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Witness:	L. W. Loos
Type of Exhibit:	Rebuttal Testimony
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MISSOURI PUBLIC SERVICE COMMISSION

Case No. ER-2001-299

REBUTTAL TESTIMONY OF

L. W. LOOS

Exhibit No. 22
Date 5/29/01 Case No. ER-2001-299
Reporter KRM

On Behalf of

The Empire District Electric Company

Before the Public Service Commission of the State of Missouri

Case No.: ER-2001-299

Rebuttal Testimony of L. W. Loos

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Purpose

Q. Are you the same L. W. Loos who filed direct testimony in this Case No. ER-2001-299?

A. Yes, I am.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of this rebuttal testimony is to address the direct testimony of Staff witness Paul W. Adam with respect to his recommended depreciation rates for the Company. I will address four aspects of his testimony. These are:

1) Mr. Adam's suggestion that net salvage (salvage value less cost of removal) be expensed;
2) Mr. Adam's proposal that depreciation rates include no allowance for net salvage associated with final retirements;
3) Mr. Adam's use of mortality curve analysis to determine the life of production unit property; and
4) Mr. Adam's failure to synchronize life span and investment in his development of the depreciation rates he recommends for production plant including the State Line 2 combined cycle unit (SLCC).

The first issue relates to a change in accounting, the final three to the total level of depreciation expense.

Conclusions

Q. Please summarize the conclusions you present in your rebuttal testimony.

A. Mr. Adam has proposed radical changes in depreciation rate methodology and depreciation accounting. These radical methodology changes leave the Commission little leeway to choose something between the position of the Staff and the Company on these issues. If Mr. Adam's proposals were merely calculation differences, there would be opportunity to choose some of each. If the Commission changes methodology and accounting as recommended by Staff, it will be extremely difficult to go back to proven approaches if Staff's proposals are as inadequate as I believe.

Some of my specific conclusions are:

1) Mr. Adam's proposal to expense net salvage is incomplete, unnecessary, inequitable, and violates Commission accounting regulations.

2) Mr. Adam's failure to provide any allowance for net salvage associated with final retirements is inequitable and fails to reflect fundamental differences between gas and water utilities which abandon in place (retire) significant amounts of underground plant and electric utilities which have virtually no plant underground.

3) Mr. Adam's proposal to determine service life for production property on the basis of retirement history fails to consider these plants constitute unit properties in which the life of individual components is controlled by the economics of the whole, not the life characteristics of the individual components.

4). Mr. Adam fails to consider in depreciation rates the recovery of interim investment in power generating facilities which is required in order for the generating plants to achieve the average service life forecast.

5). Therefore, I recommend the Commission adopt the depreciation rates I present in my direct testimony, including recognition of the interim investment needed to achieve the 35-year life for SLCC which result in the recommended 4.99 percent depreciation rate for that plant.

6). This is a measured response to the issues as the Commission's current practice of requiring utilities to submit depreciation rate studies at least every five years provides a sound basis for making calculation, not methodological, adjustments to depreciation rates. Thus, the Commission can maintain control of depreciation rates through this periodic review process. The Commission may also direct the Company to make more fully developed studies of net salvage ratios, interim additions and final retirements to further refine future depreciation rate studies.

Introduction

Q. Do you sponsor any schedules in your rebuttal testimony?

A. Yes, I do. I sponsor two. Schedule LWL-3 is a detailed comparison of the impact of Mr. Adam's recommended depreciation expense rates and of the Company's proposed rates. This schedule can be used to measure the implications of various issues. Schedule LWL-4 contains an example of the implications on capital recovery of failing to include in the development of depreciation expense rates applicable to unit property (life span), the interim investment required in order for the property to achieve the life span assumed.

Q. Do you have any general observations regarding Mr. Adam's testimony?

A. Yes, I do. Careful reading of Mr. Adam's testimony demonstrates to me that he is much more concerned with mathematical precision than the reasonableness of the result. Mr. Adam's focus is solely on what has historically taken place instead of what is reasonably forecast for the future. The development of reasonable and adequate depreciation expense rates requires consideration of the life of assets and investment incident to achieving that life (including net salvage) over the entire life of the asset. Mortality analyses and historical net salvage experience are merely tools used to help determine what service life and net salvage will ultimately result. Mr. Adam's recommendation is that results of historical retirements (including net salvage) is the only consideration of what should be reflected in the determination of depreciation rate to be used in the future. Mr. Adam's concern with the method employed is demonstrated by his use of service lives expressed to the nearest 1/10 of a year. Mr. Adam's proposal that net salvage be expensed is clear evidence of his backward looking concern.

Q. Have you prepared an exhibit which details differences between your recommended depreciation rates and Mr. Adam's?

A. Yes, I have. I prepared Schedule LWL-3 to show in detail the differences between Mr. Adam's and my proposal relative to the current depreciation rates in effect. As shown in Schedule LWL-3, I have broken down the annual increase in depreciation expense as proposed by the Company into three components. These are the increase (decrease) due to change in base rate, the increase (decrease) due to the change in net salvage allowance, and the increase (decrease) due to amortization of any reserve deficiency (or excess). The change due to base rate relates solely to the difference in service life used (or implied). The change due to salvage is due to different net salvage allowances used, though there is some effect of the service life over which different salvage allowances are recovered. The reserve deficiency amortization change is a function of several factors, including increases due to base accrual rates and net salvage.

In Schedule LWL-3, I have broken the increase (decrease) proposed by Staff into two components. One is the change in base accrual rate (service life), and the second is elimination of the allowance for net salvage incorporated in the existing rate.

Q. Based on your examination of Schedule LWL-3, what are the issues between you and Mr. Adam?

A. There are surprisingly few. My recommended depreciation expense rates result in an overall increase in depreciation expense from the level currently approved by the Commission of about $6.0 million (exclusive of SLCC). This increase can be broken down into the following components:

Increase in Base Rate (Service Life)	\$5.0 million
Reduction in Net Salvage Rate	(0.6)
Amortization of Reserve Deficiency	1.6
Total	\$6.0 million

Of the above, approximately \$2.3 million is attributable to my recommended increase in depreciation rate applicable to SLCC over the level currently in effect applicable to State Line Unit 1. Mr. Adam, on the other hand, proposes a \$6.8 million reduction to current depreciation expense rates (exclusive of SLCC). However, taking into consideration the net salvage which Mr. Adam suggests be expensed, the net reduction proposed by Mr. Adam amounts to \$7.6 million. This net reduction can be broken down as follows:

Reduction in Base Rate	\$4.2 million
Eliminate Allowance for Net Salvage in Existing Rates	\$3.4 million
Total Reduction in Depreciation Expense	\$7.6 million
Net Salvage Expensed	(1.1)
Net Decrease	\$6.7 million

Of the \$6.7 million decrease in annual depreciation expense (including Mr. Adam's proposed amount of net salvage to be expensed), \$0.7 million is attributable to the reduction in depreciation expense rate Mr. Adam proposes for SLCC from the level currently being charged State Line Unit 1. While there is an extremely large difference (\$6.0 million plus \$6.7 million = \$13.7 million) between my recommended level and Mr. Adam's recommended rates, the issues are relatively few. The \$9.2 million difference (\$5.0 million plus \$4.2 million) in base rates can be summarized as follows:

	Company Proposed Increase $ million	Staff Proposed Increase (Decrease) $ million	Difference Company over Staff $ million
Production Plant			
Asbury Plant	1.9	(0.5)	2.4
Riverton Plant	0.5	(0.1)	0.6
Iatan Plant	0.0	(0.6)	0.6
Other Production	1.0	(1.0)	2.0
SLCC	2.5	(0.6)	3.1
Total Production	6.0	(2.7)	8.7
Transmission-OH Conductor	(0.0)	(0.2)	0.2
General-Computer Equipment	0.4	0.3	0.1
Other	(1.3)	(1.5)	0.2
Total	5.0	(4.2)	9.2

Accounting Treatment of Net Salvage

Q. Do you have any general comments regarding Mr. Adam's proposed treatment of net salvage?

A. Yes, I do. Mr. Adam has structured his testimony in a manner which intertwines two separate and distinct issues. As a result, he does not present the reader with a clear delineation of a recommended change in utility accounting on the one hand, and of the manner in which an allowance for net salvage is estimated on the other.

Q. Can these two issues be separated?

A. Yes. The level of net salvage to be recovered from current customers can be essentially the same regardless of whether net salvage is directly charged to expense or charged to expense through depreciation. Mr. Adam knows this as demonstrated by the quotation at Page 14 through 16 of his direct testimony to the June 8, 2000 Black & Veatch Report regarding Missouri Gas Energy (MGE).

Q. Please define "net salvage" as you use this phrase.

A. Net salvage is the salvage value of the property retired less cost of removal. This definition is the same as in the November 10, 1980, National Association of Regulatory Utility Commissioners (NARUC) Glossary of Depreciation Terms where:

> Gross Salvage represents the amount received for property retired, if sold or reimbursed, or the amount recorded if retained for reuse, and
>
> Cost of Removal is the cost of demolishing, dismantling, tearing down, or otherwise removing retirements of property and equipment, including the cost of related transportation, handling, and restoration.

Q. What are examples of these values?

A. Examples of salvage value (gross salvage) for an electric utility are sales of scrap metal from conductors and salvage values recorded for reuse of poles removed from service. An example of cost of removal (cost to retire) for electric utilities is the labor charges associated with physically removing a pole and preparing it for sale or return to inventory.

Q. In his testimony, Mr. Adam quotes a number of sources to support his proposed treatment of salvage. Do you agree that these quotes support his treatment?

A. No, I do not. Mr. Adam quotes a number of sources which he believes support his proposed change in accounting treatment of net salvage. To reach the conclusions he has presented, Mr. Adam employed some creative reasoning.

Q. What conclusions, if any, do you reach from a review of the cited publications?

A. Based on my reading of these same quotations and other information set forth in the publications quoted, I find that Mr. Adam's reasoning is flawed. As a result, the quotations Mr. Adam presents cannot be used as a definitive basis to support his claim.

Q. Do you have any examples of Mr. Adam's errors?

A. Yes, for example, the unreasonableness of Mr. Adam's reasoning is evident at Page 5, Line 5, where he refers to a "depreciation consultant" and an attorney suggesting a net savage calculation based on "tradition." He follows by structuring two inane examples (one of working wives and the other of one-room schools) of changing traditions in society on Page 4 and Page 5. He suggests these examples support his view that the Commission should adopt his approach. He concludes on Page 5, Line 8, with "Many traditions have been stopped in the past few decades as our society changes."

The fact that there have been innumerable societal changes over the past million or so years of human existence, is irrelevant to whether accounting systems and conventions developed specifically for rate regulated utilities should be thrown out much like the "baby with the bath water." Because Mr. Adam is so concerned that a mathematical formula be strictly followed to measure the allowance for net salvage, he fails to distinguish between fundamental accounting treatments and how one might reasonably forecast a level of net salvage without abandoning the accounting conventions established specifically for rate regulated utilities. These are two separate issues.

Q. What is Mr. Adam's proposed treatment of net salvage?

A. Mr. Adam proposes to remove consideration of net salvage in depreciation and to instead charge net salvage as a current expense.

Q. Should this approach concern the Commission?

A. Yes. The Commission should be wary of his proposal to expense net salvage on a current basis as compared to its historical practice and the current requirement that an allowance for net salvage be included in depreciation rates and that actual salvage be credited and actual cost of removal be debited to accumulated depreciation.

Q. What is the Commission requirement to which you refer?

A. The FERC Uniform System of Accounts (CFR Part 101), which has been adopted by the Missouri Public Service Commission in Rule 4CSR 240-20.030, requires that cost of removal and salvage be charged to depreciation reserves. Paragraph 10B.(2) of the Electric Plant Instruction requires that "when a retirement unit is retired . . . the cost of removal and the salvage shall be charged or credited as appropriate, to such depreciation account." The Commission's regulations require electric utilities to maintain their books and records in compliance with the Uniform System of Accounts.

Q. What would the administrative impact be on Empire if the Commission ordered that Empire adopt Mr. Adam's proposal?

A. At a minimum, Empire would be required to maintain two sets of books, one addressing the FERC Uniform System of Accounts requirements and the other addressing Missouri Commission requirements.

Q. Please explain in greater detail your understanding of Mr. Adam's proposal.

A. Mr. Adam proposes that Empire discontinue its practice of charging salvage and cost of removal to depreciation reserve. He proposes that cost of removal less salvage be expensed. Instead of incorporating consideration of salvage and cost of removal in depreciation expense rates, he proposes that such allowances be eliminated from depreciation expense, with a separate allowance based on five years actual historical experience included in revenue requirements.

Mr. Adam further suggests that final retirements associated, for example, with the retirement of a power plant be amortized over an unspecified period. He, however, fails to specify details regarding his proposal. He does not address such questions as whether Empire would be permitted to earn a return on the unamortized portion and whether reasonable assurance can be made that Empire in fact will be able to recover such amortized costs from rate payers who may not have benefited from the retired property .

Q. Would implementation of Mr. Adam's proposed treatment of savage and cost of removal present significant problems?

A. Yes, it would, particularly with respect to the final retirement costs (i.e., final net salvage). Mr. Adam's proposal can result in major intergenerational subsidies. Under his proposal, the ratepayers who have use of the plant over its lifetime (cost causers) will not pay for the cost of removing the plant. That cost will be deferred to either future ratepayers, or the Company will be forced to absorb such costs. The ratepayers who will ultimately pay for the cost of removal (or benefit from salvage) in their electric rates will not have benefited from the plant which has been retired and with which the cost of removal is associated. This intergenerational subsidy is not only inequitable but also flies in the face of the Commission's used and useful standard.

Q. Is it important that net salvage be included in depreciation rates?

A. Yes.

Q. Why?

A. There are a number of reasons, foremost of which is to accurately reflect the cost to serve utility customers over the used and useful life of the utility property being depreciated. This concept is very explicitly discussed in the 1989 publication, <u>An Introduction to Net Salvage of Public Utility Plant</u>, prepared by the Depreciation Committee, American Gas Association, and Depreciation Accounting Committee, Edison Electric Institute where they state:

> Why the concern for salvage and cost of removal? Because they are costs that must be recorded for financial statements to be meaningful and they are elements of the cost of service to the customers. The cost to retire a unit of property is just as much a capital cost as are the initial in-service costs and the periodic improvements. Cost of removal is a misnomer in some instances, such as at the retirement of gas services and gas mains. Mains and services are retired, but they are seldom physically removed. Instead, they are retired in place. Even though they are retired in place, there are

> significant costs involved in retiring them, and therefore, a more appropriate term would be cost to retire.
>
> The depreciation rate, whether it be based on whole life or remaining life, includes net salvage as without it there is not a fair allocation of costs over time. Intergenerational inequity results if net salvage is not accurately reflected in the depreciation rate.
>
> If net salvage is negative, the depreciation accrual should property reflect this. If it does not, the accumulated provision for depreciation will be deficient at the time of retirement.

Q. At Page 7, Lines 12 through 21, Mr. Adam suggests "including net salvage cost in the reserve account" results in "a theoretical calculation of the reserve account" that "can be significantly larger than a theoretical calculation of the reserve account if only original plant is included in the calculation." Do you agree with this conclusion?

A. Certainly, provided net salvage is negative. In fact, that is the intent. The intent is to recover net salvage over the useful life of the asset. In contrast, the impact of Mr. Adam's proposal is to recover net salvage after the asset is retired and no longer useful.

Q. Does recovery of net salvage through depreciation expense involve some theoretical calculation?

A. No, it does not. It does require some estimation of future costs. I believe the need for reviewing the forecast of such amounts is one reason for the Commission's periodic (every five years) review of depreciation rates. I would note that the Commission's requirement is similar to the recommendation that we normally include in our depreciation expense rate studies that rates be reviewed every three to five years. (See Schedule LWL-1, Page i, middle of first paragraph.)

These reviews provide a vehicle to adjust over time variances between forecast and actual results. The 1989 net salvage text confirms this view stating:

> To allow for these costs over the life of an asset, there must be an effort to make accurate salvage and cost removal estimates. However, a perfect current salvage and cost of removal estimate now for properties to be retired in 5 to 50 years is impossible. The logical alternative is to make periodic re-estimates throughout the life cycle to minimize the variance between actual and estimated net salvage. By periodically reviewing and revising estimates, any changes in market prices or labor costs can be more accurately reflected.

Q. At Pages 8 through 10 of his direct testimony, Mr. Adam expresses concern for utility customers regarding "pre-collection of a future unknown estimate that includes inflation" if an allowance for net salvage is included in depreciation rates. Are utility customers paying more than they should because of the inclusion of allowance for net salvage in depreciation rates?

A. No, they are not. Mr. Adam's statement and his subsequent suggestions at Page 10 that companies:

- "do not propose an adjustment to the current collections that include the embedded inflation factor"
- "do not point out that they are proposing a pre-collection of a future unknown estimate that includes inflation ".
- "do not propose that an internal rate of return factor be applied to the pre-collected net salvage cost"
- "do not propose to pay the customers for the use of the pre-collected monies"

demonstrate conclusively to me that Mr. Adam does not understand fundamental utility accounting and rate making principles.

While I may not agree with every aspect of utility accounting practices or original cost rate making, there is a genius with certain interrelationships. Customers are fully and completely compensated for customer provided funds between the time depreciation is booked and the time when plant is retired and funds are ultimately expended for cost of removal (net of salvage). This is because to the extent that depreciation recovers monies for net salvage in excess of that incurred in a year, that amount results in an increase in depreciation reserve, an amount which can be considered to be a reserve to cover future cost of removal (net of salvage). Since original cost is reduced by reserve to determine rate base, customers are compensated by the cumulative amount collected (in excess of actual expenditures to date) times the rate of return (generally before tax rate of return). To the extent circumstances change over time, and ultimately the cost of removal allowance in depreciation expense rates exceeds that which is actually expended, customers continue to be compensated until depreciation is adjusted and any excess reserve is returned through reduced future accruals.

Q. Does this result in the intergenerational subsidies you referred to earlier?

A. Yes, it does. To the extent that net salvage allowances exceed or are less than that which will ultimately occur, future customers will either subsidize or be subsidized by existing customers. The possibility of such a subsidy, regardless of which direction it goes, is one reason why it is important to include reasonable estimates of net salvage in the development of depreciation expense rates.

Q. Why should this question be significant to the Commission?

A. Utility plant investment accounting is an integral part of regulated utility rate making principles. If one deviates from utility plant investment accounting, such as proposed by Mr. Adam, regulated utility rate making models start to come unraveled. Utility plant investment depreciation practices provide the means for utilities to recover the capital investment in utility property including the net salvage cost during the time the property is in service from customers who receive the service provided by those properties. If the net salvage portion of the recovery of invested capital is only recognized at the time of retirement, the customers who have benefited from the service provided by the property during its service life will not have paid the full cost of providing the service they have received. Rate making principles also allow regulated utilities to earn a fair return on invested capital. The rate base upon which utilities are allowed to earn a return is predominantly plant in service less accumulated provision for depreciation. Recognition of net salvage in depreciation rates is properly reflected in the determination of rate base in each rate case.

Q. In your prior responses, you indicate the need to include reasonable estimates of net salvage in the development of depreciation expense rates. Can you elaborate on what you mean by reasonable estimates?

A. Yes, I can. I believe that reasonable people can disagree with the level of net salvage which will be incurred at the time utility plant is removed from service. This disagreement can be in whether the principle consideration in determining whether future net salvage is the relationship between historical net salvage and retirements (as a percent of original cost retired) or as a relatively fixed annual amount, or something in between. For example, reasonable people may disagree with one believing net salvage incurred in retiring existing plant will amount to a negative 25 percent of original cost while another believes a more reasonable value is a negative 10 percent.

Mr. Adam and I, however, differ by much more than what I consider a reasonable difference. I believe that for most electric utility property, interim and final net salvage (whether positive or negative) will result upon retirement. I believe that reasonable capital recovery (including salvage and cost of removal) can only result if all implications incident to the property, its life, and its retirement, are reflected in the development of depreciation expense rates for recovery over the life of the plant being depreciated.

Mr. Adam proposes an approach which ignores the real world (salvage and cost of removal of aboveground facilities) by limiting recovery to that which has occurred in connection with the retirement of plant no longer in service. He includes no provision to charge customers for the cost of removal, net of salvage, which will ultimately occur in connection with the plant that customers are actually using today.

In short, the allowances I recommend may be somewhat higher or lower than what will ultimately occur. Mr. Adam's proposal, on the other hand, is to reflect salvage and cost of removal allowances which, based on current information, is most certainly deficient.

Q. Mr. Adam suggests that Staff depreciation engineers and accountants will propose an amortization to allow the Company to recover the appropriate amount from customers for major plant retirements at the time of the of the plant's removal. Do you agree that this is the proper methodology?

A. No, I do not. This treatment results in a direct intergenerational subsidy of existing ratepayers by future rate payers (assuming cost of removal exceeds salvage). This is not only unfair and unjust, it also violates the basic concept of depreciation.

Q. Please explain.

A. Quoting from the 1996 NARUC, Public Utility Depreciation Practices, under the subheading "Regulatory Considerations," Page 23, the text states:

> It is essential to remember than depreciation is intended only for the purpose of recording the periodic allocation of cost in a manner properly related to the useful life of the plant. It is not intended, for example, to achieve a desired financial objective or to fund modernization programs.
>
> As pointed out earlier in this chapter, the depreciation expense reflected in the numerator of the rate of return calculation is almost always developed under the cost allocation concept. Consistency between numerator and denominator is easier to achieve, or at least easier to demonstrate, if the rate base is also developed under the same concept.

Q. In the preceding, you seem to suggest that cost of removal will exceed salvage in connection with the retirement of existing plant. Do you believe that this will be the case?

A. Yes, I do. Again, the Commission's periodic five-year review of depreciation rates can equitably compensate for estimation changes over time. Quoting from the 1989 net salvage text:

> Prior to 1960, electric utilities were typically recording positive net salvage values (gross salvage exceeded cost of removal). With the onset of increasing inflation, labor costs rose significantly resulting in increasingly high cost of removal. Gross salvage was not affected by these increasing labor costs and, therefore, net salvage values became more and more negative. There does not appear to be anything in the foreseeable future which will affect this trend toward increasingly negative net salvage.
>
> Electric generating stations are good examples of how the trend from positive to negative net salvage has occurred. The older stations consisted of smaller equipment which could be more easily removed and shipped to the used equipment buyer. The requirements for handling and disposal of such wastes as asbestos were more costly considerations to be accounted for in the removal of such a facility. For instance, not only is it more difficult to remove such a facility because of the type, design and extent of the equipment, but also contaminated equipment and structures must be removed with special procedures. In addition, there are very specific regulatory guidelines which must be adhered to when decommissioning a nuclear facility and handling of asbestos [in fossil plants]. These regulations add significantly to the cost to retire. In the same vein, safety regulations must be adhered to by the gas companies in the retirement of gas mains and services, which also greatly increase retirement costs.

Q. Mr. Adam quotes from the NARUC text on Page 11 of his direct testimony for the principle that the traditional whole life formula is based on the premise that property ownership includes the responsibility for the property's ultimate abandonment or removal. He then refutes NARUC's statement by pointing out that when property is sold, the ultimate abandonment or removal is transferred to the new owner and therefore, the collections for future abandonment or removal recovered under the traditional formula were not utilized. Do you agree with his conclusion?

A. No, I do not. When utility assets are sold (absent specific assignment of the liability to the seller), usually the liability of costs of removal and the benefit of net salvage flow to the new owner. The seller does not avoid cost of removal since the sales price of the asset reflects consideration of the value added by salvage and the added cost of removal, which the buyer will ultimately incur.

Q. Mr. Adam states on Page 18, Line 3 through 6, that "only commissions with depreciation engineers on staff that recognize the large difference between 'traditional' net salvage determinations and current net salvage cost can be expected to be considering ordering net salvage cost on a current expense basis." Do you agree with Mr. Adam's statement?

A. No, I do not. I don't believe that simply being hired to be a "depreciation engineer" and having a title of "depreciation engineer" warrants a person to be an expert on depreciation and depreciation accounting.

Net Salvage Allowance

Q. Beginning on Page 14 of his direct testimony, Mr. Adam refers to a depreciation study submitted by Missouri Gas Energy (MGE). Are you familiar with that study?

A. Yes, I am.

Q. Is your treatment of net salvage in this case different from that set forth in the MGE report?

A. No, it is not. A reading of Mr. Adam's testimony would lead one to believe that Mr. Sullivan's (the primary author of that report) and my treatment differ and that Mr. Sullivan and I have no knowledge of what the other is doing. Nothing could be further from the truth. Mr. Sullivan has worked directly for me since about 1982. He and I discussed the problems and the issues which lead to the net salvage allowance he included in the MGE report. I read and commented on a draft copy of the report before it was finalized.

Q. Did you examine the reasonableness of the concept underlying Mr. Sullivan's treatment in the MGE report as it might apply to Empire?

A. Yes, I did. I specifically rejected its use because it fails to consider current and reasonably forecast salvage and cost of removal practices of electric utilities.

Q. Do you believe Mr. Sullivan's proposal with regard to MGE to be reasonable?

A. Yes, I do. I believe that the allowances used by Mr. Sullivan are reasonable at the present time for MGE.

Q. Do you believe that it would be reasonable to apply the approach used by Mr. Sullivan in the MGE report to Empire's electric utility property?

A. No, I do not. For the very reasons that Mr. Sullivan's approach is reasonable for MGE, it is unreasonable for Empire.

Q. Please explain.

A. First of all, I have been perhaps a little sloppy in terminology. I determine what I consider a reasonable allowance for net salvage to be recovered through depreciation rates not a specific approach or method. I use some historical relationships as a consideration in determining what a reasonable allowance might be.

With regard to Mr. Sullivan's "approach" relative to mine, at the present time, the standard practice of many gas utilities (including MGE) is to abandon underground property in place. By abandoning property in place, there is no salvage or cost of removal (though there may be some "cost of retirement") associated with final retirements. Since so much of the investment cost of gas distribution systems is underground[1], the assumption that there will be no final net salvage cost is reasonable for the purpose of the development of depreciation expense rates.

In this regard, Mr. Adam failed to point out that Mr. Sullivan limited the "nontraditional approach" to distribution property only. With regard to general plant, Mr.

Sullivan includes an allowance for net salvage which includes net salvage associated with final retirements by using what Mr. Adam refers to as a "traditional approach".

Electric utilities generally do not have a significant portion of their facilities underground. While one might argue that the minor amount of underground facilities[2] will be abandoned in place, the bulk of an electric utility's property is aboveground and at some point must be physically removed. One cannot reasonably assume that an electric utility can abandon power plants, transmission lines, and distribution lines without some requirement to physically remove the equipment. Abandoning their overhead property in place would present considerable safety risk to the public and the environment and would most likely meet with legal opposition in the communities they serve. The assumption implicit in Mr. Adam's proposal is simply unreasonable as it applies to electric utility property.

My treatment of net salvage considers both interim and final retirements of property. While some historical data exists as a basis for predicting interim removal and salvage costs for mass property and to a lesser extent for production property, historical data which might be used to predict final retirements is relatively unavailable. Mr. Adam implies on Page 7 that this lack of data results in a "theoretical" calculation adjustment to depreciation rates. I disagree. To not include the cost of final retirements in the development of depreciation rates fails to recognize the societal obligation of electric utilities to remove plant at retirement as opposed to abandoning in place.

Q. How does Mr. Adam's proposed net salvage differ from yours?

A. Mr. Adam proposes an equivalent net salvage allowance exactly equal to the average experienced over the past 5 years. I propose a net salvage allowance based on a reasonable

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[1] For MGE over 75% of its investment is related to underground mains and services.

[2] For Empire, less than 4% of its investment is related to underground conduit and conductor.

estimate of what I anticipate will occur in connection with the prospective retirement of Empire's existing property. In developing my estimate, I examined retirement history and associated salvage and cost of removal from 1969 through 1999. In this regard, I examined actual annual experience (dollar amount) as well as the relationship of salvage, cost of removal, and net salvage to retirements. Based on these examinations, I included an allowance based in large part on recent experience and which generally falls somewhere between the range of actual annual experience and the relationship between net salvage and retirements.

Mortality Curve Analysis

Q. Of the $9.2 million difference between the Company's and Staff's recommended base rates you identify in Schedule LWL-3, over $8.7 million relates to production plant. What accounts for this significant shift?

A. This extremely significant difference is due to two fundamental differences between how Staff proposes to calculate depreciation rates applicable to production plant and my approach. One difference relates to Mr. Adam's failure to distinguish between the controlling characteristics of unit (life span) property versus mass property. The second relates to Mr. Adam's failure to recognize the implications of interim additions and replacements which have actually occurred and which are forecast to occur over the life of the facility.

Q. Does Mr. Adam recommend rates for production property which are developed in a consistent manner?

A. No, he does not. For SLCC, Mr. Adam proposes to develop depreciation (absent consideration of net salvage) in the same manner which I use for all production property. The difference between my depreciation rate for SLCC and his (again absent net salvage) relates solely to my consideration of interim additions and retirements and Mr. Adam's complete and total failure to consider the implications of interim activity.

Mr. Adam proposes to use a different approach for plants other than SLCC. The approach he follows for other plants is to use average service lives based on retirement history. The average service life approach he follows fails to distinguish between the inherent mass and unit (life span) property differences.

Q. How does Mr. Adam fail to distinguish the difference between mass and unit property?

A. Mr. Adam proposes to develop service lives and depreciation rates for Empire's power production facilities (unit property) in the same manner as mass property accounts.

Q. What is the difference between unit and mass properties?

A. Unit properties are generally characterized as an assembly of heterogeneous property elements which are combined in order to meet a specific purpose. Unit property usually consists of some critical elements which, if not capable of operating, limit the capability of the plant. One of the best examples of a unit property is a power plant (or individual generating unit). A power plant consists of a collection of pumps, valves, piping (high to low pressure, high to low temperature, high to low capacity), water treatment and waste disposal facilities, fuel handling, steam generation, electric generation, turbines, etc. During the life of a plant, some of these elements will be replaced or extensively repaired or maintained. However, since these components are integrated, at some point they will be retired as a group. All of the elements which comprise the plant will be retired when it is no longer economical to repair and replace, for example, the boiler feed pump because the life of other critical components (perhaps the high pressure steam piping) limits the economics of replacing the pump.

Mass property, on the other hand, represents more homogeneous pieces of property which are usually somewhat interchangeable, and generally in large number. While the system of which a mass property element is a part generally requires the performance of each element, the life span of other elements of property which are part of the system is not dependent upon the life of the individual components. Poles, conductor, line transformers, and meters are excellent examples of mass property.

Q. Are actuarial methods a reasonable approach for estimating service life for determining depreciation rates for electric production plant investment property accounts of the Company?

A. No, they are not.

Q. Why are the actuarial methods that you employ to estimate service life and determine depreciation rates for mass property plant accounts not a reasonable approach for determining service life and depreciation rates for production plant investment?

A. Actuarial methods are often useful for analyzing historical life characteristics of plant accounts having a relatively long history and a continuous pattern of additions and retirements of similar units. They are not useful for analyzing accounts with a small number of large, dissimilar units and relatively few retirements of complete physical units of property. Actuarial methods do not provide a reasonable estimate of service lives for investment in the various accounts that are associated with individual production plant units. Service lives of individual production plants, which often include multiple generating units that are added to the location over time, are influenced by many factors not related to normal retirement dispersions of equipment included in the various property accounts that make up a production plant.

Q. You say that actuarial methods applied to production plant investment do not produce reasonable estimates of service life. Can you demonstrate why this is true in this case?

A. Yes, I can. Staff, in this case, relies upon a depreciation study completed for Case No. ER-94-174 as the basis of their proposed depreciation rates for production investment. The plant investment data used in that 1994 study was identified by account but not by individual plant. Referring to Staff Schedule 1-1 in this case, Staff has proposed the same service life and depreciation rate for each production account for all production plants. This is not reasonable for the Company's production investment. Each plant has unique characteristics consisting of varying units of property constructed at non-uniform intervals which will ultimately be retired when management finds the generating units uneconomical, not at the end of the physical life of the individual property units.

As an example, Mr. Adam suggests an average service life of 95 years for structures and improvements and 54 to 63 years for other steam production accounts. In reality, the investment life of structures at any production plant location will be not be greater than the span of time between the installation of the first unit at a plant and the final retirement of the last unit at that plant. None of the Company's production plants are scheduled to be in service for 95 years. No one can realistically assume that for example, the structure of the Asbury plant will be useful beyond the life of the boiler. Yet this is the assumption implicit in Mr. Adam's recommendation.

Q. What is a reasonable approach to making determinations of service lives and depreciation rates for the Company's production plant?

A. The whole (or remaining) life accrual analysis for each production plant, by account, produces a reasonable basis for estimating depreciation rates applicable to the Company's production investment. The whole life accrual rate is defined as the rate which, when applied to annual depreciable plant balances, will result in recovery of investment (plus cost of removal and less salvage) over the entire life of the property.

Q. Does the whole life accrual method require forecasts of future investment?

A. No, it does not. I will discuss treatment of interim investment later in my testimony. The future is uncertain but current plans for the future need to be reflected in depreciation rates to produce reasonable results for each production plant. Depreciation rates by property accounts that are the same for different generating plants, as in Mr. Adam's approach, do not recognize differences between individual production plants. Actuarial analysis, of itself, does not recognize planned future retirement dates. The whole life approach that I use gives recognition to the investment history, the forecast retirement date for each generating unit, and the net salvage at that date. As I will describe subsequently, I also recognize the implications of interim additions and retirements to the date or retirement, and the net salvage associated with interim retirements. If depreciation rates are examined every five years, the whole life analysis will recognize plant history by unit, reflect current planning with each study and adjust depreciation rates reasonably.

Q. Staff has relied upon a study from Case No. ER-94-174 because of a problem Mr. Adam perceives with current data. Why are you able to analyze the production property in the current case if there is a problem with production plant data?

A. Prior to 1993, the Company maintained production plant vintage data by FERC account but not identified by specific plant. Therefore, the data required to analyze property accounts by production plant using actuarial analysis does not exist. Even if the data were available, actuarial analysis is not particularly helpful for analyzing accounts with small numbers of large, dissimilar property units and relatively few retirements of complete physical units of property. The problem is that actuarial analysis of these accounts does not provide reasonable, realistic service lives for individual production plants whose ultimate service lives are determined primarily by economic factors, not physical factors. The whole life accrual analysis that I employ does not rely upon vintages of retirements but rather upon the end of period plant balances by plant by account. This information is, and has been, available for all Company plants from the date of the initial unit.

Q. Staff proposes that the Company be ordered to provide certain data, based upon Commission Rule 4 CSR 240-20.030, by July 1, 2001. If it is possible to comply with such an order were it to be issued, would having this information affect your analyses and findings in any way?

A. No, it would not. And, given the fact that the information by plant and unit does not exist prior to 1993, I doubt that having the currently inaccessible information for the period between 1994 and 1998 would affect the Staff's analyses and findings either. As I stated previously, the Company's production investment, even if all of the needed vintage retirement data existed, would not produce reasonable results when analyzed by actuarial analysis.

Q. On Page 25 of Mr. Adam's direct testimony, beginning at Line 9, he states that the amortization [referring to the adjustment in the Company's base accrual rate to recognize reserve for depreciation surpluses and deficiencies] "is proposed as an adjustment for a theoretical reserve balance calculation done by the consultant. The data files necessary to actually calculate a theoretical reserve balance are not available. Thus the consultant's theoretical calculation is suspect." Does the whole life accrual analysis that you employ to determine reasonable depreciation rates for the production plant of the Company allow you to determine reasonable reserve balances?

A. Yes, I determined an exact "theoretical" reserve balance for each production plant by account as of December 31, 1999, based on the difference between the plant balance at that date plus forecast additions and final net salvage (investment yet to be recovered) and the total forecast depreciation accruals (investment that will be recovered) over the remaining life of the production plant. Forecast accruals are based on the whole life depreciation rates adjusted for salvage and cost of removal associated with interim retirements. This difference for each production plant by account is the accumulated depreciation reserve that is required as of December 31, 1999, to fully amortize capital investment over the remaining life of the production plant based on application of my recommended depreciation expense rates.

Life Span Synchronization

Q. How does Mr. Adam support the 2.86 percent depreciation rate for SLCC he recommends on Page 23, Line 12?

A. Mr. Adam supports the 2.86 percent rate by use of a 35-year average service life (ASL). The 2.86 percent depreciation rate he develops is simply 1 divided by a 35-year ASL.

Q. What are the implications of Mr. Adam's development of the 2.86 percent rate?

A. Mr. Adam understates depreciation. He includes no consideration of salvage, cost of removal, or more importantly interim investment in the development of his proposed depreciation rate. Mr. Adam's failure to include consideration of interim investment is especially troublesome since without this investment the life span of the SLCC is considerably less than the 35-year life he uses.

Q. Why is that?

A. Without recommended major maintenance (interim additions), the unit will fail to operate as designed and environmentally permitted.

Q. What are your findings and conclusions regarding the proper depreciation expense rate applicable to the Company's investment in SLCC?

A. Based on the results of my analysis, I find that the whole life depreciation rate applicable to the SLCC facility is 4.99 percent. I use a 35-year plant life and include consideration of the interim investment required in order for the plant to realize this life. In my development of the 4.99 percent rate, I also include an allowance for salvage and cost of removal.

Q. On Page 23, Lines 3 through 8, Mr. Adam states that Staff relied on design engineers to determine the 35-year plant life for SLCC. What are your concerns with this approach?

A. I have mixed concerns since I believe the 35-year plant life is relied upon out of context. The design engineer Mr. Adam refers to is the Black & Veatch principal-in-charge of the SLCC project, Mr. Kermit Trout. Shortly after Mr. Trout spoke with Staff, he contacted me and informed me of his conversation and its substance. I was surprised by Mr. Adam's testimony suggesting that a design engineer expressed an unqualified opinion regarding the design life of a power plant. In fact, retired engineers who designed power plants throughout their professional careers have expressed to me that "design life" is not something they or utilities "designed to."

Q. What was the substance of Staff's conversation with Mr. Trout?

A. Staff's Ms. Schad contacted Mr. Trout on March 9, 2001 to discuss plant life. He confirmed a 35-year plant "design" life with the caveats that the plant is subject to reasonable use and prudent maintenance. He also mentioned that Empire's plants had a history of longevity since they very diligently maintain their equipment. My concern with the Staff's use of a 35-year life is the fact that this life is not realistic without consideration of appropriate maintenance.

Q. Does Mr. Trout's response support your inclusion of interim additions in the development of depreciation rates applicable to production plants?

A. Yes, it does. Mr. Trout's reference to maintenance supports the inclusion of the consideration of the affect of interim additions. In my Schedule LWL-2, I show the operation and maintenance forecast for SLCC which I understand was prepared under Mr. Trout's general supervision. The interim additions I sponsor and incorporate in my recommended rate are based on capitalizing certain of those major maintenance costs, using proper accounting standards.

In short, had Ms. Schad's query of Mr. Trout been more fully developed, Mr. Adam's conclusion would be that a 35-year plant life can not be achieved without a reasonable level of interim additions.

Q. Prior to your discussion with Mr. Trout earlier this year, had you discussed the life characteristics of combustion turbine based generation with him?

A. Yes, I had. In 1994, Mr. Trout inquired of me about what a reasonable life would be. At that time I informed him that an average service life for combustion turbine based capacity is on the order of 35 years.

Q. Going back to Mr. Adam's concern about "tradition," have practices changed which affect the need to reflect interim additions in the development of depreciation rates?

A. Yes, practices have changed, especially with respect to combined cycle generating units as contrasted with vintage generation.

Q. Please explain.

A. Historically, generating assets were designed and constructed with primary consideration given to reliability and operating performance. Cost was a secondary consideration. Today, the primary concern is to minimize construction cost, with reliability a secondary consideration. The old adage that "they don't make them like they used to" is very applicable to generating assets. The fact that "they don't make them like they used to" does not mean that vintage plants are better than plants being constructed today, it means that they were constructed differently.

Today's concern with cost is manifest by trading off initial construction cost with much higher maintenance cost over the life of the generating plant. These higher maintenance costs are generally in the form of increased levels of interim additions and replacements.

Q. What are the implications of interim capital expenditures?

A Interim capital expenditures are required in order for generating units to achieve minimum life span. Unless capital expenditures incurred over the entire life of the plant are considered in the development of depreciation rates, annual depreciation charges during the early years of the plant are understated with corresponding overstatement in the latter years. An alternative to explicit recognition of interim capital expenditures is to recognize in the depreciation analysis the substantially shorter life span that would result if interim capital expenses are not made. This applies to all generating units not just SLCC.

Q. Why do interim capital additions lead to increasing depreciation rates over the life of a combined cycle production plant?

A. For depreciation purposes, a production plant is assumed to have some fixed life span. For example, in Schedule LWL-1, I generally use a 45-year life for coal-fired generation and a 35-year life for combustion turbine based generation (including SLCC). Capital additions and replacements must be made during this period—not to extend the life span but simply to achieve it. As these capital additions are made over the course of the plant life span, they must be recovered over increasingly shorter periods. All else being equal, failure to recognize interim investment results in a steadily increasing depreciation rate.

Q. What is the importance of interim capital expenditures?

A Without significant interim capital expenditures for renewals, replacements, and environmental compliance (along with major O&M expenditures), complex systems such as combustion turbines and combined cycle and steam plants would operate at best for a few years. Operation of complex generating equipment requires significant capital expenditures to keep the plant operating over its life. In this regard, a generating station is no different than my car. This is much like the wear of brake pads, which, if not replaced, will eventually lead to the inability to stop my car and potentially more severe damage. For combustion turbines, compressor blades and burner nozzles will wear to the point where natural gas cannot be efficiently fed through the machine to continue to run the plant. More importantly, perhaps long before the plant cannot run because natural gas cannot be fed into the turbine, environmental violations may have occurred as a result of attempting to burn gas inefficiently. Capital expenditures for environmental compliance have been and may continue to be significant. Without needed environmental expenditures, the plant will be required by law to cease operation or operate at substantially reduced output.

Q. In your development of depreciation rates in this case, did you include any allowance for future additions required in order to meet environmental requirements?

A. No, I did not. I reflected all actual expenditures to date, environmental and otherwise. However, my forecast interim additions and retirements reflect only consideration of "routine" activities required for the plant to achieve its forecast life.

Q. Do these interim capital additions have implications for the reasonableness of depreciation rates?

A Yes, they do. Capital investment is routinely made subsequent to the original construction of a plant. This is significant for combustion turbine based plants which have lower initial capital cost and higher maintenance expense (interim additions) than traditional fossil-fired steam plants. This investment does not increase the expected life of the plant. The need for this investment is to permit continued operation. This investment is required in order for the plant to achieve the expected life. In this situation, depreciation rates based on the expected total life of the original investment will not recover the investment required in order for the expected life to be realized, since investment added to keep the plant running will have increasingly shorter periods over which to be recovered. If the investment of net capital additions is to be recovered over the remaining life of the plant, depreciation rates must recognize that significant amounts of future investment will have shorter lives than the original investment required to place the plant in service.

Q. How should interim additions be reflected in depreciation rates?

A Interim additions can be reflected in depreciation expense rates in one of two ways. First, they can be ignored until they actually occur. By ignoring interim additions until they occur, depreciation rates will increase over the life of a plant. This is exactly the treatment underlying Mr. Adam's recommended rates. Failure to recognize these interim additions results in the dichotomy of a depreciation expense which increases over time related to an asset whose benefit generally tends to decrease over time.

The alternative is to reflect anticipated interim additions in the calculation of depreciation rates over the life of the plant. This can be done in two ways. One is to include in the calculation of depreciation rates an allowance for the costs and timing of interim investment over the expected life of the plant. The second is to recognize that the expected life of the plant is reduced substantially if these additions are not made. In either event, depreciation rates are calculated in a manner which reasonably attempts to match recovery of investment over the life of the asset provided by the investment.

Q. Have you prepared a schedule which demonstrates this point?

A Yes, I have. Schedule (LWL-4) consists of three pages and presents a simple example of the impact of interim additions on depreciation rates over the life of an asset. Columns [A] through [E] of all three pages are identical. In these columns, I present forecast plant activity over a 35-year life span.

The purpose of Schedule LWL-4 is to illustrate a concept. I therefore assume in my example that there is no change in the original $1,000,000 investment over the 35-year plant life. I do assume that over the 35-year life of the plant, in each year 0.5 percent of investment is retired ($5,000) and replaced. Since the plant is retired in total at the end of the 35th year, I assume no interim additions and retirements in the 35th year.

As can be seen in my simple example, assuming extremely modest additions and retirements, interim capital investment amounts to 17 percent of original installed costs. For SLCC, interim investment as measured by the excess cost of forecast intermediate and major maintenance activities, amounts to $188,322,633 or over 80 percent of original installed cost. As in my Schedule LWL-4 example, I assume no interim investment during the final 7 years of the 35-year life span of SLCC in anticipation of its retirement.

Q. How do these pages differ?

A The derivation of the depreciation rates on the three pages is similar but differs slightly on each page. On page 1, no consideration is given to interim investment until expended. This is the treatment which underlies the rates recommended by Mr. Adam. With no prior consideration given to the interim additions required in order for the asset to realize its life, depreciation rates (and corresponding depreciation expense) increase dramatically over the life of the plant. In my simple example, over the 35-year life, depreciation expense rates increase from 2.86 percent to 4.82 percent. This increase amounts to 72 percent, or 1.6

percent per year. Thus in my example, no increase in investment results in a 1.6 percent increase in depreciation expense and expense rate per year assuming that only 0.5 percent of original investment is retired and replaced each year. This 0.5 percent allowance is about 80 percent lower that that forecast for SLCC.

On Page 2, I present the same information but include (in the calculation of depreciation rate) consideration of the interim investment required in order for the plant to be in service for 35 years. This is accomplished by including an allowance for the amount of future interim additions in the unrecovered investment used to calculate depreciation rates. The remaining life or recovery period is calculated in the same manner as in Page 1. As shown on Page 2, by considering interim additions in this manner, all investment is recovered uniformly (in a straight-line) over the life of the asset.

On Page 3, I again present the same example but include consideration of interim additions by reflecting that the 35-year life cannot be achieved without these replacements. This is accomplished by setting the recovery period in each year so that annual depreciation is uniform over the life of the asset. Once again, the unrecovered investment is calculated in the same manner as on page 1.

Q. On Page 3, you show the recovery period (remaining life) as fractions of a year. Do you suggest that this precision can be introduced into the development of depreciation rates?

A No, I do not. Page 3 of Schedule LWL-1 was prepared and presented to illustrate a concept, not as a practical application.

Q. You indicate in the preceding, interim investment needs to be reflected in the development of the appropriate depreciation expense rate. Doesn't this involve some kind of forecast of the future?

A Yes, it does. Although, there is no question that I cannot predict with absolute certainty the level and timing of interim investment, I am absolutely certain that interim additions will be required. I am also absolutely certain as to their impact on depreciation rates. In short, I know with absolute certainty that my result will be more reflective of actual conditions if I include some reasonable consideration of interim additions than if I ignore the real world and include no consideration as Mr. Adam proposes.

I can reflect consideration of these additions by either incorporating an estimate of their timing and costs, or by conservatively estimating life span, or a combination of the two.

Q. What conclusion do you reach based on your examination of Schedule LWL-4?

A In the development of reasonable depreciation expense rates, inter-generational subsidies are introduced if consideration of interim investment is not incorporated. These inter-generational subsidies are manifest by under-charging depreciation expense in the early years of a plant's life and over-charging in its latter years. The implication of not considering interim additions is that the depreciation rate actually charged over the life of the asset is not a straight-line rate but one which increases with age.

In order to avoid this dichotomy, a matching of life span and capital investment over that life span is required. This matching can be accommodated by explicitly recognizing the future cost of interim investment and using a reasonably normal life span or by ignoring future capital investment and using a much shorter life span which corresponds to actual life if no capital additions are made.

Q. If consideration of interim investment is not included in the development of the appropriate SLCC depreciation rate, what life span would be reasonable?

A. Without capital investment, there is little chance that SLCC could run as a baseload unit (or peaking unit for that matter) for more than a few years. However, using this concept, the reasonableness of my recommended 4.99 percent depreciation rate can be evaluated. If we assume a life span for SLCC of 20 years with no interim capital investment, cost of removal, or salvage, the resulting depreciation rate would be 5 percent. A 20-year life absolutely exceeds the actual life of the plant assuming no interim investment is made. I believe this simple example demonstrates the reasonableness of my recommended rate.

Q. Do you have any additional concerns regarding Mr. Adam's testimony?

A. Yes, my over-riding concern is that Mr. Adam's proposals present the Commission with radical departures from past precedents and the production depreciation rate methodologies we have relied upon in this and past cases. This radical change in methodology leaves the Commission little leeway to choose something in between Staff and Company on these issues. If Mr. Adam's proposals were merely calculation differences, there would be opportunity to choose some of the Staff's position and some of the Company's position. If the Commission changes methodology, it will be very difficult to go back to the precedents in place now, if Mr. Adam's proposals prove as inadequate as I believe they are.

Q. If the Commission does not adopt Mr. Adam's proposals on net salvage, final retirements, or treatment of SLCC, will current and future rate payers be harmed?

A. No, absolutely not. Intergenerational rate payer issues will be fairly addressed. More importantly, the Commission's current practice of requiring utilities to submit depreciation rate studies at least every five years provides a sound basis for making calculation, not methodological, adjustments to depreciation rates. Estimated components of depreciation rate analysis, such as net salvage, interim additions, and plant life, can readily be adjusted to revised forecast and actual results to date in this periodic review process. The Commission may also direct the utility to make more fully developed studies of net salvage ratios, interim additions, and final retirement costs to further refine forecasts.

Q. Does this conclude your rebuttal testimony in this matter?

A. Yes, it does.

The Empire District Electric Company
Comparison of Depreciation Rate Recommendations

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]	[L]	[M]	[N]	[O]	[Q]	[S]	[T]	[U]	[V]	[W]	[X]	[Y]	[Z]	[AA]
			Existing					Company Proposal						Staff Proposal				Increase Proposed by Company				Increase Proposed by Staff		
Line No.	Acct. No.	Description	Average Service Life	Net Salvage Ratio	Base Accrual Rate	Net Salvage	Total Rate	Implied Avg. Life	Implied Net Salv. Ratio	Base Accrual Rate	Net Salvage	Reserve	Total Rate	Average Service Life	Base Accrual Rate	Total Rate	Depreciable Plant	Base Accrual Rate	Net Salvage	Reserve Amortization	Total	Base Accrual Rate	Net Salvage	Total Rate
			Years	%	%	%	%	Years	%	%	%	%	%	Years	%	%	$	$	$	$	$	$	$	$
					1/[D]	[E]/[D]	[F]+[G]	(5)	(5)				[K]+[L]+[M]		1/[O]			[[K]-[F]]x[R]	[[L]-[G]]x[R]	[M]x[R]	[U]+[V]+[W]	[[Q]-[F]]x[R]	-[G]x[R]	[Y]+[Z]
1		**Asbury**																						
2	311	Struct. & Improv.	53	-14.00%	1.89%	0.26%	2.15%	22.27	-10.02%	4.49%	0.45%	1.59%	6.53%	95.00	1.05%	1.05%	8,831,444	229,901	16,413	140,420	386,734	(73,668)	(23,328)	(96,997)
3	312	Boiler Plant Eq.	46	-34.00%	2.17%	0.74%	2.91%	20.37	-10.39%	4.91%	0.51%	2.07%	7.49%	54.00	1.85%	1.85%	53,717,466	1,469,757	(123,083)	1,111,952	2,458,625	(173,003)	(397,042)	(570,045)
4	312	Unit Train (3)	15	15.00%	6.67%	-1.00%	5.67%	22.62	9.95%	4.42%	-0.44%	-0.16%	3.82%	15.00	6.67%	6.67%	5,580,297	(125,371)	31,250	(8,928)	(103,049)	0	55,803	55,803
5	314	Turbogen. Units	39	-1.00%	2.56%	0.03%	2.59%	28.01	-1.96%	3.57%	0.07%	0.96%	4.60%	63.00	1.59%	1.59%	19,559,979	196,753	8,677	187,776	393,206	(191,062)	(5,015)	(196,077)
6	315	Acc. Elect. Equip.	52	-8.00%	1.92%	0.15%	2.08%	33.90	3.73%	2.95%	-0.11%	0.02%	2.86%	56.00	1.79%	1.79%	2,328,232	23,909	(6,143)	466	18,232	(3,198)	(3,582)	(6,780)
7	316	Misc. Pwr. Plt. Eq.	45	6.00%	2.22%	-0.13%	2.09%	16.03	2.88%	6.24%	-0.18%	1.40%	7.46%	51.00	1.96%	1.96%	2,709,600	108,866	(1,264)	37,934	145,536	(7,084)	3,613	(3,471)
8		Total Asbury															92,727,018	1,903,815	(74,151)	1,469,619	3,299,283	(448,016)	(369,552)	(817,568)
9		**Riverton**																						
10	311	Struct. & Improv.	55.6	-14.00%	1.80%	0.25%	2.05%	26.25	-9.97%	3.81%	0.38%	4.10%	8.29%	95.00	1.05%	1.05%	8,098,667	162,900	10,383	332,045	505,328	(60,410)	(20,392)	(80,803)
11	312	Boiler Plant Eq.	48.4	-34.00%	2.07%	0.70%	2.77%	29.76	-12.20%	3.36%	0.41%	1.27%	5.04%	54.00	1.85%	1.85%	19,892,538	257,386	(58,182)	252,635	451,840	(42,623)	(139,741)	(182,363)
12	314	Turbogen. Units	56.4	-1.00%	1.77%	0.02%	1.79%	36.50	-1.46%	2.74%	0.04%	-0.40%	2.38%	63.00	1.59%	1.59%	6,469,874	62,560	1,441	(25,879)	38,122	(12,018)	(1,147)	(13,165)
13	315	Acc. Elect. Equip.	54.5	-8.00%	1.83%	0.15%	1.98%	43.48	3.91%	2.30%	-0.09%	-2.94%	-0.73%	56.00	1.79%	1.79%	1,334,120	6,205	(3,159)	(39,223)	(36,177)	(656)	(1,958)	(2,614)
14	316	Misc. Pwr. Plt. Eq.	52.5	6.00%	1.90%	-0.11%	1.79%	19.53	3.52%	5.12%	-0.18%	3.70%	8.64%	51.00	1.96%	1.96%	1,405,029	45,175	(923)	51,986	96,238	787	1,606	2,393
15		Total Riverton															37,200,228	534,227	(50,441)	571,564	1,055,351	(114,919)	(161,633)	(276,552)
16		**Iatan**																						
17	311	Struct. & Improv.	34	-14.00%	2.94%	0.41%	3.35%	28.09	-10.11%	3.56%	0.36%	0.91%	4.83%	95.00	1.05%	1.05%	3,789,814	23,452	(1,962)	34,487	55,978	(71,572)	(15,605)	(87,177)
18	312	Boiler Plant Eq.	32	-34.00%	3.13%	1.06%	4.19%	32.47	-5.84%	3.08%	0.18%	-0.58%	2.68%	54.00	1.85%	1.85%	28,143,993	(12,665)	(248,371)	(163,235)	(424,271)	(358,315)	(299,030)	(657,345)
19	314	Turbogen. Units	34	-1.00%	2.94%	0.03%	2.97%	32.68	-0.98%	3.06%	0.03%	0.27%	3.36%	63.00	1.59%	1.59%	7,705,139	9,156	45	20,804	30,005	(104,318)	(2,266)	(106,584)
20	315	Acc. Elect. Equip.	34	-8.00%	2.94%	0.24%	3.18%	32.57	4.23%	3.07%	-0.13%	0.06%	3.00%	56.00	1.79%	1.79%	3,494,267	4,501	(12,764)	2,097	(6,166)	(40,375)	(8,222)	(48,597)
21	316	Misc. Pwr. Plt. Eq.	32	6.00%	3.13%	-0.19%	2.94%	20.12	3.22%	4.97%	-0.16%	1.15%	5.96%	51.00	1.96%	1.96%	702,319	12,958	193	8,077	21,228	(8,177)	1,317	(6,860)
22		Total Iatan															43,835,532	37,402	(262,858)	(97,771)	(323,227)	(582,756)	(323,806)	(906,563)
23		**Ozark Beach - Hydro**																						
24	331	Struct. & Improv.	61	-20.00%	1.64%	0.33%	1.97%	30.77	-7.69%	3.25%	0.25%	1.76%	5.26%	61.00	1.64%	1.64%	498,456	8,028	(388)	8,773	16,413	0	(1,634)	(1,634)
25	332	Res., Dams & W. Ways	60	-10.00%	1.67%	0.17%	1.83%	70.42	-9.15%	1.42%	0.13%	-0.16%	1.39%	60.00	1.67%	1.67%	1,396,859	(3,446)	(512)	(2,235)	(6,193)	0	(2,328)	(2,328)
26	333	W Wheel, Tur. & Gen. (4)	68	0.00%	0.00%	0.00%	0.00%	79.37	0.79%	1.26%	-0.01%	-1.77%	-0.52%	68.00	1.47%	1.47%	353,036	4,448	(35)	(6,249)	(1,836)	5,192	0	5,192
27	334	Acc. Elect. Equip.	70	-5.00%	1.43%	0.07%	1.50%	29.94	3.89%	3.34%	-0.13%	0.66%	3.87%	70.00	1.43%	1.43%	737,339	14,094	(1,485)	4,866	17,475	0	(527)	(527)
28	335	Misc. Pwr. Plt. Eq.	41	-14.00%	2.44%	0.34%	2.78%	21.69	1.74%	4.61%	-0.08%	1.36%	5.89%	41.00	2.44%	2.44%	244,207	5,302	(1,029)	3,321	7,594	0	(834)	(834)
29		Total Ozark Beach															3,229,897	28,426	(3,450)	8,477	33,453	5,192	(5,323)	(131)
30		**Other Production**																						
31	(1), (2)	Riverton	30.38	-3.60%	3.29%	0.12%	3.41%	23.58	3.54%	4.24%	-0.15%	0.41%	4.50%	50.52	1.98%	1.98%	11,774,979	111,685	(31,615)	48,277	128,347	(154,494)	(13,953)	(168,447)
32	(1), (2)	Energy Center	30.20	-3.60%	3.31%	0.12%	3.43%	24.81	3.23%	4.03%	-0.13%	0.28%	4.18%	45.57	2.19%	2.19%	34,770,564	250,066	(86,644)	97,358	260,779	(388,119)	(41,443)	(429,562)
33		State Line																						
	(1), (2)	Unit 1	30.65	-3.60%	3.26%	0.12%	3.38%	20.28	2.84%	4.93%	-0.14%	-0.09%	4.70%	50.65	1.97%	1.97%	35,716,024	595,547	(91,952)	(32,144)	471,452	(460,161)	(41,949)	(502,110)
	(1), (2)	Unit 2	30.74	-3.60%	3.25%	0.12%	3.37%	19.72	2.76%	5.07%	-0.14%	0.06%	4.99%	35.00	2.86%	2.86%	140,475,204	2,552,581	(361,168)	84,285	2,275,698	(555,935)	(164,502)	(720,437)
34		Total Other Production															222,736,771	3,509,879	(571,379)	197,776	3,136,276	(1,558,708)	(261,847)	(1,820,555)
35		Total Production															399,729,446	6,013,750	(962,279)	2,149,665	7,201,136	(2,699,208)	(1,122,161)	(3,821,369)

Shaded cells differ from depreciation rate shown in Staff's testimony as well as what the in effect rate is.

(1) Composite for Accounts 341 to 346.
(2) Company depreciated Accounts 341-346 as a composite, and Staff and Existing do not. For comparison purposes, Staff and Existing rate is weighted by plant cost.
(3) Adjusted Ordered salvage to tie to actual rates.
(4) Company is no longer expensing Account 333.
(5) Implied life and net salvage ratio based on base accrual rate and net salvage percent, respectively.

The Empire District Electric Company
Comparison of Depreciation Rate Recommendations

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]	[L]	[M]	[N]
			Existing					Company Proposal					
Line No.	Acct. No.	Description	Average Service Life	Net Salvage Ratio	Base Accrual Rate	Net Salvage	Total Rate	Average Service Life	Net Salvage Ratio	Base Accrual Rate	Net Salvage	Reserve	Total Rate
			Years	%	% 1/[D]	% -[E]/[D]	% [F]+[G]	Years	%	% 1/[I]	% -[J]/[I]	%	% [K]+[L]+[M]
36		**Transmission Plant**											
37	352	Structures & Improvements	77.00	-22.00%	1.30%	0.29%	1.58%	50.00	-15.00%	2.00%	0.30%	-0.54%	1.76%
38	353	Station Equipment	44.00	-13.00%	2.27%	0.30%	2.57%	46.00	-20.00%	2.17%	0.43%	-0.01%	2.59%
39	354	Towers and Fixtures	71.00	-11.00%	1.41%	0.15%	1.56%	50.00	-25.00%	2.00%	0.50%	-0.99%	1.51%
40	355	Poles and Fixtures	48.00	-30.00%	2.08%	0.63%	2.71%	50.00	-30.00%	2.00%	0.60%	-0.17%	2.43%
41	356	OH Conductors & Devices	48.00	-8.00%	2.08%	0.17%	2.25%	50.00	-15.00%	2.00%	0.30%	-0.07%	2.23%
42		Total Transmission Plant											
43		**Distribution Plant**											
44	361	Structures & Improvements	49.00	-10.00%	2.04%	0.20%	2.24%	50.00	-15.00%	2.00%	0.30%	0.04%	2.34%
45	362	Station Equipment	35.00	-5.00%	2.86%	0.14%	3.00%	38.00	-10.00%	2.63%	0.26%	-0.11%	2.79%
46	364	Poles, Towers, and Fixtures	39.00	-66.00%	2.56%	1.69%	4.26%	41.00	-65.00%	2.44%	1.59%	0.19%	4.22%
47	365	OH Conductors & Devices	45.00	-29.00%	2.22%	0.64%	2.87%	48.00	-20.00%	2.08%	0.42%	-0.04%	2.46%
48	366	Underground Conduit (3)	25.00	1.00%	4.00%	-0.04%	3.96%	34.00	-5.00%	2.94%	0.15%	-0.15%	2.93%
49	367	UG Conduct. and Devices	21.00	12.00%	4.76%	-0.57%	4.19%	27.00	0.00%	3.70%	0.00%	-0.07%	3.64%
50	368	Line Transformers (3)	35.00	1.00%	2.86%	-0.03%	2.83%	40.00	-10.00%	2.50%	0.25%	-0.04%	2.71%
51	369	Services (3)	28.00	-17.00%	3.57%	0.61%	4.18%	33.00	-25.00%	3.03%	0.76%	-0.11%	3.68%
52	370	Meters	38.00	0.00%	2.63%	0.00%	2.63%	39.00	0.00%	2.56%	0.00%	-0.28%	2.28%
53	371	Install. on Cust. Premises (3)	17.00	1.00%	5.88%	-0.06%	5.82%	20.00	-10.00%	5.00%	0.50%	-0.37%	5.13%
54	373	St. Lighting & Signal Systems (3)	31.00	23.00%	3.23%	-0.74%	2.48%	43.00	-20.00%	2.33%	0.47%	-0.55%	2.24%
55		Total Distribution Plant											
56		**General Plant**											
57	390	Structures & Improvements	22.00	-3.00%	4.55%	0.14%	4.68%	25.00	-10.00%	4.00%	0.40%	1.02%	5.42%
58	391.1	Office Furniture and Equip.	21.00	2.00%	4.76%	-0.10%	4.67%	20.00	0.00%	5.00%	0.00%	-0.10%	4.90%
59	391.2	Computer Equipment	21.00	2.00%	4.76%	-0.10%	4.67%	5.00	10.00%	20.00%	-2.00%	0.00%	18.00%
60	392	Transportation Equipment	11.00	1.00%	9.09%	-0.09%	9.00%	10.00	10.00%	10.00%	-1.00%	-5.78%	3.22%
61	393	Stores Equipment	23.00	-5.00%	4.35%	0.22%	4.57%	25.00	-5.00%	4.00%	0.20%	-0.51%	3.69%
62	394	Tool, Shop and Garage Equip.	27.00	1.00%	3.70%	-0.04%	3.67%	40.00	0.00%	2.50%	0.00%	-1.06%	1.44%
63	395	Laboratory Equipment	34.00	-2.00%	2.94%	0.06%	3.00%	38.00	0.00%	2.63%	0.00%	-0.79%	1.84%
64	396	Power Operated Equipment	14.00	6.00%	7.14%	-0.43%	6.71%	15.00	5.00%	6.67%	-0.33%	-0.25%	6.09%
65	397	Communication Equipment	21.00	0.00%	4.76%	0.00%	4.76%	20.00	0.00%	5.00%	0.00%	0.07%	5.07%
66	398	Miscellaneous Equipment	26.00	-1.00%	3.85%	0.04%	3.88%	27.00	0.00%	3.70%	0.00%	-0.45%	3.26%
67		Total General Plant											
68		Total Mass Property Accounts											
69		Total											

[A]	[B]	[C]	[O]	[P]	[Q]	[R]	[S]	[T]	[U]	[V]	[W]	[X]	[Y]
			Staff Proposal				Increase Proposed by Company				Increase Proposed by Staff		
Line No.	Acct. No.	Description	Average Service Life	Base Accrual Rate	Total Rate	Depreciable Plant	Base Accrual Rate	Net Salvage	Reserve Amortization	Total	Base Accrual Rate	Net Salvage	Total Rate
			Years	% 1/[O]	%	$	$ [[K]-[F]]x[R]	$ [[L]-[G]]x[R]	$ [M]x[R]	$ [S]+[T]+[U]	$ [[P]-[F]]x[R]	$ -[G]x[R]	$ [W]+[X]
36		**Transmission Plant**											
37	352	Structures & Improvements	73.00	1.37%	1.37%	2,333,000	16,361	333	(12,496)	4,199	1,660	(6,666)	(5,006)
38	353	Station Equipment	45.70	2.19%	2.19%	59,405,382	(58,701)	82,768	(8,233)	15,834	(50,223)	(175,516)	(225,739)
39	354	Towers and Fixtures	77.00	1.30%	1.30%	777,079	4,597	2,681	(7,730)	(452)	(853)	(1,204)	(2,057)
40	355	Poles and Fixtures	54.00	1.85%	1.85%	21,264,202	(17,720)	(5,316)	(36,072)	(59,108)	(49,223)	(132,901)	(182,124)
41	356	OH Conductors & Devices	70.00	1.43%	1.43%	38,472,953	(32,061)	51,297	(25,829)	(6,593)	(251,906)	(64,122)	(316,028)
42		Total Transmission Plant				122,252,616	(87,524)	131,764	(90,360)	(46,119)	(350,545)	(380,408)	(730,953)
43		**Distribution Plant**											
44	361	Structures & Improvements	50.50	1.98%	1.98%	8,503,744	(3,471)	8,157	3,809	8,495	(5,155)	(17,355)	(22,509)
45	362	Station Equipment	40.90	2.44%	2.44%	47,342,791	(106,788)	56,954	(49,959)	(99,794)	(195,126)	(67,633)	(262,758)
46	364	Poles, Towers, and Fixtures	41.10	2.43%	2.43%	76,134,158	(95,227)	(81,419)	146,283	(30,363)	(99,745)	(1,288,424)	(1,388,170)
47	365	OH Conductors & Devices	47.70	2.10%	2.10%	83,780,468	(116,362)	(190,833)	(36,614)	(343,809)	(105,384)	(539,919)	(645,303)
48	366	Underground Conduit (3)	33.70	2.97%	2.97%	11,852,108	(125,493)	22,170	(18,232)	(121,554)	(122,390)	4,741	(117,649)
49	367	UG Conduct. and Devices	27.70	3.61%	3.61%	25,434,746	(269,151)	145,341	(16,737)	(140,546)	(292,957)	145,341	(147,615)
50	368	Line Transformers (3)	39.90	2.51%	2.51%	55,472,129	(198,115)	154,530	(24,943)	(68,528)	(194,639)	15,849	(178,790)
51	369	Services (3)	33.00	3.03%	3.03%	35,129,098	(190,093)	52,846	(39,305)	(176,552)	(190,093)	(213,284)	(403,376)
52	370	Meters	38.70	2.58%	2.58%	12,650,100	(8,536)	0	(35,984)	(44,520)	(6,021)	0	(6,021)
53	371	Install. on Cust. Premises (3)	19.40	5.15%	5.15%	9,575,078	(84,486)	53,508	(35,276)	(66,254)	(69,679)	5,632	(64,047)
54	373	St. Lighting & Signal Systems (3)	42.40	2.36%	2.36%	8,514,692	(76,651)	102,777	(47,190)	(21,065)	(73,849)	63,174	(10,676)
55		Total Distribution Plant				374,389,112	(1,274,372)	324,029	(154,148)	(1,104,491)	(1,355,038)	(1,891,876)	(3,246,914)
56		**General Plant**											
57	390	Structures & Improvements	23.40	4.27%	4.27%	9,162,404	(49,977)	24,155	93,182	67,361	(24,917)	(12,494)	(37,411)
58	391.1	Office Furniture and Equip.	20.80	4.81%	4.81%	4,633,354	11,032	4,413	(4,628)	10,817	2,121	4,413	6,534
59	391.2	Computer Equipment	7.00	14.29%	14.29%	2,611,643	397,965	(49,746)	0	348,219	248,728	2,487	251,215
60	392	Transportation Equipment	10.50	9.52%	9.52%	6,047,214	54,975	(54,975)	(349,324)	(349,324)	26,178	5,497	31,676
61	393	Stores Equipment	25.30	3.95%	3.95%	350,586	(1,219)	(61)	(1,795)	(3,075)	(1,386)	(762)	(2,148)
62	394	Tool, Shop and Garage Equip.	40.00	2.50%	2.50%	2,172,026	(26,145)	804	(23,100)	(48,440)	(26,145)	804	(25,340)
63	395	Laboratory Equipment	37.60	2.66%	2.66%	879,216	(2,722)	(517)	(6,930)	(10,169)	(2,476)	(517)	(2,993)
64	396	Power Operated Equipment	15.00	6.67%	6.67%	9,418,975	(44,852)	8,970	(23,294)	(59,176)	(44,852)	40,367	(4,485)
65	397	Communication Equipment	20.20	4.95%	4.95%	9,620,429	22,906	0	6,719	29,625	18,143	0	18,143
66	398	Miscellaneous Equipment	26.70	3.75%	3.75%	184,451	(263)	(71)	(822)	(1,156)	(186)	(71)	(257)
67		Total General Plant				45,080,298	361,699	(67,026)	(309,992)	(15,319)	195,209	39,724	234,934
68		Total Mass Property Accounts				541,722,026	(1,000,197)	388,767	(554,500)	(1,165,930)	(1,510,373)	(2,232,560)	(3,742,934)
69		Total				941,451,472	5,013,553	(573,511)	1,595,165	6,035,206	(4,209,581)	(3,354,721)	(7,564,302)

Schedule LWL-4 5/3/2001

The Empire District Electric Company
Implications of Interim Additions and Retirements
On Depreciation Rates

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]	[L]	[M]
Plant in Service					Depreciation Reserve					Required Depreciation Rate		
Plant Year	Beginning Balance	Capital Additions	Capital Retirements	Ending Balance	Beginning Balance	Expense	Capital Retirements	Net Salvage	Ending Balance	Unrecovered Investment	Recovery Period	Depreciation Rate
	$	$	$	$	$	$	$	$	$	$	Years	%
0	-	1,000,000	-	1,000,000					-	1,000,000	35	2.86%
1	1,000,000	5,000	5,000	1,000,000	-	28,571	5,000	-	23,571	976,429	34	2.87%
2	1,000,000	5,000	5,000	1,000,000	23,571	28,718	5,000	-	47,290	952,710	33	2.89%
3	1,000,000	5,000	5,000	1,000,000	47,290	28,870	5,000	-	71,160	928,840	32	2.90%
4	1,000,000	5,000	5,000	1,000,000	71,160	29,026	5,000	-	95,186	904,814	31	2.92%
5	1,000,000	5,000	5,000	1,000,000	95,186	29,188	5,000	-	119,374	880,626	30	2.94%
6	1,000,000	5,000	5,000	1,000,000	119,374	29,354	5,000	-	143,728	856,272	29	2.95%
7	1,000,000	5,000	5,000	1,000,000	143,728	29,527	5,000	-	168,255	831,745	28	2.97%
8	1,000,000	5,000	5,000	1,000,000	168,255	29,705	5,000	-	192,960	807,040	27	2.99%
9	1,000,000	5,000	5,000	1,000,000	192,960	29,890	5,000	-	217,850	782,150	26	3.01%
10	1,000,000	5,000	5,000	1,000,000	217,850	30,083	5,000	-	242,933	757,067	25	3.03%
11	1,000,000	5,000	5,000	1,000,000	242,933	30,283	5,000	-	268,215	731,785	24	3.05%
12	1,000,000	5,000	5,000	1,000,000	268,215	30,491	5,000	-	293,707	706,293	23	3.07%
13	1,000,000	5,000	5,000	1,000,000	293,707	30,708	5,000	-	319,415	680,585	22	3.09%
14	1,000,000	5,000	5,000	1,000,000	319,415	30,936	5,000	-	345,351	654,649	21	3.12%
15	1,000,000	5,000	5,000	1,000,000	345,351	31,174	5,000	-	371,524	628,476	20	3.14%
16	1,000,000	5,000	5,000	1,000,000	371,524	31,424	5,000	-	397,948	602,052	19	3.17%
17	1,000,000	5,000	5,000	1,000,000	397,948	31,687	5,000	-	424,635	575,365	18	3.20%
18	1,000,000	5,000	5,000	1,000,000	424,635	31,965	5,000	-	451,600	548,400	17	3.23%
19	1,000,000	5,000	5,000	1,000,000	451,600	32,259	5,000	-	478,859	521,141	16	3.26%
20	1,000,000	5,000	5,000	1,000,000	478,859	32,571	5,000	-	506,430	493,570	15	3.29%
21	1,000,000	5,000	5,000	1,000,000	506,430	32,905	5,000	-	534,335	465,665	14	3.33%
22	1,000,000	5,000	5,000	1,000,000	534,335	33,262	5,000	-	562,596	437,404	13	3.36%
23	1,000,000	5,000	5,000	1,000,000	562,596	33,646	5,000	-	591,243	408,757	12	3.41%
24	1,000,000	5,000	5,000	1,000,000	591,243	34,063	5,000	-	620,306	379,694	11	3.45%
25	1,000,000	5,000	5,000	1,000,000	620,306	34,518	5,000	-	649,824	350,176	10	3.50%
26	1,000,000	5,000	5,000	1,000,000	649,824	35,018	5,000	-	679,841	320,159	9	3.56%
27	1,000,000	5,000	5,000	1,000,000	679,841	35,573	5,000	-	710,414	289,586	8	3.62%
28	1,000,000	5,000	5,000	1,000,000	710,414	36,198	5,000	-	741,613	258,387	7	3.69%
29	1,000,000	5,000	5,000	1,000,000	741,613	36,912	5,000	-	773,525	226,475	6	3.77%
30	1,000,000	5,000	5,000	1,000,000	773,525	37,746	5,000	-	806,271	193,729	5	3.87%
31	1,000,000	5,000	5,000	1,000,000	806,271	38,746	5,000	-	840,017	159,983	4	4.00%
32	1,000,000	5,000	5,000	1,000,000	840,017	39,996	5,000	-	875,013	124,987	3	4.17%
33	1,000,000	5,000	5,000	1,000,000	875,013	41,662	5,000	-	911,675	88,325	2	4.42%
34	1,000,000	5,000	5,000	1,000,000	911,675	44,162	5,000	-	950,838	49,162	1	4.92%
35	1,000,000	-	1,000,000	-	950,838	49,162	1,000,000	-	-	-		
Total		1,170,000	1,170,000			1,170,000	1,170,000	-				

Assumptions:
Interim Additions and Retirements Amount to 0.50%

The Empire District Electric Company
Implications of Interim Additions and Retirements
On Depreciation Rates

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]	[L]	[M]
Plant in Service					Depreciation Reserve					Required Depreciation Rate		
Plant Year	Beginning Balance	Capital Additions	Capital Retirements	Ending Balance	Beginning Balance	Expense	Capital Retirements	Net Salvage	Ending Balance	Unrecovered Investment	Recovery Period	Depreciation Rate
	$	$	$	$	$	$	$	$	$	$	Years	%
0	-	1,000,000	-	1,000,000					-	1,170,000	35	3.34%
1	1,000,000	5,000	5,000	1,000,000	-	33,429	5,000	-	28,429	1,136,571	34	3.34%
2	1,000,000	5,000	5,000	1,000,000	28,429	33,429	5,000	-	56,857	1,103,143	33	3.34%
3	1,000,000	5,000	5,000	1,000,000	56,857	33,429	5,000	-	85,286	1,069,714	32	3.34%
4	1,000,000	5,000	5,000	1,000,000	85,286	33,429	5,000	-	113,714	1,036,286	31	3.34%
5	1,000,000	5,000	5,000	1,000,000	113,714	33,429	5,000	-	142,143	1,002,857	30	3.34%
6	1,000,000	5,000	5,000	1,000,000	142,143	33,429	5,000	-	170,571	969,429	29	3.34%
7	1,000,000	5,000	5,000	1,000,000	170,571	33,429	5,000	-	199,000	936,000	28	3.34%
8	1,000,000	5,000	5,000	1,000,000	199,000	33,429	5,000	-	227,429	902,571	27	3.34%
9	1,000,000	5,000	5,000	1,000,000	227,429	33,429	5,000	-	255,857	869,143	26	3.34%
10	1,000,000	5,000	5,000	1,000,000	255,857	33,429	5,000	-	284,286	835,714	25	3.34%
11	1,000,000	5,000	5,000	1,000,000	284,286	33,429	5,000	-	312,714	802,286	24	3.34%
12	1,000,000	5,000	5,000	1,000,000	312,714	33,429	5,000	-	341,143	768,857	23	3.34%
13	1,000,000	5,000	5,000	1,000,000	341,143	33,429	5,000	-	369,571	735,429	22	3.34%
14	1,000,000	5,000	5,000	1,000,000	369,571	33,429	5,000	-	398,000	702,000	21	3.34%
15	1,000,000	5,000	5,000	1,000,000	398,000	33,429	5,000	-	426,429	668,571	20	3.34%
16	1,000,000	5,000	5,000	1,000,000	426,429	33,429	5,000	-	454,857	635,143	19	3.34%
17	1,000,000	5,000	5,000	1,000,000	454,857	33,429	5,000	-	483,286	601,714	18	3.34%
18	1,000,000	5,000	5,000	1,000,000	483,286	33,429	5,000	-	511,714	568,286	17	3.34%
19	1,000,000	5,000	5,000	1,000,000	511,714	33,429	5,000	-	540,143	534,857	16	3.34%
20	1,000,000	5,000	5,000	1,000,000	540,143	33,429	5,000	-	568,571	501,429	15	3.34%
21	1,000,000	5,000	5,000	1,000,000	568,571	33,429	5,000	-	597,000	468,000	14	3.34%
22	1,000,000	5,000	5,000	1,000,000	597,000	33,429	5,000	-	625,429	434,571	13	3.34%
23	1,000,000	5,000	5,000	1,000,000	625,429	33,429	5,000	-	653,857	401,143	12	3.34%
24	1,000,000	5,000	5,000	1,000,000	653,857	33,429	5,000	-	682,286	367,714	11	3.34%
25	1,000,000	5,000	5,000	1,000,000	682,286	33,429	5,000	-	710,714	334,286	10	3.34%
26	1,000,000	5,000	5,000	1,000,000	710,714	33,429	5,000	-	739,143	300,857	9	3.34%
27	1,000,000	5,000	5,000	1,000,000	739,143	33,429	5,000	-	767,571	267,429	8	3.34%
28	1,000,000	5,000	5,000	1,000,000	767,571	33,429	5,000	-	796,000	234,000	7	3.34%
29	1,000,000	5,000	5,000	1,000,000	796,000	33,429	5,000	-	824,429	200,571	6	3.34%
30	1,000,000	5,000	5,000	1,000,000	824,429	33,429	5,000	-	852,857	167,143	5	3.34%
31	1,000,000	5,000	5,000	1,000,000	852,857	33,429	5,000	-	881,286	133,714	4	3.34%
32	1,000,000	5,000	5,000	1,000,000	881,286	33,429	5,000	-	909,714	100,286	3	3.34%
33	1,000,000	5,000	5,000	1,000,000	909,714	33,429	5,000	-	938,143	66,857	2	3.34%
34	1,000,000	5,000	5,000	1,000,000	938,143	33,429	5,000	-	966,571	33,429	1	3.34%
35	1,000,000	-	1,000,000	-	966,571	33,429	1,000,000	-	-	-		
Total		1,170,000	1,170,000			1,170,000	1,170,000	-				

Assumptions:

Interim Additions and Retirements Amount to 0.50%

Schedule LWL-4 5/3/2001

The Empire District Electric Company
Implications of Interim Additions and Retirements
On Depreciation Rates

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]	[L]	[M]
Plant in Service					Depreciation Reserve					Required Depreciation Rate		
Plant Year	Beginning Balance	Capital Additions	Capital Retirements	Ending Balance	Beginning Balance	Expense	Capital Retirements	Net Salvage	Ending Balance	Unrecovered Investment	Recovery Period	Depreciation Rate
	$	$	$	$	$	$	$	$	$	$	Years	%
0	-	1,000,000	-	1,000,000					-	1,000,000	29.90	3.34%
1	1,000,000	5,000	5,000	1,000,000	-	33,445	5,000	-	28,445	971,555	29.05	3.34%
2	1,000,000	5,000	5,000	1,000,000	28,445	33,444	5,000	-	56,889	943,111	28.20	3.34%
3	1,000,000	5,000	5,000	1,000,000	56,889	33,444	5,000	-	85,333	914,667	27.35	3.34%
4	1,000,000	5,000	5,000	1,000,000	85,333	33,443	5,000	-	113,776	886,224	26.50	3.34%
5	1,000,000	5,000	5,000	1,000,000	113,776	33,442	5,000	-	142,218	857,782	25.65	3.34%
6	1,000,000	5,000	5,000	1,000,000	142,218	33,442	5,000	-	170,660	829,340	24.80	3.34%
7	1,000,000	5,000	5,000	1,000,000	170,660	33,441	5,000	-	199,101	800,899	23.95	3.34%
8	1,000,000	5,000	5,000	1,000,000	199,101	33,440	5,000	-	227,542	772,458	23.10	3.34%
9	1,000,000	5,000	5,000	1,000,000	227,542	33,440	5,000	-	255,981	744,019	22.25	3.34%
10	1,000,000	5,000	5,000	1,000,000	255,981	33,439	5,000	-	284,420	715,580	21.40	3.34%
11	1,000,000	5,000	5,000	1,000,000	284,420	33,438	5,000	-	312,859	687,141	20.55	3.34%
12	1,000,000	5,000	5,000	1,000,000	312,859	33,438	5,000	-	341,296	658,704	19.70	3.34%
13	1,000,000	5,000	5,000	1,000,000	341,296	33,437	5,000	-	369,733	630,267	18.85	3.34%
14	1,000,000	5,000	5,000	1,000,000	369,733	33,436	5,000	-	398,169	601,831	18.00	3.34%
15	1,000,000	5,000	5,000	1,000,000	398,169	33,435	5,000	-	426,604	573,396	17.15	3.34%
16	1,000,000	5,000	5,000	1,000,000	426,604	33,434	5,000	-	455,038	544,962	16.30	3.34%
17	1,000,000	5,000	5,000	1,000,000	455,038	33,433	5,000	-	483,471	516,529	15.45	3.34%
18	1,000,000	5,000	5,000	1,000,000	483,471	33,432	5,000	-	511,904	488,096	14.60	3.34%
19	1,000,000	5,000	5,000	1,000,000	511,904	33,431	5,000	-	540,335	459,665	13.75	3.34%
20	1,000,000	5,000	5,000	1,000,000	540,335	33,430	5,000	-	568,765	431,235	12.90	3.34%
21	1,000,000	5,000	5,000	1,000,000	568,765	33,429	5,000	-	597,194	402,806	12.05	3.34%
22	1,000,000	5,000	5,000	1,000,000	597,194	33,428	5,000	-	625,622	374,378	11.20	3.34%
23	1,000,000	5,000	5,000	1,000,000	625,622	33,427	5,000	-	654,049	345,951	10.35	3.34%
24	1,000,000	5,000	5,000	1,000,000	654,049	33,425	5,000	-	682,474	317,526	9.50	3.34%
25	1,000,000	5,000	5,000	1,000,000	682,474	33,424	5,000	-	710,898	289,102	8.65	3.34%
26	1,000,000	5,000	5,000	1,000,000	710,898	33,422	5,000	-	739,320	260,680	7.80	3.34%
27	1,000,000	5,000	5,000	1,000,000	739,320	33,421	5,000	-	767,740	232,260	6.95	3.34%
28	1,000,000	5,000	5,000	1,000,000	767,740	33,419	5,000	-	796,159	203,841	6.10	3.34%
29	1,000,000	5,000	5,000	1,000,000	796,159	33,417	5,000	-	824,576	175,424	5.25	3.34%
30	1,000,000	5,000	5,000	1,000,000	824,576	33,414	5,000	-	852,990	147,010	4.40	3.34%
31	1,000,000	5,000	5,000	1,000,000	852,990	33,411	5,000	-	881,401	118,599	3.55	3.34%
32	1,000,000	5,000	5,000	1,000,000	881,401	33,408	5,000	-	909,809	90,191	2.70	3.34%
33	1,000,000	5,000	5,000	1,000,000	909,809	33,404	5,000	-	938,213	61,787	1.85	3.34%
34	1,000,000	5,000	5,000	1,000,000	938,213	33,398	5,000	-	966,612	33,388	1.00	3.34%
35	1,000,000	-	1,000,000	-	966,612	33,388	1,000,000	-	0	(0)		
Total		1,170,000	1,170,000			1,170,000	1,170,000	-				

Assumptions:
Interim Additions and Retirements Amount to 0.50%

Affidavit

State of Missouri)
) ss
County of Jackson)

On the 1st day of May, ~~2000~~ 2001, before me appeared L. W. Loos, to me personally known, who, being by me first duly sworn, states that he is Vice President of the Energy Services Group of the Management Consulting Division of Black & Veatch and acknowledged that he has read the above and foregoing document and believes that the statements therein are true and correct to the best of his information, knowledge and belief.

L W Loos

L. W. Loos

Subscribed and sworn to me this 1st day of May, ~~2000.~~ 2001.

Linda K. Mitchell

Notary Public

LINDA K. MITCHELL
Notary Public - Notary Seal
STATE OF MISSOURI
Cass County

My Commission Expires My Commission Expires June 26, 2002