

Exhibit No.

Issue: Rate Design, IEC, FAC

Witness: H. Edwin Overcast

Type of Exhibit: Direct Testimony

Sponsoring Party: Empire District

Case No.

**FILED**<sup>3</sup>

**Before the Public Service Commission  
of the State of Missouri**

DEC 2 8 2004

Missouri Public  
Service Commission

**Direct Testimony**

**of**

**H. Edwin Overcast**

**April 2004**

Exhibit No. 21  
Case No(s) EE-2004-0570  
Date 12-06-04 Rptr KF

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**H. EDWIN OVERCAST  
DIRECT TESTIMONY**

**Testimony of  
H. Edwin Overcast  
On behalf of  
The Empire District Electric Company**

**INTRODUCTION**

**Q. PLEASE STATE YOUR NAME AND BUSINESS AFFILIATION.**

A. H. Edwin Overcast, Vice President R. J. Rudden Associates, Inc.

**Q. WHAT IS YOUR BUSINESS ADDRESS?**

A. My business address is 3521 Eagle Landing Drive, Snellville, Georgia 30039.

**Q. PLEASE SUMMARIZE YOUR EDUCATIONAL AND PROFESSIONAL EXPERIENCE.**

A. A detailed summary of my educational and professional experience is provided in Schedule HEO-1 to this testimony. I have a B. A. degree in economics from King College and a Ph.D. degree in economics from Virginia Polytechnic Institute and State University. I have been employed in the energy industry for almost 30 years in various rate, regulatory and planning positions. In my various positions, I have testified before state and federal regulatory bodies, state and federal legislative bodies and in various courts. My testimony has addressed a variety of issues including cost allocation, rate design, regulatory policy, open access and unbundling, bypass economics, forecasting, gas supply

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1 planning, and a number of other issues. In addition, I have been a lecturer in a  
2 number of energy industry sponsored training programs including: the Edison  
3 Electric Institute Rate Fundamentals Course and the Advanced Rate Course; the  
4 American Gas Association Rate Course and the Advanced Rate School; and the  
5 Southern Gas Association Intermediate Rate Course. Specifically, I have  
6 lectured on the principles of electric cost of service for both retail and wholesale  
7 jurisdictions.

8 **Q. ON WHOSE BEHALF ARE YOU APPEARING?**

9 A. I am appearing on behalf of The Empire District Electric Company ("Empire"  
10 or "the Company").

11 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

12 A. Empire requested that I review their retail rates with respect to rate design and  
13 provide recommendations regarding cost recovery. Based on that review, I  
14 discuss issues related to appropriate fixed cost recovery, the seasonal  
15 differential contained in the rates and make certain recommendations.

16 **Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.**

17 A. I recommend that the Missouri Public Service Commission ("the Commission")  
18 modify the existing rates as follows:

- 19 • Substantially increase the customer charge component, particularly for  
20 residential and commercial service rates to reflect fixed costs and to  
21 improve the efficiency of the rates;
- 22 • Reduce the seasonal rate differential contained in the energy charge of  
23 the rates and eliminate the seasonal demand charge as appropriate to

1 match actual cost differences and send more appropriate price signals to  
2 consumers; and

3 • Approve an alternative for managing the risk of changing fuel and  
4 purchased power costs.

5 **Q. HOW IS YOUR TESTIMONY ORGANIZED?**

6 A. The testimony is organized as follows: Section One summarizes rate design  
7 principles that underlie the recommended changes to the rates. Section Two  
8 discusses the seasonal differential and the qualitative and quantitative analyses  
9 supporting the recommended changes to the differential. Section Three  
10 discusses the issues of fixed cost recovery and the appropriate level for the  
11 customer charge in residential and commercial rates. Section Four discusses  
12 options for the recovery of the volatile fuel and purchased power cost  
13 component of the rates. Finally, Section Five provides a summary of my  
14 detailed recommendations and conclusions.

15

16 **SECTION ONE – PRINCIPLES OF RATE DESIGN**

17 **Q. PLEASE IDENTIFY THE PRINCIPLES OF RATE DESIGN YOU HAVE**  
18 **RELIED UPON TO ANALYZE THE ISSUES OF FIXED COST**  
19 **RECOVERY AND SEASONAL DIFFERENTIAL.**

20 A. There are a number of tariff design principles or objectives that find broad  
21 acceptance in regulatory and policy literature. These include:

22

23 1. Efficiency;

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2. Cost of Service;
3. Value of Service;
4. Stability;
5. Non-Discrimination;
6. Administrative Simplicity;
7. Comparability; and
8. Balanced Budget.

These rate design principles draw heavily on the "Attributes of a Sound Rate Structure" developed by James Bonbright in Principles of Public Utility Rates. Each of these principles plays an important role in analyzing the proposals developed in my testimony. To understand the role these principles play, each of the principles are discussed below.

**Q. PLEASE DISCUSS THE PRINCIPLE OF EFFICIENCY.**

A. The principle efficiency broadly incorporates both economic and technical efficiency. As such, this principle has both a pricing dimension and an engineering dimension. Economically efficient pricing promotes good decision-making by electric producers and consumers, fosters efficient expansion of capacity, results in efficient capital investment in customer facilities, and facilitates the efficient use of existing generation, transmission and distribution resources. Efficient prices reflect marginal cost while also recovering the total

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1 authorized cost of service. The efficiency principle benefits stakeholders by  
2 creating outcomes for regulation consistent with the long-run benefits of  
3 competition while permitting the economies of scale consistent with the best  
4 cost for service.

5  
6 **Q. PLEASE DISCUSS THE COST OF SERVICE AND VALUE OF**  
7 **SERVICE PRINCIPLES.**

8  
9 **A.** These principles each relate to designing rates that recover the total revenue  
10 requirement without causing inefficient choices by consumers. The cost of  
11 service principle contrasts with the value of service principle when certain  
12 transactions do not occur at price levels determined by embedded cost of  
13 service. In essence, the value of service acts as a ceiling on prices. Where  
14 prices are set at levels higher than the value of service, consumers will not  
15 purchase the service. From a market perspective, marginal cost serves as the  
16 floor for pricing. Therefore, appropriate prices must lie between the marginal  
17 cost floor and the value of service ceiling. The concept of cost of service is only  
18 relevant so long as it produces rates that fall within the floor and ceiling. These  
19 issues are most significant in relation to system bypass economics. If  
20 opportunities exist for economic bypass, the bypass option establishes the value  
21 of service ceiling. In the evaluation of a bypass response, rates should only be  
22 discounted to the marginal cost floor. Where the marginal cost floor is below  
23 the value of service, the bypass is uneconomic from a societal perspective and

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1 discounting benefits all market participants. Further, the calculation of the  
2 precise cost of service is not possible where joint and common costs must be  
3 allocated to customer classes. For this reason alone, the regulatory process  
4 produces multiple cost of service outcomes based on the assumptions regarding  
5 the allocation of joint and common costs. Nevertheless, cost of service studies,  
6 properly reflecting cost causation, provide a reasonable tool for the allocation of  
7 revenue requirements among customer groups.

8  
9 **Q. PLEASE DISCUSS THE PRINCIPLE OF STABILITY.**

10  
11 **A.** The principle of stability typically applies to customer rates. This principle  
12 suggests that reasonably stable and predictable prices are an important market  
13 feature. In competitive wholesale electric markets, the fundamental short-run  
14 nature of fixed supply and fluctuating demand creates short-term price volatility  
15 to clear the market. There will always be occasions where competitive market  
16 prices must rise in the short run to equate supply and demand. This volatility is  
17 a necessary condition for promoting economically efficient use of utility  
18 service. Utility consumers and regulators often desire price stability, and  
19 consequently only product and service offerings that feature stability on a  
20 seasonal, annual or multi-year basis are authorized. Thus, the risk of real-time  
21 market price instability is borne either by the utility or its customers on a  
22 prospective basis. Where the utility bears this risk, an appropriate rate of return  
23 on investment must be included in rates to compensate for this unique risk



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1 element. The cost for managing market price volatility (as measured by return  
2 requirements) is typically quite significant. In general, the preferred solution is  
3 to manage the risk through the market and pass those costs to consumers  
4 resulting in a lower total cost for most consumers. It is important to note that  
5 price signals only work if consumers who respond by reducing demand to  
6 alleviate the congestion receive some benefit from doing so. Thus, fixing retail  
7 prices denies the signal to consumers and frustrates the rationing efficiency of  
8 price signals.

9  
10 **Q. PLEASE DISCUSS THE CONCEPT OF NON-DISCRIMINATION.**

11  
12 **A.** The concept non-discrimination requires prices designed to promote fairness  
13 and avoid undue discrimination. Fairness requires no undue subsidization either  
14 between customers in the same class or across different classes of customers.  
15 Rates are subsidy free when no customer pays less than marginal cost or more  
16 than stand alone costs. Non-discrimination requires that all customers be  
17 charged the same price for comparable service. A key point with respect to  
18 non-discrimination is comparability of service. There are many factors used to  
19 determine comparable service. Among the factors are location, facility  
20 ownership, service voltage, demand characteristics, size, type of service and a  
21 variety of other considerations. The importance of comparability issues is  
22 critical to the development of non-discriminatory pricing. Equally important is  
23 the concept that no customer pays less than marginal cost. There are significant

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1           implications for this policy requirement relative to the customer charge  
2           component of residential and small commercial rates as discussed more fully  
3           below.

4

5       **Q.   PLEASE DISCUSS THE PRINCIPLE OF ADMINISTRATIVE**  
6       **SIMPLICITY.**

7

8       A.   The principle of administrative simplicity as it relates to tariff design requires  
9           prices reasonably simple to administer and understand. This concept includes  
10          price transparency. Prices are transparent when customers are able to  
11          reasonably calculate bill levels and interpret details about the charges resulting  
12          from the application of the tariff.

13

14       **Q.   PLEASE DISCUSS THE PRINCIPLE OF COMPARABILITY.**

15

16       A.   The principle of comparable services reflects consideration of the types and  
17          prices of services offered in other jurisdictions and by other companies in the  
18          same jurisdiction. It recognizes that fundamental service characteristics differ  
19          for many reasons and that there is much to gain from comparisons to the best  
20          knowledge and innovations reflected in other tariff designs.

21

22       **Q.   PLEASE DISCUSS THE PRINCIPLE OF THE BALANCED BUDGET.**

23

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1     A.     Finally, there is the critical principle that rates be designed to recover the  
2           allowed revenue requirement based on the cost of service. Rate design becomes  
3           a critical element for cost recovery. Improperly designed rates deprive the utility  
4           of a reasonable opportunity to recover revenue requirements where actual  
5           billing determinants and test year billing determinants differ, as they almost  
6           certainly will. If rate elements reflect marginal cost, changes in the billing  
7           determinants over time match changes in cost and revenues. Rates calculated at  
8           average cost may result in over or under recovery of costs as billing  
9           determinants change from those in the test year.

10

11    **Q.     ARE THERE CONFLICTS THAT OCCUR BETWEEN THESE**  
12           **PRINCIPLES?**

13

14    A.     Yes. These principles often result in conflicting guidance. Detailed discussion  
15           of tariff principles recognizes the potential and actual conflicts imposed by  
16           these principles. Indeed, Bonbright discusses these conflicts in detail. Tariff  
17           design recommendations must deal effectively with such conflicts. For example,  
18           as noted above, there are potential conflicts related to cost and value of service  
19           principles. There are direct conflicts between the use of embedded cost of  
20           service for determining revenue requirements, using average cost to price  
21           services and marginal cost pricing to promote efficiency.

22

1     **Q.     PLEASE DESCRIBE THE CONFLICT BETWEEN MARGINAL COST**  
2     **PRICE SIGNALS AND RECOVERY OF THE REVENUE**  
3     **REQUIREMENT.**

4  
5     **A.**    The conflict between good price signals based on marginal cost and a balanced  
6            budget or revenue recovery principle arises because marginal cost is below  
7            average cost due to economies of scale. Marginal cost tends to be either above  
8            or below average cost in both the short run and the long run. This means that  
9            marginal cost based pricing will produce either too much or too little revenue to  
10           support the revenue requirement. This suggests that efficient price signals  
11           require a multi-part tariff designed to meet the revenue requirements while  
12           sending marginal cost price signals related to consumption decisions. Properly  
13           designed, a multi-part tariff includes elements such as access charges, facilities  
14           charges, demand charges, consumption charges and the potential for revenue  
15           credits. Taken together, these elements permit good price signals and revenue  
16           recovery; however, the tariff design becomes more difficult to structure and  
17           likely will no longer meet the requirements of simplicity. Therefore, some  
18           economic efficiency may be sacrificed for certain customer classes in order to  
19           maintain simplicity. For example, it is not common to include demand charges  
20           in residential rates. From the view of economically efficient price signals, some  
21           efficiency is sacrificed. However, from an overall cost efficiency, the sacrifice  
22           is small because of the added costs to meter customer demand compared to the  
23           ability of customers to manage demand on their own.

1

2     **Q.     ARE THERE OTHER POTENTIAL CONFLICTS?**

3

4     A.     Yes. There are potential conflicts between simplicity and non-discrimination  
5             and between value of service and non-discrimination. Other potential conflicts  
6             arise when companies face unique circumstances that must be considered as  
7             part of the tariff design process.

8

9     **Q.     HOW ARE THESE PRINCIPLES TRANSLATED INTO THE DESIGN**  
10     **OF A RETAIL TARIFF?**

11

12     A.     The process of developing rates within the context of these principles requires a  
13             detailed understanding of all the factors that impact rate design. These factors  
14             include:

15

16             1. System cost characteristics such as the embedded customer, demand and  
17                 energy costs as well as marginal costs by season, time-of-day, voltage level  
18                 of service and type of service;

19             2. Customer load characteristics such as peak demand, load factor, seasonality  
20                 of loads, and quality of service;

21             3. Market considerations such as elasticity of demand, competitive fuel prices,  
22                 end-use load characteristics and bypass alternatives; and

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1           4. Other considerations such as the value of service ceiling/marginal cost floor,  
2           unique customer requirements, areas of under-utilized facilities,  
3           opportunities to offer new services and the status of competitive market  
4           development.

5  
6       **Q. PLEASE CONTINUE.**

7  
8       **A.** In addition, the development of rates must consider the existing rates and how  
9       modifications of those rates impact consumers. Where rates have not been  
10       regularly reviewed and adjusted to reflect current cost and operating realities,  
11       any plan to change rate design should consider a process to migrate gradually  
12       from old rates to new, to avoid significant potential adverse impact on customer  
13       total bills.

14  
15       Translation of objectives into rate design must also consider the anatomy of  
16       potential rates. The basic structure of a typical rate schedule consists of a  
17       customer charge and/or other fixed charges, demand charges, energy charges  
18       and automatic adjustment charges. There are numerous variations of rate  
19       designs using these basic components. In each case, a rate design seeks to  
20       recover the authorized level of revenue based on the actual billing determinants  
21       occurring during the test period used to develop the rates.

22  
23       **SECTION TWO- THE SEASONAL DIFFERENTIAL**

1

2     **Q.     PLEASE DISCUSS THE BASIS FOR A SEASONAL DIFFERENTIAL IN**  
3     **ELECTRIC RATES.**

4

5     A.     A seasonal differential is appropriate where costs differ significantly by season  
6           of the year. The seasonal differential recognizes that system operating  
7           conditions and therefore costs may differ in a predictable pattern. There are a  
8           number of reasons for costs differences to arise based on seasons of the year.  
9           The existence of seasonal cost differences is most often driven by the mix of  
10          fuels used to produce energy to meet the peak demands of the system and the  
11          intensity of those peak demands. Where the maximum demand on capacity of  
12          the system differs significantly, there may also be seasonal capacity cost  
13          differentials. It is important in analyzing seasonal cost differences to understand  
14          the total demand on the resources of the system. Customer load does not  
15          represent the total demand on the capacity resources of the system. The demand  
16          on system resources also includes scheduled outages, unit de-ratings and unit  
17          forced outages. These latter three demands generally represent a smaller total  
18          impact than load but must also be considered in evaluating seasonal differentials  
19          related to a capacity cost component.

20

21     **Q.     HAVE YOU REVIEWED THE SEASONAL COST DIFFERENTIAL**  
22     **FOR THE COMPANY?**

23

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1     A.    Yes. I have analyzed the seasonal energy and capacity cost differences and have  
2           determined that the current seasonal cost differential is too large and does not  
3           reflect the actual cost differences for the test year.

4

5     **Q.    PLEASE EXPLAIN THE ANALYSIS USED TO DETERMINE THE**  
6           **SEASONAL COST DIFFERENTIAL.**

7

8     A.    The fundamental consideration of the seasonal differential is to minimize the  
9           cost variance within a season and to maximize the variance of costs between  
10          seasons. The seasonal energy costs differential calculation uses an analysis of  
11          the average of the hourly marginal costs for the test year. The analysis begins by  
12          establishing certain practical constraints on the development of the differential.  
13          The practical constraints include the following: a season must consist of at least  
14          two consecutive months; a maximum number of four seasons is permitted; all  
15          days within a calendar month are treated equally; and seasons must begin at the  
16          beginning of a calendar month and end at the end of a calendar month. The  
17          second step of the analysis determined the variance of costs within a group of  
18          possible seasons and the variance between the seasonal options. The ratio of the  
19          cost variance between seasons and the cost variance within seasons that is the  
20          largest determines the best seasonal combination. This ratio is designated as the  
21          F-statistic. (One use of the F-statistic is to compare the variances of populations,  
22          hence the use of the term in this context.)

23



1     **Q.     PLEASE DESCRIBE THE RESULTS OF THE ANALYSIS.**

2

3     A.     Summary results are illustrated in Schedule HEO-2. As the schedule illustrates,  
4           the most appropriate seasonal combination based on energy costs consists of a  
5           peak season made up of the months of July and August and an off-peak season  
6           for the remainder of the year. This combination of months produces the largest  
7           value for the F-statistic. Under the current tariff, the summer season consists  
8           largely of the billing months of June through September. This option results in a  
9           substantially lower F-statistic and therefore does not represent the most  
10          appropriate costing period for seasonal rates. The difference in marginal cost  
11          between the seasons represents the maximum seasonal differential in the energy  
12          cost component of the rate.

13

14    **Q.     PLEASE DESCRIBE THE APPROPRIATE DIFFERENTIAL IN THE**  
15    **SEASONAL COMPONENT OF THE ENERGY CHARGE.**

16

17    A.     The energy charge differential should reflect the difference in marginal costs  
18           between the seasons adjusted for the losses associated with the voltage level of  
19           service. The differential between the peak season (defined as the calendar  
20           months of July and August) and the off-peak season (the other ten months of the  
21           year) at the generation bus is \$ 0.01215 per kilowatt-hour. This value is divided  
22           by one minus the loss factor applicable to the particular service schedule  
23           produces the maximum seasonal differential. If rates are not based on marginal

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1 cost but on average cost, there is almost no seasonal differential. In that case,  
2 the differential is \$ 0.00418 per kilowatt-hour adjusted upward for the losses as  
3 noted above. In any event, there is no justification for the current differential of  
4 over two and one-half cents.

5  
6 **Q. WHAT IS THE IMPLICATION OF THIS ANALYSIS FOR THE**  
7 **SEASONAL DIFFERENTIAL IF THE CURRENT PEAK SEASON IS**  
8 **MAINTAINED?**

9  
10 **A.** The continuation of the current season for purposes of rate stability would  
11 produce an even lower season differential based on either marginal or average  
12 cost. On the basis of marginal cost the resulting differential is \$0.00683 divided  
13 by the loss adjustment factor or less than one cent per kilowatt-hour. The  
14 average cost differential is well below this figure at \$0.00219 divided by the  
15 loss adjustment factor. At these levels, the seasonal differential becomes  
16 inconsequential to consumers. Further, the implicit intra-class subsidy resulting  
17 from the collection of a disproportionate share of fixed costs from customers  
18 using more energy becomes larger than the seasonal differential. This implies  
19 the need for a declining block rate in both the peak and off-peak season.

20  
21 **Q. HOW DOES THE ISSUE OF MARGINAL CAPACITY COST IMPACT**  
22 **THE SEASONAL DIFFERENTIAL?**

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1     A.     Given the current capacity situation and the annual demands on that capacity,  
2           there does not appear to be a seasonal capacity cost differential. The maximum  
3           winter and summer peak loads are nearly equal. When the total demand on  
4           capacity is considered, there is no justification for a seasonal allocation of  
5           marginal capacity costs. Further, short-run marginal capacity costs associated  
6           with generation are zero. That is, the Company has no immediate plans to  
7           expand capacity. With respect to the distribution peaks, or the class non-  
8           coincident peaks, residential customers are winter peaking, as are the total  
9           electric and space-heating commercial classes. These same classes also  
10          experience their maximum coincident peak in the winter as well. It is reasonable  
11          to conclude that the only basis for the seasonal differential is the marginal  
12          energy cost differences.

13

14     **Q.     PLEASE SUMMARIZE YOUR RECOMMENDATIONS RELATED TO**  
15     **THE SEASONAL DIFFERENTIAL.**

16

17     A.     The current differential is too large and needs to be reduced for all classes of  
18           customers where a seasonal differential is part of the rate schedule. The current  
19           peak season is not optimal on an analytic basis. While an alternate definition of  
20           the peak season is attractive from a technical perspective, the practical aspects  
21           of altering the peak season probably do not warrant the change currently. These  
22           practical aspects include the necessity to provide consumers with the  
23           information required to respond to a changing set of price signals and to analyze

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1       the customer impacts of such a change. Since even the optimum peak season  
2       has a relatively small differential, changing the definition does not seem  
3       warranted. It is much more important, in my view, to redesign the rates with a  
4       smaller differential and to increase fixed charges, as discussed below, to reflect  
5       the significant fixed cost component of the rates. I recommend the following:

- 6       • The maximum differential for each class be set at the loss-adjusted level  
7       using the generation cost of \$0.0068 per kilowatt-hour.
- 8       • Where the Company uses energy only rates, the rate structure adopted  
9       by the Company be a declining block rate in both seasons with the peak  
10      season last block of the rate being higher than the off-peak season as  
11      discussed above.

12  
13   **SECTION THREE – FIXED COST RECOVERY AND CUSTOMER CHARGES**

14  
15   **Q.   PLEASE DISCUSS THE IMPORTANCE OF RECOVERING FIXED**  
16   **COSTS IN FIXED CHARGES.**

17  
18   **A.**   The typical electric utility has both fixed and variable costs. On average about  
19       60% of electric costs are fixed. Sound rate design permits recovery of fixed  
20       costs in fixed charges. Importantly, the economic circumstances for the  
21       Company require higher customer charges to promote economic efficiency.

1     **Q.     PLEASE DESCRIBE THE ROLE OF CUSTOMER CHARGES IN**  
2     **SOUND RATE DESIGN.**

3  
4     A.     The customer charge is an important element of an economically efficient and  
5     sound rate design. At a minimum, the customer charge recovers the out of  
6     pocket cost of serving a customer (the marginal customer costs). At the  
7     maximum, an efficient customer charge recovers all of the fixed costs of service  
8     to customers. The marginal customer cost includes the carrying cost of the  
9     capital invested in facilities at the customer's location, the cost of meter reading,  
10    billing, customer service and any other costs associated with the facilities at the  
11    customer's premises. The customer charge is also the element of rate design that  
12    is the appropriate element to recover average costs above marginal costs in an  
13    efficient rate design. To provide context for the role of the customer charge in  
14    rate design and to guide the choice of an efficient customer charge from within  
15    the theoretical range, the appropriate basis for analysis relies on the principles of  
16    rate design discussed in Section One above. The principles of rate design  
17    provide important guidance for the appropriate level of the customer charge as  
18    discussed below. Importantly, these principles support significant increases to  
19    the customer charge component of the electric rates proposed in this case.

20  
21    **Q.     PLEASE DESCRIBE THE ROLE OF THE CUSTOMER CHARGE AS IT**  
22    **RELATES TO THE PRINCIPLES OF STABILITY AND A BALANCED**  
23    **BUDGET.**

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1

2     A.     With respect to the balanced budget or revenue related attributes, increased  
3           customer charges result in a better opportunity for the Company to recover the  
4           approved revenue requirement. The obvious reason is that the normal weather  
5           used to design rates is unlikely to occur. Higher customer charges lessen the  
6           impact of weather variation on the revenues from higher or lower kilowatt-hour  
7           sales. For the delivery or distribution service portion of revenue requirements at  
8           issue in this case, the costs are fixed and do not vary with the weather or even  
9           with the level of energy consumed. As a corollary, the higher customer charges  
10          reduce the adverse impact on customer bills associated with colder than normal  
11          winter weather and warmer than normal summer weather. Customer bills are  
12          lower than normal with warmer winter weather because of lower kilowatt-hour  
13          charges and lower than normal with cooler summer weather for the same  
14          reason. There are tangible policy benefits for customers from this rate design  
15          change. For example, the customers most affected by warmer than normal  
16          weather- low-income customers- benefit from the bill mitigation under warmer  
17          than normal weather. These customers typically demonstrate relatively greater  
18          weather sensitivity than do customers as a whole because of the relative  
19          efficiency of their available stock of capital. By collecting more revenues in the  
20          customer charge and less in weather sensitive kilowatt-hour rates, these  
21          customers experience lower overall bill increases and without bearing a  
22          disproportionate share of fixed costs. Further, customers experience greater bill  
23          predictability from this proposal. In the future, it is reasonable to expect that

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1 both cost and efficiency will require further increases in the customer charge.  
2 Implementing the increased customer charges proposed by the Company now in  
3 conjunction with the proposed rate increase takes the first step toward  
4 significantly improved rates. The rate design proposed by the Company  
5 enhances its financial flexibility by creating a more stable and predictable  
6 stream of revenues thus satisfying the principles of stability and a balanced  
7 budget.

8  
9 **Q. PLEASE EXPLAIN THE ROLE OF CUSTOMER CHARGES IN**  
10 **SATISFYING THE EFFICIENCY PRINCIPLE.**

11  
12 **A.** Economic efficiency requires that price (rates) equal short-run marginal cost.  
13 Nearly all of the costs for electric distribution are fixed. For this reason alone,  
14 the short-run marginal cost of the electric distribution or delivery system is  
15 close to zero. The short-run marginal cost of generation and transmission is the  
16 variable cost of production. The long-run marginal cost for electric distribution  
17 tends to be relatively low as well because most of the cost for new customers is  
18 related to extending the delivery system to attach new customers. This simply  
19 means that minimizing the kilowatt-hour charges for electric rates and  
20 increasing the customer-based charges produces more economically efficient  
21 rates.

1     **Q.     PLEASE DISCUSS THE ROLE OF THE CUSTOMER CHARGE IN**  
2     **SATISFYING THE VARIOUS COST PRINCIPLES.**

3  
4     **A.     By recovering fixed costs in fixed charges, rate design satisfies the various cost**  
5     **related principles discussed above. Among the important benefits of the**  
6     **proposed customer charge increase is the elimination of subsidies related to the**  
7     **distribution component of Company rates. The cost of service principle and the**  
8     **value of service principle require an understanding of the importance of the**  
9     **allocation of common costs. The argument related to the allocation of common**  
10    **costs among customer classes and within customer classes supports an increase**  
11    **in the customer charge. The test for subsidy free rates (in the economic context**  
12    **as opposed to the regulatory return analysis) requires that each rate element**  
13    **exceed marginal cost and that no customer pay more than the stand-alone cost**  
14    **of service. Failure to approve subsidy free rates causes economic distortions that**  
15    **harm all market participants. Subsidy free rates result in a sharing of common**  
16    **costs among customers and improve the economics for all customers. Where**  
17    **rates seek recovery of common costs above marginal cost in commodity related**  
18    **charges, there is a predictable result. Namely, customers make uneconomic**  
19    **decisions about their use of energy. Higher customer charges permit lower**  
20    **kilowatt-hour charges and move rates for consumption closer to the**  
21    **economically efficient level of marginal cost.**



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1     **Q.     PLEASE DESCRIBE THE ROLE OF THE CUSTOMER CHARGE IN**  
2           **SATISFYING THE PRACTICAL ASPECTS OF ADMINISTRATIVE**  
3           **SIMPLICITY AND NON-DISCRIMINATION.**

4

5     A.     Customer charge increases also satisfy the practical attributes of rate design. By  
6           adopting the proposed customer charges regardless of the final approved  
7           revenue level, the Commission continues the process of simplifying the rates  
8           while also providing the other benefits discussed above. Customers currently  
9           pay for other services with fixed costs through fixed charges. For example,  
10          network service providers use customer charges to recover costs and in some  
11          cases customers pay the entire network cost as a fixed charge. For example,  
12          telephone and cell phone users pay for the fixed cost network with customer  
13          charges. Movement to more efficient rate designs is a critical element in the  
14          process of improving the market for utility services.

15

16    **Q.     WHAT IS THE LEVEL OF AVERAGE CUSTOMER COSTS FOR**  
17           **RESIDENTIAL CUSTOMERS?**

18

19    A.     Based on the cost of service study filed by the Company, the average residential  
20          customer cost is about \$24.00 per month.

21

22    **Q.     WHAT IS THE LEVEL OF THE MARGINAL CUSTOMER COST FOR**  
23           **RESIDENTIAL CUSTOMERS?**

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1

2     A.     The marginal customer cost consists of the sum of the economic carrying cost of  
3           the investment in facilities at the customer premise plus the fully loaded  
4           expenses for meter reading, billing and customer service. This represents the  
5           minimum level of the customer charge. Customer related facilities include the  
6           electric meter, the service drop and the distribution transformer. The capital cost  
7           of these three local facilities is almost \$550 for a new customer. The carrying  
8           charge based on a levelized cost using the composite depreciation rate of 20  
9           years, the proposed capital structure and the proposed return results in a  
10          carrying charge for the financial aspect of this plant at over 13.5 percent.  
11          Adding a two percent adjustment for operation and maintenance (O&M)  
12          expense (the ratio of actual O&M to gross plant) results in a total plant cost of  
13          about \$85 per year. The fully loaded billing expense is over \$60 per year. As a  
14          result, a reasonable estimate of marginal customer cost is over \$12 per month.  
15          Thus, the customer charge should not be less than \$12 per month for residential  
16          customers.

17

18     **Q.     ARE THERE OTHER CONSIDERATIONS BEYOND EMBEDDED AND**  
19     **MARGINAL COST WHEN SETTING THE CUSTOMER CHARGE?**

20

21     A.     Yes. The design of economically efficient block rates suggests that the kilowatt-  
22           hour price be set at marginal cost and the remainder of the revenue requirement  
23           be recovered in the fixed charge. By adopting a declining block rate for both

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1 seasons, some of the costs that would otherwise apply to the customer  
2 component may be recovered in the initial rate block. Nevertheless, a substantial  
3 increase in the customer charge component of the rate is warranted.  
4

5 **Q. DO OTHER ELECTRIC UTILITIES, NOT SUBJECT TO**  
6 **REGULATION, USE HIGHER CUSTOMER CHARGES?**  
7

8 A. Yes. Cooperative utilities are not subject to rate regulation. A review of their  
9 minimum service charges demonstrates that the Company's current charge is  
10 well below those of other electric companies whose members determine the  
11 customer charge (Availability charge or minimum bill). Based on a review of  
12 the monthly fixed charge for residential rates among the Missouri cooperatives  
13 that provided information in response to my request or from their rates available  
14 on the internet only one has a fixed charge lower than the Company approved  
15 rate of \$8.75. Many of these cooperatives have fixed charges in excess of  
16 \$12.00 per month. The maximum charge is \$25.00 per month. The important  
17 point is that the customer-owners of these utilities accept the importance of the  
18 customer charge as a tool of sound rate design.  
19

20 **Q. PLEASE SUMMARIZE YOUR RECOMMENDATION REGARDING**  
21 **THE CUSTOMER CHARGE.**  
22

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1     A.     The residential customer charge needs to be increased to at least \$12.00 per  
2           month. For reasons of economic efficiency and maintaining appropriate rates for  
3           energy, I recommend a customer charge of \$15 per month. The commercial  
4           customer charge needs to be increased to at least \$20.00 per month. These  
5           increases should occur regardless of the final level of revenue requirement  
6           authorized in this case in order to improve the efficiency of the rates.

7

8     **SECTION FOUR- RECOVERING FUEL AND PURCHASED POWER COSTS**

9

10    **Q.     PLEASE DISCUSS THE REGULATORY TREATMENT FOR HIGHLY**  
11       **VARIABLE COSTS.**

12

13    A.     In many jurisdictions the cost of fuel and purchased power expense is recovered  
14           through an adjustment mechanism designed to permit periodic changes in this  
15           cost component to reflect the actual, prudently incurred cost of fuel and  
16           purchased power. In most cases, the cost of fuel and purchased power is based  
17           on competitive market transactions where the utility has no market power with  
18           respect to the price it pays for fuel purchases or to purchase power in the  
19           market. The market for fuels, in particular natural gas and oil, and the market  
20           for purchased power exhibit substantial price volatility in the short-run. To  
21           protect both consumers and investors from unfavorable outcomes as result of  
22           power cost variability, commissions employ a variety of cost adjustment  
23           options. In addition to cost adjustment options, there are other regulatory

1 alternatives designed to produce efficient outcomes for all stakeholders where  
2 costs are volatile and unpredictable.

3  
4 **Q. PLEASE DESCRIBE ALTERNATIVES TO ADJUSTMENT CLAUSES**  
5 **THAT MAY BE USED TO MINIMIZE THE RISK OF COST**  
6 **VOLATILITY.**

7  
8 **A.** There are several types of alternatives to adjustment clauses that have been  
9 approved by regulatory agencies. One such option is the use of a formula rate. A  
10 formula rate establishes the charge for service based on a specific formula  
11 approved in advance by the regulatory authority. The formula charge is  
12 calculated on a known frequency such as annual or quarterly. Charges resulting  
13 from the formula are applied during the formulaic period. A second option is for  
14 the utility to acquire its service from a third party using a competitive bidding  
15 process. Under this option, the price risk for the cost volatility is borne by the  
16 third party. The market determines the appropriate level of risk compensation  
17 and includes that cost as part of the bid price. Customers benefit from the fixed  
18 price of energy based on the winning competitive market bid. A third option is  
19 to insure against the risk of energy price volatility through a financial hedge. In  
20 this case, the cost of the hedge becomes a part of the utilities cost of service.  
21 The common element in any of the alternatives to cost volatility (and thereby  
22 earnings volatility) is to also develop an appropriate level of compensation for  
23 the risk borne by the utility under alternative solutions.

1

2     **Q.     DOES THE ABSENCE OF A FUEL AND PURCHASED POWER**  
3     **ADJUSTMENT CLAUSE IMPOSE UNIQUE RISKS ON THE**  
4     **COMPANY?**

5

6     A.     Yes. There is a substantial increase in risk under the circumstances faced by the  
7             Company. These risks are unique because most of the comparable companies  
8             used to estimate the required return typically operate under a different  
9             regulatory model. As a practical matter, a reasonable regulatory process must  
10            compensate the Company for such risks or must find an alternative that  
11            eliminates the risk. In all likelihood, the risk of fuel and purchased power costs  
12            is an asymmetric risk. That is, the outcome is more likely to reduce earning than  
13            to increase earnings. Standard rate of return does not compensate the Company  
14            for such asymmetric risks. Further, the cost of the risk compensation required  
15            tends to be large relative to the standard return component even for a fully  
16            integrated utility.

17

18     **SECTION FIVE- CONCLUSIONS**

19     **Q.     PLEASE SUMMARIZE YOUR RECOMMENDATIONS.**

20     A.     I recommend that the Company rates be designed with a substantially higher  
21             customer charge. I suggest that \$15.00 is appropriate for residential customers. I  
22             also recommend that the seasonal differential be reduced to reflect the actual  
23             cost differential based on the mix of generation and purchased power used by

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1       the Company. The resulting residential rate exhibits a declining block energy  
2       charge for both summer and winter. I also recommend that the Company  
3       institute a full tracking fuel adjustment clause, providing that legislation permits  
4       such a clause. If the fuel clause cannot be implemented, I recommend that the  
5       Company establish an Interim Energy Charge (IEC). The IEC should permit the  
6       Company to recover a reasonable level of fuel costs under extreme weather and  
7       operating conditions. In addition, if the Company is permitted an IEC the  
8       inherent risk of this procedure should be recognized by allowing the Company  
9       to keep a portion of any excess revenue resulting from the IEC as compensation  
10      for the unique risks resulting from the application of the IEC.