perform a probabilistic assessment of the decision in question. Other elements of a classic decision analysis include consideration of whether to gather more information on any of the uncertain factors before finalizing a decision ("value of information"), incorporation of the decision-maker's subjective assessments of risk and risk preferences in order to choose an option given the uncertainties that all of the options face, and examination of the probabilistic results to understand what outcomes of uncertain factors could alter the plan in the future ("contingencies"). The various sections of 4 CSR 240-22.070 would cause each of the above steps to be performed in an integrated resource planning (IRP) process to which they apply.

However, 4 CSR 240-22.070 also has several requirements that are a highly specific application of such a decision analysis process. At the time the rules were written, the Commission determined that these specifics were appropriate. However, twenty years later, the range of options for utility planning, and the circumstances affecting power markets have changed substantially, and some of the specific requirements of 4 CSR 240-22.070, if adhered to as currently stated, would hinder AmerenUE from using what it considers to be the most effective application of the decision analysis approach to IRP today. For example, 4 CSR 240-22.070 lists specific uncertain factors that must be addressed in sensitivity analysis. That list does not include some of the uncertain factors that are expected today to be the most critical, a salient one being the potential for future carbon emissions limits. Unfortunately, it is not possible to simply add carbon policy to the list of uncertain factors to be included in the sensitivity analysis phase, and thereby bring the rules of the process up to date. Rather, if carbon limitations were to be imposed, this event would have direct and indirect effects on many of the other listed uncertain factors. It could also cause some other, unlisted factors to become critical uncertain factors. The interrelatedness of many critical uncertain factors around the outcome of potential carbon policy calls for a more advanced form of sensitivity analysis described in decision analysis textbooks, called joint sensitivity analysis. The specificity of some of the requirements of 4 CSR 240-22.070 makes it difficult to readily incorporate joint sensitivity analysis and related aspects of addressing climate policy uncertainty into the IRP process.

AmerenUE believes that joint sensitivity analysis is well suited to address the highly interrelated uncertainties that utilities face in performing sound resource planning. The approach described below is rapidly becoming the standard method that U.S. utility decision makers are using to estimate business risks from potential climate policy. AmerenUE has proposed specific alternatives to the Chapter 22 requirements that it believes are necessary to enable application of the more up-to-date environmental and risk analysis approach, and it requests that these modifications be granted as waivers from Chapter 22 rules. In developing a sound approach for addressing environmental uncertainty and risk in today's world, AmerenUE is also striving to create consistency across the entire IRP process. Thus, AmerenUE requests waivers from Chapter 22 rules prior to 4 CSR 240-22.070 where uncertainties are addressed in earlier stages of the IRP process, as well as waivers related to 4 CSR 240-22.070 which is specific to risk.

II. DESCRIPTION OF SCENARIO-BASED UNCERTAINTY ANALYSIS PROCESS

Attachment 1 to this document contains a pictorial representation of the flow of analysis activity that will be used to capture the overall requirements for deterministic analysis, sensitivity analysis, and probabilistic analysis in 4 CSR 240-22.070, and which encompass the core elements of any classic decision analysis. For purposes of exposition, the total process is segmented into three steps. Steps 1 and 2 lie within the deterministic phase of the decision analysis cycle, and Step 3 comprises the probabilistic and informational phases of the decision analysis cycle.

Step 1

An important feature of the process outlined in Attachment 1 is its reliance on a set of scenarios that will each reflect an integrated, internally consistent set of energy and environmental input assumptions. This foundation is built in "Step 1", where a probability tree is developed to describe multiple combinations of critical uncertain factors that have interrelated impacts on multiple energy and environmental projections that are key to an IRP analysis. Each endpoint of the probability tree is an individual integrated scenario. One of the uncertain factors in the probability tree will be the future carbon policy outcome itself, and other uncertain factors in the tree will include other important modifiers of the impact of carbon policy, and/or other uncertain outcomes that also can have significant impacts on the interrelated set of energy and environmental projections that can affect resource plan performance and IRP decisions.

The probability tree shown in "Step 1" is a device to describe a set of scenarios (and their associated likelihoods) that a sound IRP process should explicitly consider. A sound IRP should chart a course from the present moment that balances the variety and range of risks reflected in the full set of scenarios. A sound IRP also, to the extent possible, would be flexible to be adapted to any of the futures represented by any single branch of the probability tree (but with emphasis being given to adaptability to respond to the outcomes that otherwise would result in the more negative impacts to the company and its ratepayers). Thus, the most important feature for a sound IRP in the face of highly interrelated sources of uncertainty is to base the entire process of constructing and winnowing out candidate resource plans on a range of internally consistent scenarios. This contrasts to the approach prescribed in Chapter 22 rules that would incorporate the information in the probability tree only in the probabilistic phase.

Step 1 begins with the development of a probability tree that will produce a set of future energy and environmental projections that are all mutually consistent with a particular set of future policy and technology developments. In the technical language of decision analysis, these scenarios will be used for joint sensitivity analysis during the deterministic phase of the analysis. (All "sensitive" scenarios found in the joint sensitivity analysis will also be carried through to the probabilistic phase of Step 3. However, in Step 3, the probability tree would be enlarged to include any uncertain factors that are independent of those affecting the scenarios but which are found to be critical uncertain factors in additional individual sensitivity analyses that occur in Step 2).

AmerenUE will develop mutually consistent sets of input assumptions for each scenario through the application of an integrated model of the energy and environmental system. Such a model needs to be able to simultaneously simulate interactions in fuel markets, energy demands, electricity generation system operation, non-electricity sector outcomes, macroeconomic activity levels, and responses to emissions limits that may be applied to sources throughout the economy, and not just to electricity generators. Thus, the scenarios in the probability tree in Step 1 will actually be analyzed as a set of model runs (e.g., eight runs, in the illustrative example of the attachment) using an integrated energy-environmental model with the above capabilities. The output of each model run (i.e., for each scenario in the tree) will be an integrated set of projections of key inputs to a standard analysis to select a resource plan. Each integrated set will include projections through the planning horizon of electricity load growth, changes in wholesale electricity prices, emissions allowance prices (for SO_2, NO_x, mercury, and CO_2) natural gas prices, coal prices, and AmerenUE's optimal emissions control retrofits (and their timing).

The development of a probability tree of interrelated energy and environmental critical uncertain factors by AmerenUE is thus a major modeling activity in its own right, although using national-scale models. In contrast, the modeling used for the analysis and selection of an acquisition resource strategy for AmerenUE is more local in scope, at the system and regional level, although this modeling exercise uses as inputs, results from the national-scale modeling. Thus, AmerenUE separates the development of the scenarios and associated integrated modeling of those scenarios into its own step (i.e., Step 1) of the IRP process that will precede the development of candidate resource plans on a deterministic basis (i.e., in Step 2). Additionally, AmerenUE recognizes that it cannot know *a priori* what types of uncertain events will have the most effect on the variation of integrated projections, although it is almost certain that one of these will be the carbon policy uncertainty. In Step 1, the sensitivity of the scenario outputs will be explored for a number of different uncertain factors that can affect integrated energy systems. The final probability tree will be developed to include the uncertain factors that have the most effect on the interrelated projections of resource plan performance. The tree shown in Attachment 1 is therefore merely illustrative of the general concept, and the final tree may have quite different branches.

Step 2

Once finalized, the integrated projections for each of the scenarios in the probability tree developed under Step 1 will be used in Step 2 (see Attachment 1) to identify candidate resource plans. This will be done for each scenario, one by one, so that the final set of candidate resource plans will include at least two resource plans that would be desirable alternatives under each of the scenarios *if the scenario were deterministically known*. All other remaining uncertain factors will be subjected to individual sensitivity analysis during Step 2, in the manner already provided for in the rules. Thus, the deterministic analysis process in Step 2 is expected to be fully consistent with that established in the IRP Chapter 22 rules. The only new aspect of this process is the iterative use of each of the scenarios and associated inputs for critical uncertain factors to select a set of candidate resource plans for probabilistic evaluation (i.e., for the risk analysis). This is an enhancement to the currently prescribed process because it performs joint as well as individual sensitivity analysis, and it does so for a more comprehensive set of uncertain factors than those specifically identified in the rules.

Step 3

Step 3 starts at the point where probabilistic analysis is initiated. This is the analysis that helps a decision maker choose among the candidate resource plans by balancing their risks (i.e., the potential downside due to uncertainties) against maximizing their expected outcomes on multiple IRP objectives. Chapter 22 rules specify that this be done using a sequential decision tree in which resource decisions at each time step into the future are interleaved analytically with potential new information on the critical uncertain factors. However, under the scenario-based approach described here, each of the candidate resource plans going into Step 3 will be defined as a sequence of resource investments over the full modeling horizon into the future. That is, each candidate to assess is already a full "plan" and not a single resource acquisition at a single point in time. The set of these resource plans will have been created in Step 2 to include entire sequences of resource acquisitions throughout the planning horizon that each makes sense in at least one of the potential future scenarios. The task in Step 3 is thus to choose which candidate plan is the best plan for the company to select as its working vision of the resource acquisitions that are expected to best satisfy its future resource needs.

In Step 3, the expected benefits and the probability distribution of the benefits of each of these candidate plans will be assessed probabilistically using the probability tree from Step 1, but now expanded to include any other independent uncertain factors identified as critical in Step 2. This probabilistic evaluation will provide company decision makers with information to help them identify which future course of investments appears to be the best path given present uncertainties. Certainly, as the subjective assessments by AmerenUE's decision-makers of

(3) **4 CSR 240-22.070 (3)**

Current Requirement:
For each alternative resource plan, the utility shall construct a decision-tree diagram that appropriately represents the key resource decisions and critical uncertain factors that affect the performance of the resource plan.

Proposed Alternative:
AmerenUE will construct a probability-tree diagram that appropriately represents the interdependent critical uncertain factors that affect the performance of the resource plans.

Rationale:
See discussion in Section II above.

(4) **4 CSR 240-22.070 (4)**

Current Requirement:
The decision-tree diagram for all alternative resource plans shall include at least two (2) chance nodes for load growth uncertainty over consecutive subintervals of the planning horizon. The first of these subintervals shall be not more than (10) years long.

Proposed Alternative:
AmerenUE is requesting a complete waiver from the requirement of section 4 CSR 240-22.070 (4).

Rationale:
Under the proposed approach, AmerenUE would seek a waiver from this requirement in its entirety, as it would not be relevant given the waiver sought under 4 CSR 240-22.070 (3). Load growth uncertainty would, however, still be represented in the scenarios, and so it would be included in the probabilistic assessment under 4 CSR 240-22.070 (5).

(5) **4 CSR 240-22.070 (5)**

Current Requirement:
The utility shall use the decision-tree formulation to compute the cumulative probability distribution of the values of each performance measure…

Proposed Alternative:
AmerenUE will use the probability-tree formulation to compute the cumulative probability distribution of the values of each performance measure…

Rationale:
See discussion in Section II above.

(6) 4 CSR 240-22.070 (11) (A)

Current Requirement:
As part of its reporting requirements, the utility is required to furnish:
A decision-tree diagram for each of the alternative resource plans along with narrative discussions of the following aspects of the decision analysis:

1. A discussion of the sequence and timing of the decisions represented by decision nodes in the decision tree; and
2. An explanation of how the critical uncertain factors were identified, how the ranges of potential outcomes for each uncertain factor were determined and how the subjective probabilities for each outcome were derived.

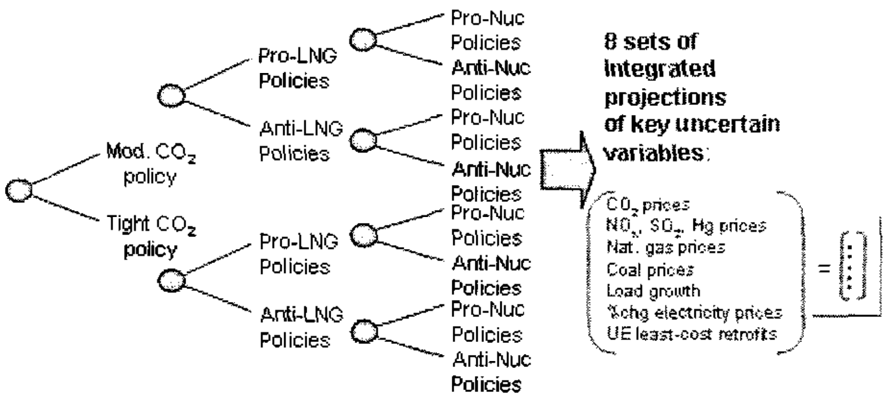
Proposed Alternative:
AmerenUE will furnish a probability-tree diagram applied to each of the alternative resource plans along with narrative discussions of the following aspects of the decision analysis:

1. A discussion of the sequence and timing of the decisions represented by each alternative resource plan, and how the set of resource plans was developed to be responsive to the range of uncertainties in the probability tree; and
2. An explanation of how the critical uncertain factors were identified, how the ranges of potential outcomes for each uncertain factor were determined and how the subjective probabilities for each outcome were derived.

Rationale:
See discussion in Section II above.

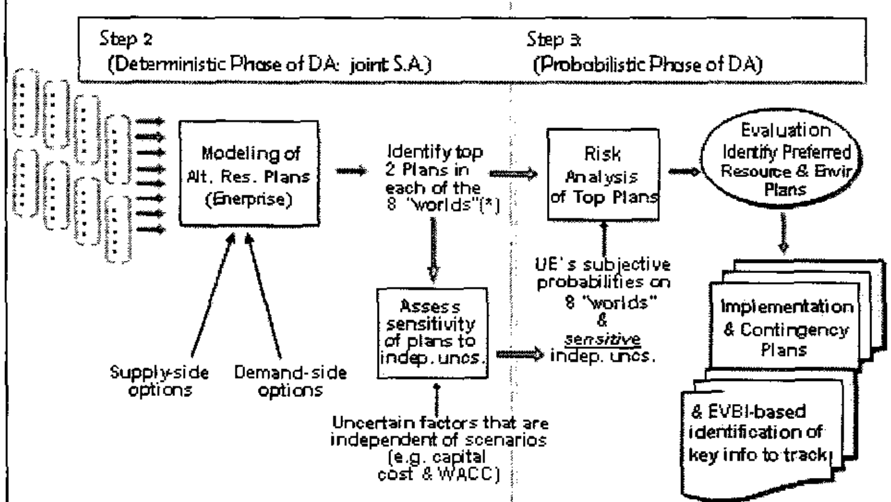
ATTACHMENT 1.
ILLUSTRATION OF SCENARIO-BASED PROCESS FOR HANDLING ENVIRONMENTAL AND OTHER RISKS IN IRP

Step 1: Create Sets of Integrated Planning Input Projections ("Scenarios") Using Integrated Environmental-Energy Model



Note: The tree illustrated above reflects uncertainties on carbon policy, gas supply conditions, and nuclear capacity. However, an analysis phase will be conducted before finalizing choices of variables represented in the probability tree. We will also explore whether forecasted improvements in energy efficiency technologies may have more impact on the projected integrated projections than one of the other uncertainties. If so, it will be included in the tree, perhaps in place of one of the other illustrated uncertain variables. There may also be additional branches, such as one with no CO_2 policy. The final tree may not necessarily be symmetric.

Steps 2 & 3 : Use Integrated Scenarios to Create Candidate Plans, Additional Sensitivity Analysis and Perform Uncertainty Analysis



(*) Not strictly limited to plans in top 2;
will also review for evidence of robust plans at tertiary level

MISSOURI PUBLIC SERVICE COMMISSION

May 10, 2007

Case No. EO-2007-0409

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Enclosed find a certified copy of an ORDER in the above-numbered case(s).

Sincerely,

Colleen M. Dale
Secretary