Exhibit No.:
Issue: *Depreciation*
Witness: *Paul W. Adam*
Sponsoring Party: *MoPSC Staff*
Type of Exhibit: *Direct Testimony*
Case No.: *GR-2001-292*
Date Testimony Prepared: *April 19, 2001*

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY SERVICES DIVISION

DIRECT TESTIMONY

OF

PAUL W. ADAM

MISSOURI GAS ENERGY,
A DIVISION OF SOUTHERN UNION COMPANY

CASE NO. GR-2001-292

Jefferson City, Missouri
April 2001

DIRECT TESTIMONY

OF

PAUL W. ADAM

MISSOURI GAS ENERGY,

A DIVISION OF SOUTHERN UNION COMPANY

CASE NO. GR-2001-292

Q. Please state your name and business address.

A. Paul W. Adam, P.O. Box 360, Jefferson City, MO 65102.

Q. By whom are you employed and in what capacity?

A. I am employed by the Missouri Public Service Commission (PSC or Commission) as an Engineer II in the Engineering and Management Services Department.

Q. What are your duties as an engineer in the Engineering and Management Services Department?

A. I am responsible for depreciation determinations and studies of companies regulated by the Commission.

Q. Would you please state briefly your qualifications, educational background and experience?

A. I am a Registered Professional Engineer in Missouri and Colorado. In 1967, I earned a Bachelor of Science degree in Chemical Engineering from the University of Missouri–Columbia. I served in the U.S. Army after graduating and subsequently was employed in the oil industry from 1969 until 1991 as an engineer in various capacities, with the exception of a brief period from 1971 to 1974 when I

completed a Masters Degree in Business Administration at the University of Missouri and also built single family homes.

From 1991 to 1993 I managed a concrete products plant in Northwest Missouri. In 1994, I accepted my current position.

Q. Have you ever testified before the Commission?

A. Yes.

Q. Please state the purpose of your testimony in this case.

A. The purpose of my testimony is to: 1) repeat what was learned in Missouri Gas Energy's (MGE's or Company's) Case No. GR-98-140 that affects everyone's ability to determine depreciation rates from the study of historical retirement events; 2) present Staff's proposed depreciation rates that were determined by Staff from similar plant data obtained principally from Laclede Gas Company, St. Louis, Missouri; and 3) to explain the validity of Staff's depreciation rate proposal for accounts 3760, Mains, and 3800, Services.

Q. Have you conducted a depreciation study of the Company's capital plant?

A. Yes. This Company has not retained the data to study plant life using mortality records but engineering judgment and analogy to similar Missouri plant was used to complete a depreciation study.

Q. What was learned in Case No. GR-98-140 that affects everyone's ability to determine depreciation rates from the study of historical retirement events?

A. The direct testimony of Staff witness Woodie C. Smith in Case No. GR-98-140 states on pages 12 and 13, lines 19-21 and 1 and 2, respectively:

> MGE asserts that when the (C)ompany was purchased by Southern Union from Western Resources that the plant retirement records were not available. These problems were recognized in the 1995 Black and Veatch depreciation study. The consultant tried several methods of data analysis, and stated that those results were inconclusive.

The absence of Company-specific historical retirement data files prevents a study of Company-specific average service lives (ASLs) account by account. MGE has initiated a compilation of retirement histories beginning in 1994. Ultimately, these MGE-specific files will allow calculations to be made to determine Company-specific ASLs for MGE plant in each account.

Until there is sufficient historical retirement data to allow Company-specific ASLs to be determined, Staff recommend that ASLs of comparable plant owned and operated by other Missouri Public Service Commission-regulated gas utility companies be used, along with engineering judgment, to determine the account-by-account ASLs and depreciation rates for this Company.

Q. As a result of this situation, which was learned in Case No. GR-98-140, what actions have you taken to determine reasonable ASLs and depreciation rates for the Company?

A. I have reviewed the Company's historical data from 1998 to the present time to confirm that MGE is maintaining a historical retirements file account by account. They are. Also, I have made plant tours of MGE's facilities to meet with operating personnel and engineers to learn about the maintenance and operation of physical plant. From these visits and conversations, I developed an understanding about the type of plant in each account and its use.

Q. What conclusions have you arrived at as a result of your plant visits and conversations?

A. I have concluded that MGE's plant is similar to the plant of Laclede Gas Company in St. Louis.

Q. What do you know about Laclede's plant that brought you to this conclusion?

A. Over the past six years, I have worked with Laclede's data several times to determine ASLs and depreciation rates account by account. I have made several plant tours and discussed Laclede's plant with their operations personnel and engineers. It is my opinion that Laclede's data is current and valid.

Q. Are there other Missouri Public Service Commission-regulated gas companies whose plant histories could be used to help establish ASL's and depreciation rates for MGE's plant?

A. This may be the case with AmerenUE's gas plant but I have less exposure to it. UtiliCorp's currently ordered depreciation rates for gas plant are from Case No. GR-88-194. These rates do not have associated ASLs and would need to be brought current to be used as a "go by" for the MGE plant. I have little first-hand knowledge of UtiliCorp's gas plant.

Q. Are these the reasons that you have relied heavily on ASLs and depreciation rates determined for Laclede Gas Company's plant because of the depth of knowledge about the historical data and the similarity of plant?

A. Yes. On critical accounts, I will give my proposed ASL and the ordered ASLs for Laclede and AmerenUE.

Q. What ASLs and depreciation rates have you determined for MGE?

A. I have determined the ASLs and depreciation rates presented in my Schedule 1.

Q. What methodology was used to determine Staff's proposed ASLs and depreciation rates?

A. The methodology used on MGE's plant was to determine if it was analogous to gas plant that had lives evaluated using mortality data. An analogy was Laclede Gas Company. In the Laclede cases, Staff conducted in-depth and detailed studies of plant. Multiple placement and experience bands (i.e., groups of vintage data) were calculated and studied to determine each account's ASL. Knowing the ASL of each account, the original cost of plant is spread equally over all years. Using this methodology, depreciation is used to recover the capital cost of the plant in service from utility customers thru service rates. Net salvage cost, that includes cost of removal of plant when it is retired, is considered an annual expense rather than an annual accrual and is determined by Staff auditors and included with other annual expenses. If a large life span type property has a retirement and an associated net salvage cost as a result of a demolition and location rehabilitation project, Staff depreciation engineers will study this project and its associated cost. An appropriate net cost or net salvage cost of this type of project will be proposed for recovery by the Company through an amortization after the work is done or at least when the work is committed to by the regulated company.

Q. Is there a change in the annual accrual for depreciation from the currently ordered depreciation rates to Staff's proposed depreciation rates?

A. Yes. Excluding the Corporate plant that is partially allocated to MGE, the currently ordered depreciation rates would result in an annual depreciation accrual of $23,034,284 based on June 30, 2000 plant balances. Based on the same plant balances, the Staff's proposed depreciation rates will result in an annual depreciation accrual of $14,604,649. Added to the Staff's annual depreciation accrual would be the annual net salvage cost of $713,624 determined by the auditors. (The Corporate plant allocated to MGE will be added in at the end of this testimony and shown in the attached Schedule 1).

The sum of these two values, $15,318,273, is comparable to the ordered annual depreciation accrual ($23,034,284) that has net salvage cost included in it.

Q. This is approximately an $8 million difference. Can you explain what accounts cause this difference?

A. Nearly all of the difference is attributable to account 3800, Services. A smaller amount is attributable to account 3760, Mains. The decrease in annual accrual due to Mains is about equal to the net increase in annual accrual of all other accounts.

Q. For the Services account, 3800, why is there a change of nearly $8 million?

A. Apparently, when the depreciation rates were previously determined for Services, the ASL was too short resulting in a depreciation rate and a depreciation accrual that are too large. The currently ordered ASLs for the Services account for both Laclede Gas and AmerenUE is 44 years. Using this ASL to calculate annual accrual based on a June 30, 2000 plant balance, the annual accrual for Services is $5,481,288. The currently ordered depreciation rate does not have an ASL ordered with it. But, utilizing Black and

Veatch's (B & V's) $720,000[1] annual net salvage cost, an ASL of about 18 years can be back calculated. The difference between a reasonable ASL of 44 years, as experienced and ordered for Laclede Gas and AmerenUE Gas, versus an ASL of about 18 years is the basis for nearly $8 million difference between the annual accrual determined using the ordered depreciation rate ($13,280,654) and the annual accrual determined from Staff's proposed depreciation rate ($5,481,288).

Q. For the account 3760, Mains, what is the basis for the difference between the annual depreciation accrual determined with ordered depreciation rates and the annual depreciation accrual determined with Staff's proposed depreciation rates?

A. The basis of the difference appears to be the ASL again. The difference is about $1.2 million based on the June 30, 2000 plant balance. The ordered depreciation rate calculates an annual accrual of $4,988,376 and Staff's proposed depreciation rate calculates an annual accrual of $3,741,282.

There are differences between ASLs determined for other Missouri PSC-regulated gas service companies in the Mains account. For example, AmerenUE has an ordered ASL of 44 years. The MGE-ordered depreciation rate suggests an ASL of about 55 years. Laclede's ASL for Mains is ordered at 71 years. Staff have used the life determined for Laclede's Mains in their proposal for MGE. Staff are familiar with the quality of the data submitted by Laclede and through engineering judgment chose to use the Laclede ASLs in this MGE case. There are two basic reasons for this decision. First, Staff believes that Mains will experience ASL considerably longer than Services due to pipe size, type and wall thickness. Second, large mains in other service industries placed

[1] Black & Veatch Corporation depreciation study submitted June 8, 2000, to Mr. Robert J. Hack of Missouri Gas Energy (full study attached).

in similar soils experience lives of 70 to 100 years before pitting from electromotive forces requires replacement. Therefore, the 71 year ASL calculated from the actual historical data of Laclede gas seems reasonable for MGE's gas service mains.

Q. Do you accept the MGE's consultant's determination of net salvage cost?

A. Yes. As Mr. Sullivan of B & V states on page 11 of his study, he has determined net salvage cost on a current basis. Mr. Sullivan has left the current determination of net salvage in the depreciation rates he calculates when Staff have separated net salvage cost from recovery of original capital cost. Staff auditors will determine a normalized annual net salvage cost on a current basis and include this expense with other expenses. The level of collection for net salvage cost is essentially equal using either method of determining the value.

Q. Is there any corporate plant that is booked to the parent company, Southern Union Company, that is partially allocated to MGE?

A. Yes. There are four accounts, 2901 Structures, 3911 Computer Equipment, 3970 Communication Equipment and 3980 Miscellaneous Equipment.

Q. What did you determine about these four accounts?

A. Staff auditors determined appropriate allocations as given on Schedule 1 under the title "Southern Union Corporate" in the column titled "Plant Balance 12-13-00." From these plant balances and the proposed depreciation rates, that are consistent with the proposed depreciation rates for the same MGE only accounts, Staff determined annual accruals as given on Schedule 1. The total annual accrual for Corporate allocated plant based on 12-31-00 plant balance is $1,038,728. This small amount must be added to the previously discussed $14,604,649 for MGE only accounts.

The addition of these two annual accruals is $15,642,728. The fact that there is a different plant balance date for the two groups of plant does not affect validity of the comparisons made earlier in this testimony to ordered rates.

Q. What plant balances are used with the proposed rates in Staff's Revenue Requirement Model to determine the Company's revenue requirement for this case?

A. Normal operation is for depreciation rates to be supplied to Staff auditors that run the Revenue Requirement model. Staff auditors normally run the model with a plant balance that is nearer current than the plant balance used for comparison calculations by depreciation engineers. In this case, the Model was run with 12-31-00 plant balances. This allows the results of the Revenue Requirement Model to be as current as possible with the available data.

Q. What are Staff's proposals for this MGE case?

A. Staff propose: 1) That MGE be ordered to continue maintaining mortality records on all capital plant accounts. 2) That the lives and depreciation rates presented in Schedule 1 be ordered.

Q. Does this conclude your testimony?

A. Yes.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In The Matter of Missouri Gas Energy's Tariff Filing For General Rate Increase	))	Case No. GR-2001-292

AFFIDAVIT OF PAUL W. ADAM

STATE OF MISSOURI	)	
	)	ss.
COUNTY OF COLE	)	

Paul W. Adam, of lawful age, on his oath states: that he has participated in the preparation of the foregoing Direct Testimony in question and answer form, consisting of 9 pages to be presented in the above case; that the answers in the foregoing Direct Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true and correct to the best of his knowledge and belief.

Paul W. Adam

Subscribed and sworn to before me this 18th day of April 2001.

TONI M. CHARLTON
NOTARY PUBLIC STATE OF MISSOURI
COUNTY OF COLE
My Commission Expires December 28, 2004

Missouri Gas Energy GR-2001-292

Account #	Account	(Year) Life	(%) Depr. Rate	($) Plant Bal. 6-30-2000	($) Proposed Annual Accrual
3751	Structures	60.5	1.65	5,987,064	98,787
3760	Mains	71.0	1.41	265,339,168	3,741,282
3780	Measuring & Regulating Sta.	35.0	2.86	10,260,757	293,458
3790	City Gate Stations	47.0	2.13	2,775,072	59,109
3800	Services	44.0	2.27	241,466,436	5,481,288
3810	Meters	35.0	2.86	27,608,278	789,597
3820	Installations: Meters & Reg.	35.0	2.86	47,892,829	1,369,735
3830	Regulations	41.0	2.44	9,254,498	225,810
3850	EGM Equipment	30.0	3.33	250,335	8,336
3870	Other Equipment	n/a	0.00	-	-
3901	Structures & Improvements	50.0	2.00	419,125	8,383
3910	Furniture & Equipment	*12.4	8.06	3,012,525	242,809
3920	Transportation Equipment	11.5	8.70	4,470,517	388,935
3930	Store Equipment	37.0	2.70	499,757	13,493
3940	Tools	42.0	2.38	4,441,648	105,711
3960	Power Op. Equipment	12.0	8.33	586,189	48,830
3970	Communication Equipment	16.0	6.25	1,478,273	92,392
3971	Electronic ERT Equipment	20.0	5.00	32,607,557	1,630,378
3980	Miscellaneous Equipment	26.0	3.85	164,059	6,316
					$14,604,649

** Special Account: has 3 plant types with distinguishable lives. 12.4 years is a weighted average.*

Southern Union Corporate

(MGE Allocated)

Account #	Account	(Year) Life	(%) Depr. Rate	($) Plant Bal. 12-31-00	($) Annual Accrual
3901	Structures	50.0	2.00	295,765	5,915
3910	Furniture and Equipment	31.0	3.22	439,187	28,309
3911	Computer Equipment	10.0	10.00	10,034,929	1,003,493
3970	Communication Equipment	16.0	6.25	4,220	264
3980	Miscellaneous Equipment	26.0	3.85	2,547	98
			Total Corporate Allocated		1,038,079
			MGE Total Including Corporate Allocated Plant		15,642,728

BLACK & VEATCH

8400 Ward Parkway
P.O. Box 8405
Kansas City, Missouri 64114 USA

Tel: (913) 458-2000

Black & Veatch Corporation

June 8, 2000

Mr. Robert J. Hack
Vice President, Pricing and Regulatory Affairs
Missouri Gas Energy
3420 Broadway
Kansas City, Missouri 64111

Dear Mr. Hack:

Our enclosed report summarizes the results of our analysis of the depreciation accrual rates for the gas utility properties of Missouri Gas Energy (Company). Our studies are based on plant balances as of December 31, 1998. The Executive Summary of the report summarizes our major findings and recommendations.

Ultimately, the appropriate level of depreciation expense rates is a management decision taking into consideration various factors. If management concludes that a change is warranted in depreciation expense rates at this time, we recommend implementation of the rates set forth in Column J of Table 3-4 of this report. We are also recommending that the Company redistribute the excess accumulated reserve balance of Account 380 – Services to other accounts. The net effect of this redistribution is zero. The restated accumulated depreciation reserve for each account is shown in Column M of Table 4-1 of this report.

We have enjoyed working with you on this matter. If you have any questions concerning the contents of this report, please do not hesitate to contact us.

Very truly yours,

BLACK & VEATCH CORPORATION

Thomas J. Sullivan

KAH:jjt
Enclosures

Contents

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Executive Summary

This report describes the analyses conducted and the results obtained for the gas utility property of Missouri Gas Energy with respect to its depreciation expense rates. This report is based on plant activity through December 31, 1998. The depreciation rates developed in this report are considered appropriate for use in the near future. It is recommended these rates be reviewed at least every 3 to 5 years. Ultimately the appropriate level of depreciation expense rates is a management decision taking into account various factors.

If the Company concludes that a change in depreciation expense rates is appropriate at this time, we recommend the Company implement the depreciation expense rates based on the analyses set forth in Section 3. The individual accrual rates that we are recommending for each account recognize average service lives and reflect the results of simulated plant balance analysis, regional industry averages, reserve analysis, and our experience with similar utility property. We recommend a significant change to the following accounts:

- Account 376 - Mains. We recommend an accrual rate of 2.31 percent and an annual expense of $5.6 million as opposed to the existing accrual rate of 1.88 percent and annual expense of $4.6 million.
- Account 380 - Services. We recommend an accrual rate of 3.66 percent and an annual expense of $8.2 million as opposed to the existing accrual rate of 5.5 percent and annual expense of $12.3 million.
- Accounts 381-383 - Meters/Regulators/Installations. We recommend an accrual rate of 2.87 percent for Account 381, 2.89 percent for Account 382, and 2.49 percent for Account 383 as opposed to an existing rate of 2.05 percent for all three accounts. The recommended rates produce an annual accrual of $2.2 million versus $1.6 million based on the existing rates.
- Account 391 - Furniture and Equipment. We recommend an accrual rate of 10.27 percent and an annual expense of $328,300 as opposed to the existing accrual rate of 3.06 percent and annual expense of $97,800. This proposed accrual rate is based on the accrual rate determined for Southern Union Corporate Account 391.
- Account 394 – Tools. We recommend an accrual rate of 10 percent and an annual expense of $431,000 as opposed to the existing accrual rate of 4 percent and annual expense of $172,400.

We are also recommending that the Company redistribute the excess accumulated reserve balance of Account 380 to other accounts so that the net redistribution is zero. Based on

our recommended rates and analysis of the depreciation reserve balances, we determined that Account 380-Services has an excess of $22 million in accumulated reserve. We propose to redistribute this excess to the other accounts so that negative reserves are eliminated and reserve ratios are in line with the weighted dollar age of the account and the recommended average service lives.

In our 1995 study, we attempted several actuarial methods to determine the Company's annual depreciation expense rates. These methods included survivor curve analysis and simulated plant balance method. However, a sufficient retirement history did not exist to complete a study based on survivor curve analysis and other sources of data were inadequate to conduct a complete and reliable simulated plant balance analysis for each of the accounts. The issue of the lack of data was addressed by the Commission in its order in Case No. GR-98-140 when the Commission found "that it would not be appropriate to require the reconstruction or re-creation of records that apparently do not exist or cannot be completed by any reasonable efforts of MGE." It is our understanding that, since its inception in February 1994, Missouri Gas Energy is capturing the necessary plant information on a prospective basis for future depreciation study needs.

The scope of this report includes a discussion of the practice of depreciation accounting (Section 2), the type of information examined in our analysis, the methods applied, and the results of the analyses conducted (Section 3), and a discussion of the Company's depreciation reserve (Section 4).

1.0 Introduction

This report presents the results of our analysis of the depreciation expense requirements for the gas utility property of Missouri Gas Energy (Company or MGE). The analysis is based on plant activity through December 31, 1998. It is our understanding that the current report is primarily being performed in order to meet the Missouri Public Service Commission's requirement that depreciation rates be reviewed every five years.

Missouri Gas Energy was acquired by Southern Union Company in February 1994. Existing depreciation accrual rates are based on plant activity through December 31, 1982. In June 1995, we provided the Company with an analysis of depreciation accrual rates based on plant activity through December 31, 1994. The 1995 study was also performed to fulfill the Commission's requirement that depreciation rates are reviewed at least every five years. KPL (the Company's predecessor) had previously submitted a study in 1990.

The rates recommended in this report reflect consideration of the simulated plant balance approach, industry norms, and our experience with other utilities. Because a sufficient retirement history does not yet exist to adequately perform survivor curve analysis, we used the simulated plant balance approach to estimate average service lives for each account. We also relied upon a survey of regional industry norms.

Section 2 of this report briefly discusses the practice of depreciation accounting. Section 3 discusses the type of information examined in the analysis and the methods applied to develop the depreciation rates. Section 3 also discusses the results of the analyses and the recommended rates. Section 4 discusses the Company's existing depreciation reserve.

2.0 Depreciation Accounting

Depreciation is the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of gas plant in the course of service from causes which are known to be in current operation and against which the utility is not protected by insurance. Among the causes to be considered are wear and tear, decay, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand and requirements of public authorities, and in the case of natural gas companies, the exhaustion of natural resources (FERC Uniform System of Accounts).

Depreciation accounting provides a method whereby charges for the loss in service value are made against current income. By properly charging depreciation, the cost of depreciable plant less estimated salvage value (or plus estimated cost of removal) is distributed over the useful life of the asset in such a way as to equitably allocate it to the period during which service is provided through the use and consumption of such facilities.

2.1 Annual Depreciation Expense

The annual depreciation expense represents the annual charge against income associated with the loss of service value of utility equipment. Historically, a number of different methods have been used by gas utilities to determine the level of depreciation expense to be charged against current income. Among the more common are:

1. A percentage of the investment in depreciable property.
2. A direct appropriation by management.
3. An amount equal to the original cost investment retired during the year.
4. A percentage of revenues.

The current practice is to calculate annual depreciation expense through the application of straight-line depreciation rates to the respective plant investment account balances. In essence, the annual depreciation expense rate is a percentage figure which, when applied to the dollar balance of investment in plant, yields a depreciation expense level which is expected to amortize the Company's investment over the life of the property.

The existing depreciation rates are based on those approved by the Missouri Public Service Commission in 1982 in Case No. GR-82-151. In 1990, the Company's proposed depreciation rates were rejected by the Commission Staff (Docket No. GR-91-291) because the Staff was unable to develop a database upon which a depreciation study could be supported. Then in 1995, Black & Veatch reviewed the Company's depreciation rates as part of the Commission's five year filing requirement.

2.2 *Depreciation Reserve*

The depreciation reserve account is a balance sheet item which reflects accumulation of the activity related to annual depreciation expense and retirement accounting. Under the FERC Uniform System of Accounts, depreciation reserve is shown on the balance sheet as "Accumulated Provision for Depreciation."

The depreciation expense charged annually is accumulated in depreciation reserve. The original cost of investment in property retired during the year is deducted from the depreciation reserve. A further adjustment to the reserve is made by adding the salvage value credit and deducting the cost of removal associated with property retired. The use of proper annual depreciation rates to amortize investment over its useful service life will result in accruals to the depreciation reserve which equal the total investment ultimately retired, as adjusted for salvage value and cost of removal.

3.0 Historical Information and Procedures

The determination of a reasonable annual depreciation expense rate is dependent on average service life, cost of removal, and salvage of the property in question. Normally, the determination of average service life is largely dependent on analysis of Company records which show additions by year of installation (vintage year) and retirements by year of installation and by year of retirement. The methods used to estimate average service lives in this report include actuarial analysis (survivor curve) and semi-actuarial analysis (simulated plant balance), analysis of retirement history, review of regional industry norms, and analysis of reserve. Results produced from application of the above tools must be evaluated in connection with other available information; past, present and anticipated future economic and environmental conditions; and sound engineering judgement.

3.1 Survivor Curve Analysis

To prepare a sound and credible survivor curve analysis, a sufficient history of retirement data must exist. Based upon historical plant activity (retirements), a survivor curve which explains the percent of additions surviving by age is developed for each property group (generally each account). Using a least squares analysis technique, this experienced survivor stub curve is compared to general survivor curve types to identify the best fitting curves and service lives. These curves provide an estimation of the average service life actually experienced historically. Based on this retirement history, remaining life of the property being analyzed can be estimated.

In our study in 1995, we determined that a sufficient retirement history was not available to perform survivor curve analysis. The issue of the lack of data was addressed by the Commission in its order in Case No. GR-98-140 when the Commission found "that it would not be appropriate to require the reconstruction or re-creation of records that apparently do not exist or cannot be completed by any reasonable efforts of MGE." MGE's continuing property record only contains retirement history from 1994 to the present. This is not enough data to produce significantly reliable results using survivor curve analysis. Therefore as an alternative, we used a simulated plant balance approach to estimate average service lives of MGE's depreciable property.

3.2 Simulated Plant Balance

In this study, we conducted a simulated plant balance analysis to calculate average service lives. The simulated plant balance method may produce reliable results when aged retirement data is unavailable. The only data needed for a simulated plant balance analysis are

annual additions and end of year plant balances over an extended period. In the simulated plant balance method, actual end of year plant balances are compared to those simulated by applying the percent surviving at a given age to the initial additions. The curve type that best simulates actual plant balances is the curve that best explains the mortality characteristics of the plant.

The simulated plant balance analysis is based on plant ledger summaries provided by the Company for the period 1968 through 1998. Generally, a reasonable simulated plant estimate requires 40 or more years of data, but may be reduced provided that the data is "clean" and "behaves" reasonably. Because we do not have plant ledger data prior to 1968 and therefore have no breakdown of the initial plant balance in 1968, we performed two analyses: starting with a zero beginning balance in 1968 and starting with the 1968 beginning balance. Tables 3-1 and 3-2 summarize the results of these analyses. Based on review of these tables, and a thorough assessment of the additions, retirements, transfers, and year end plant balances, it is evident that the simulated plant balance approach does not produce reasonable estimates for many of the individual accounts.

For example, in the Company's two largest accounts, mains and services (Accounts 376 and 380, respectively), the average service lives were determined to be 43 years and 27 years, respectively, when the analysis was run starting with a zero beginning balance in 1968 (Table 3-1). Although these results may not be unreasonable, underlying problems exist with these accounts that would reduce confidence in these results alone. When the analysis was run starting with the 1968 beginning balance (Table 3-2), the program could not converge on Account 376 and on Account 380, the average service life was determined to be 21 years. This second analysis did not provide further confidence in the results.

Review of the simulated plant balance statistics for the mains account (376), shows that the retirements index is low, around 36 percent. The retirement index is the percent of the property retired from the oldest vintage. A low retirements index is an indication that the data does not contain enough history to confidently predict the life characteristics of the property. For this account (376), confidence in the result would be improved by use of more historical data.

In the services account (380), three problems exist with the data. First, nearly 85 percent of the account balance has been added within the last ten years. Thus, the indicated average service life of 27 years does not reflect the life characteristics of the majority of the account since it has only recently been placed in service through the Company's service replacement program. Second, use of the simulated plant balance method in this instance does not permit assessment of life characteristics of the differing types of services (plastics, bare steel, protected steel, etc). The average service life of services typically varies depending on the

Table 3-1
Missouri Gas Energy
Summary of Simulated Plant Balance Analysis
Starting with a Zero Beginning Balance in 1968

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	
		Number 1 Rank		Number 2 Rank		Number 3 Rank		
Acct. No.	Account Description	Curve Type	Avg. Service Life Years	Curve Type	Avg. Service Life Years	Curve Type	Avg. Service Life Years	
Distribution Plant								
037400	Land Rights (1)	S 6.0	15	S 5.0	15	L 5.0	15	(3)
037500	Structures (2)	S 6.0	11	S 5.0	12	L 5.0	12	(3)
037600	Mains	SC 0.0	43	R 0.5	38	S -0.5	35	
037800	Measuring and Regulating Station	SC 0.0	29	R 0.5	28	L 0.0	27	
037900	City Gate Station	S 6.0	10	R 5.0	10	S 5.0	10	(3)
038000	Services	SC 0.0	27	R 0.5	24	L 0.0	25	
038100	Meters	L 0.0	9	SC 0.0	10	L 0.5	9	(4)
038200	Meter/Regulator Installations	Program could not converge - large positive transfers.						
038300	Regulators	L 0.0	16	L 0.5	15	L 1.0	14	(4)
038700	Other Equipment	L 0.0	15	SC 0.0	17	L 0.5	15	(4)
General Plant								
039000	Structures (2)	L 3.0	8	L 2.0	9	L 1.5	9	(4)
039100	Office Furniture & Equipment	R 0.5	12	SC 0.0	12	R 1.0	11	
039200	Transportation Equipment	L 3.0	8	S 2.0	8	S 1.5	8	
039300	Stores Equipment	R 2.5	20	R 3.0	19	S 1.5	21	
039400	Tool, Shop & Garage Equipment	L 0.0	16	SC 0.0	18	L 0.5	15	
039500	Lab Equipment	Not enough data.						
039600	Power Operated Equipment	L 0.0	8	L 0.5	8	SC 0.0	9	
039700	Communication Equipment	S 5.0	9	L 5.0	9	R 5.0	9	
039800	Miscellaneous Equipment	L 1.0	12	L 0.5	14	L 0.0	15	

(1) Includes land because before 1984 there was no separation between land and land rights
(2) Includes leasehold improvements because before 1984 there was no separation between structures and leasehold improvements.
(3) High modal curves - unreasonably low life.
(4) Unreasonably low value.

Table 3-2
Missouri Gas Energy
Summary of Simulated Plant Balance Analysis
Starting with 1968 Beginning Balance

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
		Number 1 Rank		Number 2 Rank		Number 3 Rank	
Acct. No.	Account Description	Curve Type	Avg. Service Life Years	Curve Type	Avg. Service Life Years	Curve Type	Avg. Service Life Years
Distribution Plant							
037400	Land Rights (1)	S 6.0	23	S 5.0	23	R 5.0	23
037500	Structures (2)	S 5.0	20	R 5.0	8	L 5.0	20
037600	Mains	Could not Converge					
037800	Measuring and Regulating Station	S 6.0	26	S 5.0	27	L 5.0	28
037900	City Gate Station	Could not Converge					
038000	Services	S 6.0	21	S 5.0	22	R 5.0	22
038100	Meters	S 6.0	19	S 5.0	19	R 5.0	19
038200	Meter/Regulator Installations	Balances same as above. Not run again.					
038300	Regulators	Could not Converge					
038700	Other Equipment	R 1.5	19	S 0.5	19	S 0.0	19
General Plant							
039000	Structures (2)	S 2.0	12	S 1.5	13	S 3.0	12
039100	Office Furniture & Equipment	S 6.0	13	S 5.0	13	R 5.0	13
039200	Transportation Equipment	Balances same as above. Not run again.					
039300	Stores Equipment	S 6.0	21	S 5.0	21	R 5.0	22
039400	Tool, Shop & Garage Equipment	S 6.0	18	S 5.0	18	R 5.0	18
039500	Lab Equipment	Balances same as above. Not run again.					
039600	Power Operated Equipment	L 0.5	10	L 1.0	10	L 1.5	10
039700	Communication Equipment	L 2.0	15	L 1.0	17	L 1.5	16
039800	Miscellaneous Equipment	S 5.0	29	R 5.0	29	S 4.0	30

(1) Includes land because before 1984 there was no separation between land and land rights
(2) Includes leasehold improvements because before 1984 there was no separation between structures and leasehold improvements.

Schedule 1-10

type of service in place. The use of a simulated plant balance analysis results in an aggregate service life that may not be indicative of the account, especially of the property which currently exists. Third, a higher retirements index is calculated for the services account. This result is in line with expectations since older vintages have been recently retired with the services replacement program. Generally, a relatively higher retirements index is desired. However, in this instance, a high index merely substantiates that the majority of the account consists of relatively new property.

Simulated plant balance analysis of accounts 378, 387, 391, and 393 returned average service lives which are not far from the estimated average service lives underlying the existing rates and which are within the range of industry norms.

The following identifies some of the difficulties we encountered with the remaining accounts in connection with the simulated plant balance analysis:

- Account 374 had a large negative transfer in 1988 that skewed the results of simulated plant balance therefore returning a low average service life of 16 years.
- Accounts 375, 379, 381, and 383 to various degrees, yielded unreasonably low average service lives as compared with industry averages and prior experience with utility property.
- Account 382 incurred large positive transfers from 1984-1991 making the procedure unable to converge on an average service life.
- Account 383 has had approximately 60 percent of its account added in the last five years therefore returning a low average service life.
- Account 390 has had approximately 80 percent of its account retired in 1993.
- Account 395 has only existed since 1992 and therefore does not contain enough data to use simulated plant balance method.

3.3 Regional Industry Norms

We include regional industry norms as another consideration to calculate average service lives. Table 3-3 summarizes effective depreciation information we surveyed from 12 Midwestern gas utilities. These utilities include Northern Indiana Public Service Company, K N Energy, ONEOK (Western Resources), Atmos Energy Corporation (United Cities Gas Company), Missouri Public Service, AmerenUE, Alliant Energy (Interstate Power Company), Peoples Natural Gas, MidAmerican Energy (Iowa - Illinois Gas and Electric Company), MidAmerican Energy (Midwest Gas), Alliant Energy (IES), and LaClede Gas Company.

Table 3-3

Missouri Gas Energy

Summary of Comparable Midwestern Gas Companies

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]	[L]	[M]	[N]	[O]	[P]	[Q]	[R]	[S]	[T]
	Applied Depreciation Rate													AmerenUE					
	No. Indiana Public	K N	ONEOK (Western Resources)						Atmos Energy Corp. (United Cities Gas Company)		Missouri Public Service			Estimated		Applied	Mortality		
Account Description	Service Co.	Energy	Rate	Type of Analysis	Life Basis	Rate	Type of Analysis	Rate	Iowa	Missouri	Rate	Type of Analysis	Life Basis	Average Service Life	Net Salvage	Depreciation Rate	Curve Type	Type of Analysis	Life Basis
	Indiana	Kansas	Kansas			Oklahoma					Missouri			Missouri					
	%	%	%			%			%	%	%			Years	%	%			
Distribution																			
374	2.27	3.00	2.77	Actuarial	Whole Life														
375	2.27	3.00	2.86	Actuarial	Whole Life	3.04	Actuarial	Whole Life	0.00		2.76	Actuarial	Whole Life	49.0	0.00	2.04	R-3	Actuarial	Whole Life
376	3.75	3.00	2.48	Actuarial	Whole Life	1.93	Actuarial	Whole Life	2.47		2.40	Actuarial	Whole Life	44.0	(10.00)	2.50	R-3	Actuarial	Whole Life
378	3.43	3.00	3.65	Actuarial	Whole Life	3.16	Actuarial	Whole Life	4.72		2.40	Actuarial	Whole Life	38.0	0.00	2.61	R-3	Actuarial	Whole Life
379		3.00	3.48	Actuarial	Whole Life	2.40	Actuarial	Whole Life	7.75		2.40	Actuarial	Whole Life	38.0	0.00	2.61	R-3	Actuarial	Whole Life
380	7.00	3.00	4.65	Actuarial	Whole Life	6.67	Actuarial	Whole Life	10.45		4.68	Actuarial	Whole Life	44.0	(79.00)	4.06	R-3	Actuarial	Whole Life
381	3.46	3.00	2.37	Actuarial	Whole Life	2.20	Actuarial	Whole Life	3.09		1.67	Actuarial	Whole Life	45.4	0.00	2.20	R-2	Actuarial	Whole Life
382	16.55	3.00	2.40	Actuarial	Whole Life	1.90	Actuarial	Whole Life	6.01		2.00	Actuarial	Whole Life						
383	9.94	3.00	2.47	Actuarial	Whole Life	1.74	Actuarial	Whole Life	4.33		2.50	Actuarial	Whole Life	65.8	0.00	1.52	L-2	Actuarial	Whole Life
384	7.83	3.00									2.70	Actuarial	Whole Life						
385	3.51	3.00							4.62		2.22	Actuarial	Whole Life	33.0	0.00	3.05	R-3	Actuarial	Whole Life
386	17.90	3.00																	
387		3.00	5.26	Actuarial	Whole Life	2.46	Actuarial	Whole Life	5.78										
Total	5.62	3.00	3.26	Actuarial	Whole Life				5.27										
General																			
390	2.78	2.50	2.37	Actuarial	Whole Life	3.05	Actuarial	Whole Life	2.52		2.00	Actuarial	Whole Life			2.13			Whole Life
391	7.37	7.50	12.31	Actuarial	Whole Life	2.38	Actuarial	Whole Life	7.58		[3]	Actuarial	Whole Life	[7]	[7]	[7]		Actuarial	Whole Life
392	6.27	[6]	6.13	Actuarial	Whole Life	7.89	Actuarial	Whole Life			[4]	Actuarial	Whole Life	12.5	12.00	7.04		Actuarial	Whole Life
393	2.35	7.50	3.68	Actuarial	Whole Life	4.21	Actuarial	Whole Life	2.91		7.14	Actuarial	Whole Life	50.4	0.00	1.97		Actuarial	Whole Life
394	3.22	7.50	4.98	Actuarial	Whole Life	5.36	Actuarial	Whole Life	1.22		8.33	Actuarial	Whole Life	19.5	0.00	5.13		Actuarial	Whole Life
395	4.69	7.50	3.80	Actuarial	Whole Life	4.56	Actuarial	Whole Life	4.01		6.67	Actuarial	Whole Life	45.0	0.00	2.22		Actuarial	Whole Life
396		10.00	7.43	Actuarial	Whole Life	5.55	Actuarial	Whole Life	3.29		[5]	Actuarial	Whole Life	14.5	11.00	6.14		Actuarial	Whole Life
397	4.55	7.50	5.74	Actuarial	Whole Life	3.57	Actuarial	Whole Life	6.21		3.40	Actuarial	Whole Life	18.8	0.00	5.26		Actuarial	Whole Life
398	3.37	7.50	5.66	Actuarial	Whole Life	5.59	Actuarial	Whole Life			6.00	Actuarial	Whole Life						
Total	3.95		5.44	Actuarial	Whole Life				4.83										
Total	4.96		3.40			3.66			5.19										

[1] Office furniture is depreciated at 3.44% and computer equipment is depreciated at 12.3%.

[2] Transportation and power operated equipment is depreciated over anticipated useful lives of 5 - 10 years.

[3] Office furniture is depreciated at 7.0% and computer equipment is depreciated at 22.5%.

[4] Cars depreciated at 10.44%, light trucks at 9.6%, heavy trucks at 6% and trailers at 5.26%.

[5] Power operated equipment with short life depreciated at 13% and with long life at 5.56%.

[6] Transportation equipment is depreciated over anticipated useful lives of 5 - 10 years until anticipated salvage equals 20%.

[7] Office Furniture: ASL 23.9 years, 4.00% net salvage, depreciated at 4.01%; and computer equipment: ASL 9.0 years, 7.00% net salvage, depreciated at 10.33%.

Table 3-3

Missouri Gas Energy

Summary of Comparable Midwestern Gas Companies

[A]	[U]	[V]	[W]	[X]	[Y]	[Z]	[AA]	[AB]	[AC]	[AD]	[AE]	[AF]	[AG]	[AH]	[AI]	[AJ]	[AK]	[AL]
	Alliant Energy (Interstate Power Company)				Peoples Natural Gas							MidAmerican Energy (Iowa - Illinois Gas and Electric Company)						
Account Description	Estimated Average Service Life	Net Salvage	Applied Depreciation Rate	Average Remaining Life	Estimated Average Service Life	Net Salvage	Applied Depreciation Rate	Mortality Curve Type	Average Remaining Life	Type of Analysis	Life Basis	Estimated Average Service Life	Net Salvage	Applied Depreciation Rate	Mortality Curve Type	Average Remaining Life	Type of Analysis	Life Basis
	Iowa				Iowa							Iowa						
		%	%	Years	Years	%	%		Years			Years	%	%		Years		
Distribution																		
374												75.00		1.34	S6	52.80	SPB	Remain. Life
375	29.00		9.59	10.90	45.00	(10.00)	3.48	S4	30.89	Actuarial	Whole Life	55.00		1.83	R2	37.40	SPB	Remain. Life
376	42.00	(10.00)	2.35	29.00	40.00	(45.00)	3.48	R4	30.89	Actuarial	Whole Life	50.00	(15.00)	2.22	R3	33.30	SPB	Remain. Life
378	28.00		3.72	21.10	27.00	(5.00)	3.48	R2	30.89	Actuarial	Whole Life	35.00	(10.00)	3.57	R1	24.20	SPB	Remain. Life
379	26.00		3.68	14.40								35.00	(10.00)	2.86	R1	28.00	SPB	Remain. Life
380	26.00	(25.00)	4.65	17.20	36.00	(125.00)	3.48	S2	30.89	Actuarial	Whole Life	43.00	(90.00)	4.69	R4	27.00	SPB	Remain. Life
381	31.00	(40.00)	5.05	20.80	35.00	0.00	3.48	S4	30.89	Actuarial	Whole Life	35.00	10.00	2.94	S2	23.00	SPB	Remain. Life
382					38.00	(30.00)	3.48	R2	30.89	Actuarial	Whole Life							
383	32.00		3.34	23.20	29.00	0.00	3.48	S3	30.89	Actuarial	Whole Life	35.00		2.72	S2	22.20	SPB	Remain. Life
384					29.00	15.00	3.48	S4	30.89	Actuarial	Whole Life							
385	16.00		6.50	7.20	30.00	30.00	3.48	R2	30.89	Actuarial	Whole Life	25.00	5.00	4.24	S0	19.00	SPB	Remain. Life
386	35.00		0.00	10.80														
387	25.00		0.00	1.80	12.00	(20.00)	3.48	R1	30.89	Actuarial	Whole Life							
Total			3.61				3.48							3.06				
General																		
390																		
391	10.00		3.97	3.00		5.00	[1]	R4		Actuarial	Whole Life	40.00	5.00	2.25	S1	27.90	SPB	Remain. Life
392	11.74	10.26	7.49	6.75			[2]	R4		Actuarial	Whole Life	11.44	5.00	17.19	SQ	7.29	SPB	Remain. Life
393	35.00		1.98	2.90														
394	24.00		4.67	16.80		5.00		R4		Actuarial	Whole Life	20.00	13.00	5.53	SQ	14.40	SPB	Remain. Life
395	22.00		4.56	16.50								25.00	5.00	4.00	SQ	18.00	SPB	Remain. Life
396	13.00	30.00	4.53	6.60		40.00	[2]	R4		Actuarial	Whole Life	25.00		5.05	SQ	17.00	SPB	Remain. Life
397	30.00		2.62	15.60														
398	13.00		16.25	7.30								20.00		5.50	SQ	10.70	SPB	Remain. Life
Total			5.49									20.00		4.53	SQ	12.00	SPB	Remain. Life
														3.06				
Total			3.72											3.06				

[1] Office furniture is depreciated at 3.44% and computer equipment is depreciated at 12.3%.
[2] Transportation and power operated equipment is depreciated over anticipated useful lives of 5 - 10 years.
[3] Office furniture is depreciated at 7.0% and computer equipment is depreciated at 22.5%.
[4] Cars depreciated at 10.44%, light trucks at 9.8%, heavy trucks at 6% and trailers at 5.28%.
[5] Power operated equipment with short life depreciated at 13% and with long life at 5.56%.
[6] Transportation equipment is depreciated over anticipated useful lives of 5 - 10 years until anticipated salvage equals 20%.
[7] Office Furniture: ASL 23.9 years, 4.00% net salvage, depreciated at 4.01%; and computer equipment: ASL 9.0 years, 7.00% net salvage, depreciated at 10.33%.

Table 3-3

Missouri Gas Energy

Summary of Comparable Midwestern Gas Companies

[A]	[AM]	[AN]	[AO]	[AP]	[AQ]	[AR]	[AS]	[AT]	[AU]	[AV]	[AW]	[AX]	[AY]	[AZ]	[BA]	[BB]	[BC]
	MidAmerican Energy (Midwest Gas)							Alliant Energy (IES)				LaClede			Average		
Account Description	Estimated Average Service Life	Net Salvage	Applied Depreciation Rate	Mortality Curve Type	Average Remaining Life	Type of Analysis	Life Basis	Estimated Average Service Life	Net Salvage	Applied Depreciation Rate	Average Remaining Life	Estimated Average Service Life	Net Salvage	Applied Depreciation Rate	Estimated Average Service Life	Net Salvage	Applied Depreciation Rate
	Iowa							Iowa				Missouri					
	Years	%	%		Years			Years	%	%	Years	Years	%	%	Years	%	%
Distribution																	
374																	
375	44.00	(54.21)	3.51	R2	34.14	SPB	Remain. Life								75		2.35
376	64.00	(54.21)	2.41	R1.5	52.29	SPB	Remain. Life					78.42	(13.69)	1.27	50	(19)	2.97
378	56.00	(54.21)	2.75	R1.5	45.40	SPB	Remain. Life					71.35	(21.68)	1.98	52	(26)	2.58
379	56.00	(54.21)	2.75	R1.5	45.40	SPB	Remain. Life					35.00	(29.00)	2.02	37	(20)	3.21
380	37.00	(54.21)	4.16	R3	26.03	SPB	Remain. Life					47.00	(5.00)	2.35	40	(18)	3.35
381	42.00	(54.21)	3.66	R2	29.17	SPB	Remain. Life					44.15	(21.58)	4.67	39	(56)	5.20
382	42.00	(54.21)	3.66	R2	29.17	SPB	Remain. Life					35.00	1.00	2.86	37	(14)	3.00
383	50.00	(54.21)	3.08	R0.5	41.57	SPB	Remain. Life								40	(42)	4.66
384	50.00	(54.21)	3.10	R0.5	41.57	SPB	Remain. Life					41.00	0.00	2.44	42	(14)	3.38
385	56.00	(54.21)	2.75	R1.5	45.40	SPB	Remain. Life								40	(20)	4.02
386												28.00	(8.00)	3.13	31	(5)	3.65
387															35		6.97
Total			3.13					43.00	(29.95)	4.01	24.00	28.00	(206.00)	16.67	22	(113)	5.24
General																	
390	30.00	16.80	2.36	R3	27.35	SPB	Remain. Life										
391	18.00	16.80	3.54	S3	15.63	SPB	Remain. Life					50.00	0.00	2.00	40	7	2.40
392	7.00	16.80	10.51	S0	4.04	SPB	Remain. Life					15.10	0.13	9.65	14	7	7.94
393	32.00	16.80	(5.55)	S2	10.67	SPB	Remain. Life					9.80	5.96	10.45	10	11	8.25
394	33.00	16.80	1.65	S0	28.13	SPB	Remain. Life					37.00	6.00	3.46	35	9	3.20
395	25.00	16.80	0.73	S2	16.56	SPB	Remain. Life					42.00	1.00	3.38	29	6	4.51
396	13.00	16.80	1.18	L1	8.50	SPB	Remain. Life					22.00	0.00	3.45	28	6	4.29
397	16.00	16.80	4.28	S0	14.35	SPB	Remain. Life					12.00	5.05	8.95	13	21	5.88
398	30.00	16.80	2.49	L1	26.08	SPB	Remain. Life					16.00	0.00	3.73	20	6	4.76
Total			3.72					19.00	8.08	1.70	7.00	26.00	3.00	3.45	22	10	6.12
Total			3.23														

[1] Office furniture is depreciated at 3.44% and computer equipment is depreciated at 12.3%.
[2] Transportation and power operated equipment is depreciated over anticipated useful lives of 5 - 10 years.
[3] Office furniture is depreciated at 7.0% and computer equipment is depreciated at 22.5%.
[4] Cars depreciated at 10.44%, light trucks at 9.8%, heavy trucks at 8% and trailers at 5.28%.
[5] Power operated equipment with short life depreciated at 13% and with long life at 5.56%.
[6] Transportation equipment is depreciated over anticipated useful lives of 5 - 10 years until anticipated salvage equals 20%.
[7] Office Furniture: ASL 23.9 years, 4.00% net salvage, depreciated at 4.01%; and computer equipment: ASL 9.0 years, 7.00% net salvage, depreciated at 10.33%.

Properties from these utilities include facilities located in Missouri, Kansas, Iowa, Indiana, and Oklahoma.

At the Staff's request, we attempted to expand our analysis from that contained in our 1995 report with additional information regarding the basis for the rates for each of the utilities. In Columns BA through BC of Table 3-3, we calculate a regional industry average of the average service life, net salvage percentage, and annual depreciation rate to compare against MGE's existing rates. There will be some differences between the depreciation rates and the rates that would result from a whole life calculation using the average service lives and net salvage values shown because some of the utilities did not provide net salvage figures and some utilities use a remaining life calculation.

We considered these averages in determining our recommended rates. In general, our recommended accrual rates for distribution plant accounts are conservative (low) when compared with the industry averages. For general plant accounts, our recommended rates are slightly higher than industry averages.

3.4 Net Salvage Allowances

Based on our December 1998 meeting with the Staff, the Staff testimony filed in the 1998 LaClede case, and our recent experience with other depreciation rate studies, we have incorporated consideration of net salvage for distribution facilities in our recommended depreciation rates in a manner that differs somewhat from the traditional approach.

The traditional approach for incorporating allowance for net salvage is to compare annual net salvage (salvage minus cost of removal) to the original cost of the plant retired during that year over a representative historical period, preferably at least 10 years. The traditional approach assumes that the ratio of net salvage dollars to the original cost dollars of the retirements is representative of the allowance that will ultimately apply to all plant in service over that life of that asset. In a whole life depreciation calculation, this allowance is then added to (for a net cost of removal) or deducted from (for a net salvage) one in the numerator and then divided by the average service life.

This approach provides reasonable results where there are modest amounts of salvage or cost of removal or where the amounts are fairly consistent (such as for unit property or general plant). However, cost of removal for some natural gas distribution plant can be as much as or more than the original cost of the plant retired especially if natural gas lines that are under streets need to be relocated. In these instances, it may not be reasonable to assume that this experience applies to all plant.

Problems may result (especially with mains and services) if the net salvage allowance is large and a relatively small amount of plant is being retired. A large depreciation reserve may be accumulated in anticipation of cost of removal expenses that may or may not occur. In the

LaClede case, the Staff believed that this was at the root of large differences between actual and theoretical reserve. The Staff proposed to remove salvage from the depreciation calculation and treat cost of removal as a separate cost (or revenue requirement).

However, we believe that the goal of matching actual cost of removal expenses and cost of removal allowances can be accomplished within the calculation of depreciation rates. For example, we analyzed MGE's salvage costs and cost of removal over the 1988 through 1998 period and found that the annual net salvage amounts are fairly consistent. In Table 3-4, Column H, we show estimates of a "normal" annual allowance for distribution accounts. The depreciation rates recommended in Column J are based on producing an annual dollar amount equal to these allowances. Rather than developing a net salvage allowance based on the ratio of net salvage to the original cost of the plant retired, the ratio is based on the ratio of an annual allowance to total plant in service.

It could be argued that this annual allowance approach is an "impure" application of the "whole" life perspective because it is based on a rather short term analysis of activity. As plant ages and retirement activity increases, it would be expected that the annual allowance should be increased over time. Insufficient depreciation reserve might be accumulated if the annual allowance is not reviewed on a regular basis. However, in Missouri, depreciation rates are reviewed every five years as required by Commission rule. This frequency will allow for adjustment of the annual allowance to reflect changes in activity, if necessary.

In Table 3-4, Column H, we did not extend this annual allowance approach to general plant accounts. Typically, general plant has either no net salvage or a positive net salvage. Also, the salvage amounts of general plant is generally modest and fairly consistent and is frequently associated with shorter lived assets (such as vehicles and computers) where there is a better defined "used" market.

3.4.1 Account 376

As shown in Table 3-4, Column H, we have allowed a positive salvage amount of $450,000 per year for Account 376, Mains. The Company's historical practice with regard to reimbursements for line relocations has been to credit (increase) reserve for the amount of reimbursement. An alternative method would be to credit (decrease) depreciable plant for the amount of the reimbursement. Although both of these methods have the same effect of reducing net plant, there is a significant difference in depreciable plant and the appropriate depreciation rate between the two methods.

All other things being equal, crediting reserve for the amount of the reimbursement should result in a lower depreciation rate being applied to a larger plant in service, whereas crediting plant for the amount of the reimbursement should result in a higher depreciation

Table 3-4
Missouri Gas Energy
Existing and Proposed Accrual Rates

[A] Acct. No.	[B] Account	[C] Existing Annual Accrual Rate	[D] Depreciable Plant 12/31/1998	[E] Existing Annual Depreciation Expense	[F] Accumulated Depreciation Reserve	[G] Reserve Ratio	[H] Net Salvage Allowance	[I] Proposed Average Service Life	[J] Proposed Accrual Rate	[G] Proposed Depreciation Expense
		%	$	$	$	%	(1)	Years	%	$
	Distribution Plant									
3742	Land Rights	2.17%	893,182	19,382	212,119	23.75%	0	50	2.00%	17,864
3751	Structures	2.28%	5,738,444	130,837	1,161,780	20.25%	15,000	50	1.74%	99,769
3760	Mains	1.88%	242,567,793	4,560,275	72,474,929	29.88%	450,000	40	2.31%	5,614,195
3780	Measuring & Regulating Stations	3.00%	10,163,614	304,908	2,348,188	23.10%	(5,000)	30	3.38%	343,787
3790	City Gate Stations	2.66%	2,686,494	71,461	523,090	19.47%	1,000	40	2.46%	66,162
3800	Services	5.50%	223,017,129	12,265,942	81,509,178	36.55%	(720,000)	30	3.66%	8,153,904
3810	Meters	2.05%	25,113,112	514,819	1,814,317	7.22%	(2,500)	35	2.87%	720,017
3820	Meter/Regulator Installations	2.05%	42,168,249	864,449	5,362,806	12.72%	(15,000)	35	2.89%	1,219,807
3830	Regulators	2.05%	9,219,139	188,992	1,467,656	15.92%	1,000	40	2.49%	229,478
3850	EGM-Meas/Reg Equip	5.00%	255,152	12,758	9,955	3.90%	0	20	5.00%	12,758
3870	Other Equipment	6.33%	0	0	0	0.00%	0	35	2.86%	0
	Total Distribution Plant	3.37%	561,822,308	18,933,822	166,884,016	29.70%	(275,500)		2.93%	16,477,742
	General Plant									
3901	Structures & Improvements	3.33%	439,273	14,628	125,746	28.63%	40%	35	1.71%	7,530
3910	Furniture & Equipment	3.06%	3,196,378	97,809	(575,380)	-18.00%	0%	10	10.27%	328,268
3920	Transportation Equipment	10.13%	2,689,553	272,452	579,306	21.54%	10%	8	11.25%	302,575
3930	Stores Equipment	3.33%	527,647	17,571	186,766	35.40%	0%	20	5.00%	26,382
3940	Tools	4.00%	4,310,432	172,417	1,123,483	26.06%	0%	10	10.00%	431,043
3960	Power Operated Equipment	6.25%	1,134,135	70,883	92,974	8.20%	20%	10	8.00%	90,731
3970	Communication Equipment	4.50%	2,036,629	91,648	(406,340)	-19.95%	0%	15	6.67%	135,775
3971	Electronic Reading-ERT	5.00%	30,865,129	1,543,256	1,369,709	4.44%	0%	20	5.00%	1,543,256
3980	Miscellaneous Equipment	6.25%	161,119	10,070	55,943	34.72%	0%	20	5.00%	8,056
	Total General Plant	5.05%	45,360,295	2,290,735	2,552,209	5.63%			6.34%	2,873,617
	Total Depreciable Plant	3.50%	607,182,602	21,224,557	169,436,225	27.91%			3.19%	19,351,359

(1) $/year salvage allowance or percent of plant.

(2) Proposed accrual rate of 10.27% for Account 391 is based on accrual rate determined for corporate Acct. 391.

Table 3-5
Missouri Gas Energy
Alternative Treatments of Reimbursements

[A]	[B]	[C]	[D]	[E]	[F]	[G]
	Utility 1			Utility 2 (MGE)		
Year	Gross Plant	Accumulated Depreciation	Net Plant	Gross Plant	Accumulated Depreciation	Net Plant
	(1)	(3) 3.33% 30		(2)	(4) 3.00% 33	
1970	900	0	900	1,000	100	900
1971	900	30	870	1,000	130	870
1972	900	60	840	1,000	160	840
1973	900	90	810	1,000	190	810
1974	900	120	780	1,000	220	780
1975	900	150	750	1,000	250	750
1976	900	180	720	1,000	280	720
1977	900	210	690	1,000	310	690
1978	900	240	660	1,000	340	660
1979	900	270	630	1,000	370	630
1980	900	300	600	1,000	400	600
1981	900	330	570	1,000	430	570
1982	900	360	540	1,000	460	540
1983	900	390	510	1,000	490	510
1984	900	420	480	1,000	520	480
1985	900	450	450	1,000	550	450
1986	900	480	420	1,000	580	420
1987	900	510	390	1,000	610	390
1988	900	540	360	1,000	640	360
1989	900	570	330	1,000	670	330
1990	900	600	300	1,000	700	300
1991	900	630	270	1,000	730	270
1992	900	660	240	1,000	760	240
1993	900	690	210	1,000	790	210
1994	900	720	180	1,000	820	180
1995	900	750	150	1,000	850	150
1996	900	780	120	1,000	880	120
1997	900	810	90	1,000	910	90
1998	900	840	60	1,000	940	60
1999	900	870	30	1,000	970	30
2000	900	900	0	1,000	1,000	0
Retirement	(900)	(900)		(1,000)	(1,000)	

(1) Initial gross plant is $1,000 minus $100 reimbursement.
(2) Initial accumulated depreciation equals $100 reimbursement.
(3) Depreciation rate equals (1-0)/30 = 3.33 percent.
(4) Depreciation rate equals (1-.1)/30 = 3.00 percent.

rate being applied to a lower plant in service. Table 3-5 is an example of how both approaches result in the same net plant and depreciation expense over the life of the asset.

In MGE's case, the net effect of the reimbursements is to increase net salvage (salvage minus cost of removal, only) approximately $450,000 per year. In other words, if MGE had been crediting plant in service for reimbursements, the net salvage allowance would be zero rather than a positive $450,000 per year. This produces a higher depreciation rate that is applied to a smaller depreciable plant. This distinction is important to note when comparing MGE's depreciation rate for Account 376 to other companies. It would not be appropriate to compare another company's depreciation rate with that of MGE if that company is crediting reimbursements to plant or using some other approach.

3.5 *Recommended Accrual Rates*

Table 3-4 summarizes the Company's existing and recommended accrual rates and the annual depreciation expense incurred when each of these rates is applied to the depreciable plant balance.

We show in Table 3-4 that when our recommended accrual rates in Column J are applied to depreciable plant balances as of December 31, 1998, annual depreciation expense would decrease by $1.87 million under levels produced by existing rates. This $1.87 million decrease is primarily due to six of the Company's accounts whose annual accrual rates appear to be unreasonable on a relative basis. Based on consideration of the simulated plant analysis, industry averages, and our experience with gas (and other) utility property, the following discussion explains in further detail our basis for recommending change to these six particular accounts:

- For Account 376-Mains, we recommend an average service life of 40 years and an annual net salvage allowance of $450,000. This increases the annual accrual rate from 1.88 percent to 2.31 percent. The 40 year average service life is consistent with the simulated plant balance analysis and results in a rate closer to industry averages (2.58 percent).
- For Account 380-Services, the existing rate is too high. We recommend an accrual rate of 3.66 percent as opposed to the existing 5.50 percent. The Company has been in the process of a significant services replacement program. Our experience is that a 30 year average service life for services is not unreasonable. While the calculated industry average for services is 5.20 percent, this figure is inflated by abnormally high values for three utilities (Northern Indiana PSC – 7.00 percent, ONEOK (Oklahoma) – 6.67 percent, and Atmos Energy Corp. (Iowa) – 10.45 percent). Excluding

these three utilities results in an industry average of 4.25 percent, which is more in line with our recommendation.

- For Account 381-Meters and Account 382-Regulators, the existing rates are too low (2.05 percent). We recommend a 35 year average service life for both accounts, and a net salvage allowance of negative $2,500 for Account 381 and negative $15,000 for Account 382. This results in recommended accrual rates of 2.87 percent for Account 381 and 2.89 percent for Account 382.
- The existing rate for the Account 391-Furniture and Equipment is too low and fails to recognize the shorter life of computer and other office equipment. We recommend changing the existing rate of 3.06 percent to 10.27 percent, which is based on the accrual rate determined for Southern Union corporate plant.
- The existing rate (4 percent) for the Account 394-Tools is too low and implies an average service life of 25 years. We recommend an average service life of 10 years, or a 10 percent accrual rate.

As mentioned above, the accrual rate for Account 391 is based on our analysis of Southern Union corporate plant. Table 3-6 summarizes existing and proposed rates under whole life and remaining life methodologies for Southern Union corporate general plant. While this table appears to show rates developed using both the whole and remaining life methodologies, all of the recommended rates for Southern Union's corporate plant are based on a whole life method.

The only corporate account with any significant investment is Account 391 - Office Furniture and Equipment. The development of the 10.27 percent rate for Account 391 is based on the detailed plant components of that account on a total Company basis, as shown in Table 3-7. The rate is a dollar weighted average rate intended to be used for all assets booked to Account 391.

Table 3-6
Southern Union Company
Corporate (Co. 20) Existing and Recommended Depreciation Rates
Using Whole and Remaining Life Methodology

[A]	[B]	[C]	[D]	[E]	[F]	[G]		[H]	[I]		[J]
						Whole Life Method			Remaining Life Method		
Account No.	Depreciable Plant 12/31/98	Existing Annual Depreciation Expense	Existing Annual Accrual Rate	Accumulated Depreciation Reserve	Reserve Ratio	Whole Life Rate		Depreciation Expense	Remaining Life Rate		Depreciation Expense
	$	$	%	$	%	%		$			$
390	742,817	21,044	2.83%	472,006	64%	2.75%		20,427	2.75%	(3)	20,427
391	20,594,145	2,059,415	10.00%	6,648,495	32%	10.27%	(2)	2,115,007	10.27%	(3)	2,115,007
392	113,054	14,132	12.50%	102,030	90%	10.60%		11,982	10.60%	(3)	11,982
393	2,201	220	10.00%	(4,275)	-194%	0.00%		0	0.00%	(3)	0
394	21,652	613	2.83%	358	2%	3.33%		722	3.33%	(3)	722
397	289,428	8,199	2.83%	61,332	21%	6.67%		19,295	6.67%	(3)	19,295
398	160,627	4,551	2.83%	75,050	47%	5.00%		8,031	5.00%	(3)	8,031
Total	21,923,925	2,108,174	9.62%	7,354,995	34%	9.92%		2,175,464	9.92%		2,175,464

(1) Existing rate
(2) Weighted whole life rate for Account 391.
(3) Use whole life rates.

Table 3-7
Missouri Gas Energy
Calculation of Whole Life Rate for Account 391
Southern Union Corporate

[A]	[B]	[C]	[D]	[E]	[F]
Description	Total	Percent of Total	Net Salvage	Average Service Life	Whole Life Rate
	$			Years	
Account 391.1 - Furniture	4,299,354	11.30%	10.00%	25	3.60%
Account 391.2 - Office Equipment	1,450,560	3.81%	0.00%	10	10.00%
Account 391.3 - Mainframe	22,062,586	57.98%	20.00%	10	8.00%
Account 391.4 - Personal Computer	10,239,092	26.91%	10.00%	5	18.00%
Total	38,051,592	100.00%			
Weighted Rate for Account 391					10.27%

Schedule 1-22

4.0 Depreciation Reserve

After recommending accrual rates, depreciation reserve is recalculated to determine the theoretical level that should have been accumulated had these rates been in effect. Without adjustment, to the extent that calculated reserve is greater than or less than the book reserve, the Company will under- or over-recover, respectively, its depreciable plant investment. The purpose of an amortization adjustment to a depreciation rate is to preclude the Company from recovering through depreciation accruals, amounts in excess or below its plant investment basis. This amortization also limits recovery from customers to the capital investment used to serve them during the period of service of each investment. Differences between the calculated theoretical reserve and the book reserve can be attributed primarily to changes in life characteristics or historical rates which have not properly reflected life characteristics or changes in life characteristics. These changing life characteristics and the degree to which these changes are recognized and reflected in the depreciation rates directly affect the book reserves.

The calculated theoretical level of depreciation of reserves for the Company was not studied in our analysis. A detailed analysis of reserve relies generally upon the same data used by the survivor curve analysis. However, even without performing this detailed analysis, certain observations can be made regarding MGE's accumulated depreciation and its relationship to the expected service life of each account.

First, there are two accounts with negative reserve balances, Accounts 391 and 397. This might be caused by several factors, including depreciation rates that are too low. As we discussed in Chapter 3, this is true for Account 391. Second, the reserve ratio for Account 380-Services is relatively high compared to the other accounts. Based on these two observations, we recommend a redistribution of reserve balance from Account 380 to other accounts.

Table 4-1 presents our analysis of accumulated depreciation reserve. Column H shows the estimated weighted average dollar age of surviving plant for each account. This average age is divided by the recommended average service life to provide an estimate of the relative theoretical reserve ratios for each account (Column I). Calculated reserve minus actual reserve provides an estimate of how reserve may be redistributed. The actual amount redistributed from Account 380 to the other accounts is shown in Column L. The net effect of the redistribution is zero. The resultant accumulated depreciation reserve and reserve ratios are shown in Columns M and N, respectively.

Table 4-1
Missouri Gas Energy
Analysis of Accumulated Depreciation Reserve

[A] Acct. No.	[B] Account	[C] Existing Annual Accrual Rate	[D] Depreciable Plant 12/31/1998	[E] Existing Annual Depreciation Expense	[F] Accumulated Depreciation Reserve	[G] Proposed Depreciation Expense	[H] Weighted Age	[I] Calculated Reserve Ratio Based On Weighted Age	[J] Calculated Depreciation Reserve	[K] Actual Less Calculated Reserve	[L] Redistribute Services to Deficient Accounts	[M] Restated Accumulated Depreciation Reserve	[N] Restated Reserve Ratio
		%	$	$	$	$	Years	%	$	$	$	$	%
	Distribution Plant												
3742	Land Rights	2.17%	893,182	19,382	212,119	17,864	15	30.00%	267,955	(55,836)	0	212,119	23.75%
3751	Structures	2.28%	5,738,444	130,837	1,161,780	99,769	13	26.00%	1,491,995	(330,216)	200,000	1,361,780	23.73%
3760	Mains	1.88%	242,567,793	4,560,275	72,474,929	5,614,195	15	37.50%	90,962,922	(18,487,993)	10,000,000	82,474,929	34.00%
3780	Measuring & Regulating Stations	3.00%	10,163,614	304,908	2,348,188	343,787	10	33.33%	3,387,871	(1,039,684)	700,000	3,048,188	29.99%
3790	City Gate Stations	2.66%	2,686,494	71,461	523,090	66,162	8	20.00%	537,299	(14,209)	0	523,090	19.47%
3800	Services	5.50%	223,017,129	12,265,942	81,509,178	8,153,904	6	26.67%	59,471,234	22,037,944	(22,000,000)	59,509,178	26.68%
3810	Meters	2.05%	25,113,112	514,819	1,814,317	720,017	14	40.00%	10,045,245	(8,230,928)	4,100,000	5,914,317	23.55%
3820	Meter/Regulator Installations	2.05%	42,168,249	864,449	5,362,806	1,219,807	7	20.00%	8,433,650	(3,070,844)	1,500,000	6,862,806	16.27%
3830	Regulators	2.05%	9,219,139	188,992	1,467,656	229,478	9	22.50%	2,074,306	(606,650)	400,000	1,867,656	20.26%
3850	EGM-Meas/Reg Equip	5.00%	255,152	12,758	9,955	12,758					0	9,955	3.90%
3870	Other Equipment	6.33%	0	0	0	0	0	0.00%	0	0	0	0	0.00%
	Total Distribution Plant	3.37%	561,822,308	18,933,822	166,884,016	16,477,742			176,672,478	(9,798,416)	(5,100,000)	161,784,016	28.80%
	General Plant												
3901	Structures & Improvements	3.33%	439,273	14,628	125,746	7,530	21	60.00%	263,564	(137,818)	100,000	225,746	51.39%
3910	Furniture & Equipment	3.06%	3,196,378	97,809	(575,380)	328,268	9	92.43%	2,954,412	(3,529,792)	2,000,000	1,424,620	44.57%
3920	Transportation Equipment	10.13%	2,689,553	272,452	579,306	302,575	2	25.00%	672,388	(93,082)	50,000	629,306	23.40%
3930	Stores Equipment	3.33%	527,647	17,571	186,766	26,382	12	60.00%	316,598	(129,822)	100,000	286,766	54.35%
3940	Tools	4.00%	4,310,432	172,417	1,123,483	431,043	9	90.00%	3,879,389	(2,755,905)	1,500,000	2,623,483	60.86%
3960	Power Operated Equipment	6.25%	1,134,135	70,883	92,974	90,731	9	90.00%	1,020,721	(927,747)	500,000	592,974	52.28%
3970	Communication Equipment	4.50%	2,036,629	91,648	(406,340)	135,775	5	33.33%	678,876	(1,085,216)	750,000	343,660	16.87%
3971	Electronic Reading-ERT	5.00%	30,865,129	1,543,256	1,369,709	1,543,256	1	5.00%	1,543,256	(173,547)	100,000	1,469,709	4.76%
3980	Miscellaneous Equipment	6.25%	161,119	10,070	55,943	8,056	6	30.00%	48,336	7,607	0	55,943	34.72%
	Total General Plant	5.05%	45,360,295	2,290,735	2,552,209	2,873,617			11,377,531	(8,825,322)	5,100,000	7,652,209	16.87%
	Total Depreciable Plant	3.50%	607,182,602	21,224,557	169,436,225	19,351,359			188,050,009	(18,623,739)	0	169,436,225	27.91%

SCHEDULE 2

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HIGHLY

CONFIDENTIAL IN

ITS ENTIRETY

SCHEDULE 3

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HIGHLY

CONFIDENTIAL IN

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SCHEDULE 4

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