Exhibit No.:
Issue: "Termination of Service"

Witness/Type of Exhibits: Levesque Rebuttal

Sponsoring Party: KCPL
Case No.: HO-86-139

REBUTTAL TESTIMONY OF

Robert W. Levesque

ON BEHALF OF

KANSAS CITY POWER & LIGHT COMPANY

CASE NO. HO-86-139

REBUTTAL TESTIMONY
OF
ROBERT W. LEVESQUE
Manager of Budgets & Valuation Engineering

Case No. HO-86-139

Q. PLEASE STATE YOUR NAME AND BY WHOM YOU ARE EMPLOYED?

A. Robert W. Levesque, and I am employed by Kansas City Power & Light Company.

Q. PLEASE STATE YOUR TITLE AND CREDENTIALS.

A. I am Manager of Budgets and Valuation Engineering. I hold the Bachelor of Engineering degree from the Polytechnic Institute of Brooklyn, and the Master of Business Administration from the Syracuse University. I am registered as a Professional Engineer in New York, Missouri, Kansas and Colorado.

Q. MR. LEVESQUE, WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The primary purpose of my rebuttal testimony is to show where testimony filed by Staff Consultant Derick Dahlen dealing with a proposed Long Range Rehabilitation Program has seriously underestimated the cost of steam to Downtown customers. Mr. Dahlen initially estimated $9.97/mlb. for 1987. Upon further review and after discussion with us and review of documentation provided to him and Staff Consultant Robert Miller, we understand that he will be revising his estimates upwards. Any increase moves him closer to a more reasonable estimate. KCPL believes that a conservative estimate of $17.26/mlb. results from calculations that include all the appropriate factors. My testimony reviews Mr. Dahlen's estimates on

an item by item basis in a supplemental study, Appendix A. My testimony also addresses site location and installation aspects of comparing gas and electric boilers, some aspects of natural gas fuel prices, and the inadequacies we perceive in the proposed Short Term Rehabilitation program.

Q. MR. LEVESQUE HAVE YOU COME TO ANY CONCLUSIONS REGARDING STAFF CONSULTANT DAHLEN'S DISTRICT STEAM HEAT SCENARIOS, PARTICULARLY THE LONG TERM REHABILITATIONS.

A. Yes, we have. When adjustments are made to Mr. Dahlen's assumptions to cover certain discrepancies, inconsistencies, and omissions that he and Staff Consultant Miller made, we find that Mr. Dahlen has done a remarkably good job of justifying a steam heat rate increase! In effect, our calculations and Mr. Dahlen's estimates both conclude the need for a rate increase regardless of whether KCPL or a hypothetical purchaser operates the system. As noted in our conversion plan and Mr. Beaudoin's testimony, continuing to operate the central heat system including renovation would require a current retail steam price of $26.80/mlb., and for purposes of this case, KCPL has stipulated, on a dollar basis only, to a $3.2 million (66%) revenue deficiency. When we corrected Mr. Dahlen's initial estimates, we find that a steam price of at least $17.26/mlb. can be justified. Gross receipt tax in Missouri would increase these and similar steam rates by 11.11%. In this instance, the price the consumer pays would be $19.18/mlb. As noted elsewhere, the current average steam price of approximately $10.00/mlb. to Downtown customers is clearly inadequate. In effect, Mr. Dahlen agrees. Thus, I conclude that Mr. Dahlen's analysis helps to justify this 66% increase in steam rates.

Q. MR. LEVESQUE, WHAT DISCREPANCIES, INCONSISTENCIES, AND OMISSIONS ARE YOU REFERRING TO?

A. These items are identified and detailed in our study attached as Appendix A. They are summarized here as follows:

1. Staff Consultant Miller significantly underestimated the costs to operate and maintain the steam distribution system (O&M), whether partially replaced or not. We find that the 15 employees we currently have maintaining the system is a good reference point. With the efficiencies of a rehabilitated distribution system, the manpower could be at a level of no less than 10. The 3 employees initially estimated by Mr. Miller would be inadequate. We have discussed this item with Mr. Miller and provided him with some operational experience data and estimates of labor requirements. Of particular note is the expected impact of dealing with asbestos insulation on some of the distribution piping.

2. Staff Consultant Dahlen neglected to include a return of, or a return on, the current KCPL net plant ($5.5 million), although he continues to make use of Grand Avenue and the existing steam distribution system in both the Long Range and Short Range Scenarios. KCPL is unwilling to ascribe to a zero plant value.

3. Mr. Dahlen's base 1987 natural gas price of $2.18/MMBTU is far below the actual price being paid for gas at Grand Avenue Station. KCPL's forecast for 1987, namely $3.63, is more in line with the prices that are expected to be charged by KPL Gas Service Co. We corrected Mr. Dahlen's estimates

to this more realistic figure and believe he should be reflecting these DRI based gas price forecasts.

4. Mr. Dahlen, apparently using estimates prepared by Mr. Miller, underestimated the amount of electricity required to run electric auxiliaries at Grand Avenue Station (GAS). We investigated this matter thoroughly and determined the electric consumption of selected equipment at GAS. We also were able to establish the auxiliary consumption at a local major chemical company facility with gas-fired boilers of comparable size to boilers proposed at GAS and have made adjustments that reflect their experience in our calculations.

5. Mr. Dahlen initially neglected to include property taxes. Property taxes will be due on both any new investment and the original investment. We shared some property tax assessments and abandonment data with Mr. Dahlen to be used in adjusting his estimates.

6. Mr. Miller computed distribution system losses based on an allocation of current losses by the amount of radiation losses computed for each of the low and high pressure distribution systems. Then he appears to have discarded the losses that he associated with the low pressure system. Apparently he failed to realize that the "other than radiation" losses occur mostly on the customers' premises or are steam leaks which will continue to occur even if new distribution is installed. Again, we discussed this with Messrs. Miller and Dahlen and provided actual measurement data.

The impact on steam rates for each of these and other discrepancies has been identified in our study which is contained in Appendix A, which was prepared under my direct supervision and control. They total $7.29/mlb. Mr. Dahlen's model was recreated in the study contained in Appendix A and then adjusted for each of these discrepancies, inconsistencies, and omissions. Appendix A, Exhibit 1. Thus, we believe Staff should be estimating a 1987 Downtown Steam price of $17.26/mlb rather than the $9.97/mlb. orginally estimated in the Long Term Rehabilitation Scenario. In other words, were the Long Term Scenario operating today the price of steam would be about $17.26/mlb.

Q. MR. LEVESQUE, HOW DOES NATIONAL STARCH AFFECT THIS SITUATION?

A. With great impact. The above stated steam rates include National Starch as a large wholesale customer. Without National Starch, and that will be the case when its contract ends in 1990, the situation can only get worse. By worse, I mean that the price of steam to retail customers will increase dramatically. This is shown in Mr. Dahlen's second (or no National Starch) scenario where, after we make adjustments similar to those mentioned above, a steam rate of $19.61/mlb. can be shown. Appendix A, Exhibit 2. This is the most likely situation that Downtown steam customers would face after 1990.

Q. MR. LEVESQUE, YOU HAVE COMMENTED ON THE STEAM RATES TO RETAIL CUSTOMERS. ARE THERE ANY IMPLICIT ASSUMPTIONS ABOUT THE NUMBER OF CUSTOMERS IN STAFF CONSULTANT DAHLEN'S ANALYSIS THAT AFFECT HIS SCENARIOS.

A. Yes, there are. Flying in the face of our experience and that of most other steam systems, Staff has assumed that all steam customers are

retained. That is a very grave, misleading, and, we think, erroneous assumption. The number of steam retail customers has been falling in recent years, even when steam prices were below $10/mlb. The number of customers can be expected to fall in the future as steam rates increase. This means that each of the remaining customers who stay on the system will be paying for an increasing percentage of the fixed plant costs. As we note in Mr. Graham's rebuttal testimony, it is our contention that no amount of marketing or "rate stabilization" would have resulted in 100% customer retention.

Q. MR. LEVESQUE, MOST OF YOUR COMMENTS HAVE BEEN ABOUT THE LONG TERM REHABILITATION PLAN THAT WAS PROPOSED BY MR. DAHLEN. DO YOU THINK THAT THE SHORT TERM PROGRAM PROPOSED IS A GOOD WAY OF LEADING INTO THE LONG TERM PROGRAM?

A. No, I don't. The short term rehabilitation program makes little sense in that it addresses only a few critical items. It seems to be an attempt to suggest what a prudent operator of the Downtown system would do first in effecting rehabilitation. Nonetheless, there are some clearly deficient items.

Q. WHY DO YOU SAY THAT, MR. LEVESQUE? WHAT ARE THEY?

A. For the following reasons:

Boilers:

The summer boiler as proposed appears to us to be inadequate to its task by at least a factor of two. Our very lowest monthly steam requirement has been 46,000 mlb. A more typical monthly load in 1986 was 55,000 mlb. The proposed (70,000 lb/hr) boiler can only generate 50,000 mlb. maximum (assuming 100% capacity

factor) for the month. With normal derating and losses a much larger boiler would be required.

More importantly, the short term "fix" of installing a summer boiler for efficiency reasons ignores the basic condition of GAS and the older remaining boilers. Replacing just one boiler does not address a myriad of other problems.

Distribution System:

The so called Short Term program ignores major portions of the distribution system. It recommends modifications to the high pressure system (now serving about 23 customers) and totally ignores the low pressure system (now serving about 100 customers)! In fact it appears that Mr. Dahlen or Mr. Miller assume that the low pressure system is to operate 15-20 years without any additional investment. Additional investment would indeed be required to maintain for another 20 years, boilers which are currently over 30 years old and a low pressure distribution system which dates back to the early 1900's. That is hardly short term. And that's why I say the Short Term Rehabilitation Program makes little sense.

Q. MR. LEVESQUE, DID YOU MAKE ADJUSTMNETS TO MR. DAHLEN'S SHORT TERM REHABILITATION SCENARIO?

A. Yes, and the results are contained in Appendix A, Exhibit 3. The only changes Mr. Dahlen apparently made to his long term rehabilitation pricing analysis to arrive at his short term analysis was to reduce capital investment and associated costs; he did not take into account the other differences between Mr. Miller's long term and short term

rehabilitation scenarios. For example, Mr. Dahlen did not increase distribution O&M expense from his long term analysis level, even though the present distribution system is retained in the short term rehabilitation scenario. Similarly, he did not increase production O&M, even though the existing boilers at GAS are retained and used in the short term rehabilitation scenario. These are significant oversights.

Q. MR. LEVESQUE, DID YOU INVESTIGATE THE TYPICAL INSTALLATION COSTS OF GAS VS. ELECTRIC BOILERS?

A. Yes, we did. First let me say that due to the particulars of specific locations, the term "typical" is misleading.

Q. WHY IS THAT, MR. LEVESQUE?

A. Well, we showed in our gas vs. electric boiler analysis, Appendix A, Exhibit 4 that the most significant variable factor by far when making cost comparisons of gas vs. electric boilers is the site and the particular installation problems. For example, Mr. Dahlen has generalized a 200 bhp gas boiler requiring installation costs of $124,000. He compared that with an electric boiler facility requiring installation costs of $340,000. That would be a complex electric boiler installation. It would be just as valid had Mr. Dahlen selected a relatively simple electric installation and compared it to a complex gas installation. For example, imagine, if you will, a building with no possibility of an outside gas flue vent except on the roof. Such an installation could be very expensive to achieve floor by floor. The Home Savings Building, which is 17 stories high, is a case in point. It is possible to vent a basement located gas boiler there, but we understood that it would be difficult. In fact, Energy

Masters consultants have roughly estimated that venting a gas boiler could result in total installation costs that exceed $250,000-300,000. The point is that while the cost of comparably sized gas and electric boilers is about the same, the cost of installation for these boilers can vary widely. That's why I say the term "typical installation" is misleading.

Q. ARE YOU SAYING THAT THE COST OF BOILERS--BE THEY ELECTRIC OR GAS--ARE ABOUT THE SAME.

A. Just the boilers, yes, depending on their size of course. But the installation costs can vary widely. That makes comparing installations difficult and misleading.

Q. WHAT ABOUT ENERGY COSTS--GAS OR ELECTRICITY?

A. The gas price used by Staff Consultant Dahlen needed major adjustment. I note that fuel costs on a btu of delivered heat basis can favor gas this year in some simple gas boiler installations. But all the projections that we see, even those from the KPL Gas Service Company, show gas costs increasing significantly in future years. Indeed, KPL Gas Service has recently announced its intention to seek a significant rate increase in Missouri. In contrast, electric costs, particularly electric heat rates, can be expected to remain relatively stable, and because of Commission order KCPL electric rates are quite predictable. Thus, today's apparently economical gas installation may not compare at all well from an operating fuel cost standpoint in later years. We think that the differential between gas and electric would likely widen over time. The current cost of gas in Downtown Kansas City coupled with DRI based forecasts modified to reflect current and future conditions tend to make gas fuel much less attractive.

Q. SO, MR. LEVESQUE, ARE YOU SAYING THAT IT'S A TOSS UP BETWEEN ALL INSTALLATIONS--GAS OR ELECTRIC?

A. No I'm not. There are some simple gas installations where flue vents are short that are so economic that gas driven boilers may be the answer. On the other hand there are some gas installations that are so uneconomic, if not impossible, that electric driven boilers are the only answer. But where installation costs are about the same, there a customer maybe wise to select electric since his operating costs are likely to be more attractive in the long run. But it's up to the customer to decide. And that's the basis of our Plan. Let the customer decide what's in his best interest.

Q. WHAT ABOUT YOUR SUBSIDIZED ON-SITE BOILERS? HOW DOES THAT AFFECT THE SITUATION?

A. As noted elsewhere we are willing to provide electric boilers at no initial cost to the customer. If the Commission so decides, KPL Gas Service could provide gas boilers, too, at no initial cost, assuming that it would want to. Should the Commission see the provision of any kind of boilers as not in keeping with the promotional practices rules, then the customer is still free to make his own unsubsidized choice--gas or electric. Our underlying contention is that the central steam system is uneconomic for all. But individual steam boiler installations are economic at the present time. It's only a matter of whether to go gas or electric.

Q. DID YOU MAKE ANY OTHER SPECIAL ANALYSES?

A. Yes. We developed a very special case for Mr. Graham using our models that details the price of steam if all the buildings in the KCPL steam

service territory were steam heated. That material is appended to Mr. Graham's rebuttal testimony.

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

AFFIDAVIT

STATE OF MISSOURI)
) ss.
COUNTY OF JACKSON)

Robert W. Levesque, being first duly sworn, on his oath states: that he has participated in the preparation of the foregoing written testimony, in question and answer form, consisting of 11 pages, to be presented to the Public Service Commission of the State of Missouri in Case No. HO-86-139; that the answers therein contained were given by him; that he has knowledge of the matters set forth in said answers; and that such answers are true to the best of his knowledge and belief.

Robert W. Levesque

Subscribed and sworn to before me this 2nd day of April, 1987.

Carol Giles
Notary Public

My Commission Expires:

CAROL GILES
Notary Public, State of Missouri
Commissioned in Platte County
My Commission Expires June 15, 1987

Review of the District Steam Heating System Scenarios As Modeled by Derick O. Dahlen MPSC Consultant

Mr. Dahlen created three district steam heating scenarios. Each of these scenarios has been reviewed and found to have discrepancies, inconsistencies, and omissions. A modified case for each scenario was developed in order to evaluate the scenarios as provided by Dahlen. More realistic steam prices have been determined after adjusting for the discrepancies, inconsistencies and omissions. Overall, KCPL feels that Dahlen's analysis is ultra-conservative and, after KCPL's adjustments, shows the level of operation attainable by an efficient operator facing no contingencies (i.e., an ideal case). Other areas that KCPL cites as being overly conservative, but which are not fully addressed in this analysis, include: salary levels for all O&M personnel, manpower levels or contract labor required in lieu of additional manpower, maintenance materials for both GAS and the distribution system, annual capital expenditures and customer decline.

Long Term Rehabilitated System Including Sales to National Starch (Exhibit 1)

Summary of Adjustments Made to the Model Developed by Dahlen

In Order of Their $/MLB Impact

Impact of Adjustments for Year 1987*	$/MLB
1. Increase of gas prices to a DRI based KCPL forecast	$3.08
2. Inclusion of current net KCPL investment	2.50
3. Increase of Distribution O&M labor	0.62
4. Inclusion of property taxes	0.60
5. Increase of electricity needed to power auxiliary equipment	0.43
6. Inclusion of station heat and higher level of losses	0.39
7. Reduction in chemical treatment rate to actual GAS charge	(0.33)
All of the above Adjustments	7.29
Dahlen's original estimate	9.97
Adjusted Steam Cost	$17.26

*Comparable adjustments can be made for subsequent years.

An explanation for each of the adjustments made in creating the revised Long Term Rehabilitated System scenario is as follows:

1) The natural gas price forecasts have been adjusted to reflect the most recent prices per a KCPL adjusted DRI based forecast dated March, 1987. These prices agree with KCPL's current cost adjusted to known changes in gas prices. KCPL's March 1987 estimate of $3.63 per mmbtu is contrasted to Dahlen's figure of $2.18. Included are sales taxes amounting to approximately 6.5% to 7% of sales which were

neglected.

Impact: $3.08/mlb.

2) The present KCPL investment in the distribution system and the GAS, amounting to $5,514,000, has been included to reflect the remaining value of these facilities in rendering steam service. Mr. Dahlen assumes there is no value in the current plant. However, KCPL believes there is a value to a potential purchaser in the equipment necessary to serve the current customer base. Further, a depreciation life of 20 years reflecting primarily the expected economic life of replacement packaged boilers and related equipment is used in contrast to an unrealistic 30-year life.

Impact: $2.50/mlb.

3) The Distribution System O&M labor costs were increased from Miller's $117,500/year to $400,950 reflecting a higher level of manpower as estimated by KCPL's Steam Department engineers. The Dahlen model, based on Mr. Miller's work, assumes only three distribution maintenance personnel. KCPL's experience with high pressure maintenance indicates that a minimum of ten maintenance personnel is required for maintaining customer service, even with replacement of the low pressure system by high pressure.

Impact: $0.62/mlb.

4) Property taxes amounting to $79,160 on current steam plant (three boilers and low pressure distribution abandoned) and property taxes of $193,950 on capital additions to the distribution system and to boilers are included. No property taxes were considered by Dahlen.

Impact: $0.60/mlb.

5) The energy costs of auxiliary operations have been adjusted to 6,027 MWH's based on KCPL's actual experience level of 10,853 mw hours and a local chemical company's actual experience of 3.41 kwhrs/mlb transferred. This is contrasted to Dahlen's estimate of 2,892 mw hours, noting that several energy consuming devices are not replaced in either the long or short range rehabilitation scenarios.

Impact: $0.43/mlb.

6) GAS station heat based on actual experience amounting to 15,000 mlbs. and additional system losses of 40,700 mlb. (that Mr. Miller incorrectly removed as part of the allocated low pressure system losses) have been included.

Impact: $0.39/mlb.

7) Chemical treatment rates have been reduced from $.19/mlb. to $.04/mlb. reflecting KCPL's favorable experience.

Impact ($0.33)/mlb.

Long Term Rehabilitated System With No Sales to National Starch (Exhibit 2)

Summary of Adjustments Made to the Model Developed by Dahlen

In Order of Their $/MLB Impact

Impact of Adjustments for Year 1987*	$/MLB
1. Increase of gas prices to a DRI based KCPL forecast	$2.85
2. Inclusion of current net KCPL investment	2.50
3. Increase of Distribution O&M labor	0.62
4. Inclusion of property taxes	0.60
5. Increase of electricity needed to power auxiliary equipment	0.39
6. Inclusion of station heat and higher level of losses	0.39
7. Reduction in chemical treatment rate to actual GAS charge	(0.18)
All of the above Adjustments	7.17
Dahlen's original estimate	12.44
Adjusted steam cost	$19.61

*Comparable adjustments can be made for subsequent years.

An explanation for each of the adjustments made in creating the revised Long Term Rehabilitated System (less National Starch) scenario is as follows:

1) The natural gas price forecasts have been adjusted to reflect the most recent prices per a KCPL adjusted DRI based forecast dated March, 1987. These prices agree with KCPL's current cost adjusted to known changes in gas prices. The 1987 estimate of $3.63 per mmbtu

is contrasted to Dahlen's $2.18. Also included are sales taxes amounting to approximately 6.5 to 7% of sales which were neglected.

Impact: $2.85/mlb.

2) The present KCPL investment in the distribution system and the GAS, amounting to $5,514,000 has been included to reflect the remaining value of these facilities in rendering steam service Mr. Dahlen assumes there is no value in the current plant. However, KCPL believes there is a value to a prospective purchaser in the equipment necessary to serve the current customer base. Further, a depreciation life of 20 years reflecting primarily the expected economic life of replacement packaged boilers and related equipment is used in contrast to an unrealistic 30-year life.

Impact: $2.50/mlb.

3) The Distribution System O&M labor costs were increased from Miller's $117,500/year to $400,950 reflecting a higher level of manpower as estimated by KCPL's Steam Department engineers. The Dahlen model, based on Miller's work, assumes only three distribution maintenance personnel. KCPL's experience with high pressure maintenance requires a minimum of 10 maintenance personnel for maintaining customer service even with replacement of the low pressure system by high pressure. Again, our Distribution System manpower analysis was shared with consultants.

Impact: $0.62/mlb.

4) Property taxes amounting to $79,160 on current steam plant (Three boilers and low pressure distribution abandoned) and property taxes of $193,950 on capital additions (Distribution and Boilers) are included. No property taxes were considered by Dahlen.

Impact: $0.60/mlb.

5) The energy costs of auxiliary operations have been adjusted to 4,443 mw hours based on KCPL's actual experience level of 10,853 mw hours and a local chemical company's actual experience of 3.41 kwhrs/mlb transferred. This is contrasted to Dahlen's estimate of 1,624 mw hours noting that several energy consuming devices are not replaced in either the long or short term rehabilitation scenarios.

Impact: $0.39/mlb.

6) GAS station heat based on actual experience amounting to 15,000 mlbs. and additional system losses of 40,700 mlb. (that Mr. Miller incorrectly removed as part of the allocated low pressure system losses) have been included.

Impact: $0.39/mlb.

7) Chemical treatment rates have been reduced from $.19/mlb. to $.04/mlb. reflecting KCPL's favorable experience.

Impact: ($0.18)/mlb.

Short Term Rehabilitated System Including Sales to National Starch (Exhibit 3)

Summary of Adjustments Made to the Model Developed by Dahlen

In Order of Their $/MLB Impact

Impact of Adjustments in 1987*	$/MLB
1. Increased gas prices to a DRI based KCPL forecast	$3.27
2. Increase of GAS O&M	2.89
3. Increase of distribution O&M to Staff's level	2.58
4. Inclusion of current net KCPL investment	2.26
5. Increase of electricity for auxiliaries	1.09
6. Inclusion of station heat and higher level of losses	0.67
7. Inclusion of property taxes	0.39
8. Reduction in chemical treatment rate to actual GAS charge	(0.33)
All of the above Adjustments	12.82
Dahlen's original estimate	6.51
Adjusted Steam cost	19.33

*Comparable adjustments can be made for subsequent years.

An explanation for each of the adjustments made in creating the revised Short Term Rehabilitated System scenario is as follows:

1) The natural gas price forecasts have been adjusted to reflect the most recent prices per a KCPL adjusted DRI based forecast dated March, 1987. These prices agree with KCPL's current cost adjusted to known changes in gas price. The 1987 estimate of $3.63 per mmbtu

is contrasted to Dahlen's $2.18. Also included are sales taxes amounting to approximately 6.5 to 7% of sales which were neglected.

Impact: $3.27/mlb.

2) The GAS O&M Labor Costs were increased from Dahlen's $693,000/year to $1,510,380 to reflect the operating costs of continued use of current GAS boilers (for winter operations). This figure assumes a manpower level of 34 at Grand Avenue as a minimum required to operate and maintain the current equipment with all gas fuel. Materials of $162,400 have been increased to $670,700 to reflect KCPL's actual 1986 experience of $1,179,000 modified (reduced) to reflect the transition to gas fired.

Impact: $2.89/mlb.

3) The Distribution System O&M costs were increased from Dahlen's $257,400/year to $1,436,729 reflecting the maintenance manpower and materials levels as recommended by Staff in Staff Accounting Schedule 12. The Dahlen model, based on Miller's work, assumes only three distribution system maintenance personnel. Staff recommendation agrees with the KCPL 1987 authorized manpower level of fifteen maintenance personnel. KCPL's experience with high pressure maintenance requires the stated levels of manpower for maintaining customer service even with replacement of the low pressure system by high pressure.

Impact: $2.58/mlb.

4) The present KCPL investment in the distribution system and the GAS amounting to $5,514,000, has been included to reflect the remaining value of these facilities in rendering steam service. Mr. Dahlen assumes there is no remaining value in the current plant. However, KCPL believes there is a value to a prospective purchaser in the equipment necessary to serve the current customer base. Included are capital additions amounting to $134,000 annually as noted in the Downtown Steam System Conversion Study. Also included are major retubing maintenance for two of the four existing boilers amounting to approximately $300,000 each. Two boilers were retubed in 1984. Further, a depreciation life of 20 years reflecting primarily the expected economic life of replacement packaged boilers and related equipment in contrast to an unrealistic 30-year life per Dahlen is included.

Impact: $2.26/mlb.

5) The energy cost of auxiliary operations have been adjusted to KCPL's actual experience level of 10,853 mw hours in contrast to Dahlen's estimate of 2,892 mw hours noting that several energy consuming devices are not replaced in either the long or short term rehabilitation scenarios.

Impact: $1.09/mlb.

6) GAS station heat based on actual experience amounting to 15,000 mlbs. and additional system losses of 79,674 (to reflect 1985 actual loss levels) have been included.

Impact: $0.67/mlb.

7) Property taxes amounting to $133,933 on current steam plant (GAS and Distribution System) and property taxes of $44,365 on capital additions (Distribution and Boilers) are included.

Impact $0.39/mlb.

8) Chemical treatment rates have been reduced from $.19/mlb. to $.04/mlb. reflecting KCPL's favorable experience.

Impact: $(0.33)/mlb.

Evaluation of Dahlen's Testimony
On Individual Electric and Gas Boilers

In addition, to the district steam heating scenarios, Dahlen developed several scenarios comparing individual boilers fueled by gas or boilers powered by electricity. Since Dahlen chose 200 Bhp for the size of his gas boiler and developed only one scenario using gas, this size was used for reviewing and comparing electric and gas individual boilers. The review revealed some deficiencies in Dahlen's analysis. Primarily, his installed costs were not on a consistent basis and the gas price was not what a gas customer in downtown Kansas City could be expected to pay. A comparative analysis has been prepared using KCPL's actual installation data for the Home Savings building at 1006 Grand. Energy Masters Corporation (who installed the electric boilers at Home Savings) provided preliminary estimates for the installation of gas boilers at the Home Savings site. The results of this comparison are shown in Exhibit 4.

Exhibit 1

			1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
[illegible]																	
[illegible]		488,639 MLB	7,918,091	7,997,864	7,947,218	8,047,771	8,221,942	8,537,271	8,924,229	9,335,553	9,948,338	10,621,808	11,444,381	12,441,582	13,742,314	15,225,694	17,139,836
[illegible]		485,634 MLB	3,565,915	3,799,838	3,709,838	3,825,279	3,999,653	4,275,745	4,689,961	5,082,382	5,499,095	6,819,462	6,673,384	7,472,597	8,533,378	9,819,376	11,337,880
[illegible]		884,273 MLB	11,583,607	11,786,894	11,656,248	11,873,051	12,221,595	12,813,016	13,534,190	14,337,855	15,437,483	16,648,498	18,117,765	19,914,398	22,275,684	25,134,871	28,477,717
[illegible]																	
[illegible]	1/	1,539,860 MMBTU	5,599,692	5,851,468	5,851,468	6,097,846	6,467,412	7,052,559	7,768,894	8,592,419	9,624,125	10,748,223	12,134,897	13,837,943	15,876,138	18,581,189	22,219,998
[illegible]	2/	6,887 MW	379,219	394,788	406,839	420,282	428,648	458,896	465,827	487,987	438,669	454,858	488,593	587,775	536,222	582,396	597,897
[illegible]	3/		1,094,830	1,132,871	1,171,825	1,218,441	1,272,436	1,333,811	1,401,539	1,476,273	1,558,768	1,646,292	1,739,429	1,837,784	1,948,650	2,068,269	2,161,825
[illegible]		174,988 $	174,988	180,568	186,777	194,287	202,813	212,596	223,391	235,383	248,451	262,482	277,247	292,911	309,328	326,468	344,445
[illegible]	4/	40,825 $	40,825	41,415	42,039	44,543	46,517	48,761	51,237	53,969	56,944	60,184	63,589	67,182	70,945	74,883	79,002
[illegible]																	
[illegible]			162,400	175,984	181,952	189,198	197,574	207,184	217,628	229,224	242,232	255,624	270,385	285,345	301,329	318,256	335,947
[illegible]			135,900	144,756	149,736	155,592	162,592	170,434	179,009	188,636	199,178	210,363	222,264	234,822	247,976	261,748	276,125
[illegible]		231,000 $	231,000	239,892	247,241	257,875	268,469	281,418	295,788	311,476	328,879	347,348	366,998	387,733	409,453	432,179	455,949
[illegible]		92,000 $	92,000	95,195	98,468	102,305	106,923	112,068	117,771	124,051	130,982	138,338	146,164	154,422	163,072	172,123	181,598
[illegible]		176,000 $	176,000	182,112	188,374	195,868	204,547	214,414	225,381	237,315	250,575	264,646	279,618	295,416	311,985	329,279	347,398
[illegible]	5/		273,110	231,787	209,652	198,297	178,982	151,587	132,112	132,112	132,112	132,112	132,112	132,112	132,112	132,112	132,112
[illegible]			8,352,794	8,669,724	8,734,412	9,065,748	9,528,825	10,234,788	11,078,488	11,988,686	13,282,768	14,528,389	16,112,196	18,023,364	20,499,183	23,462,982	26,938,263
[illegible]	6/		917,500	917,500	917,500	917,500	917,500	917,586	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,582
[illegible]			9,270,294	9,587,224	9,651,912	9,983,248	10,446,325	11,152,288	11,987,988	12,906,186	14,128,268	15,437,889	17,029,696	18,948,864	21,416,683	24,388,482	27,847,783
[illegible]	7/		1,886,473	1,799,218	1,781,963	1,684,766	1,587,453	1,418,198	1,312,943	1,215,688	1,118,433	1,021,178	923,923	826,668	729,413	632,158	534,903
[illegible]			336,931	319,652	302,374	285,095	267,817	250,538	233,260	215,981	198,783	181,424	164,146	146,867	129,589	112,310	95,032
[illegible]			11,583,607	11,786,894	11,656,248	11,873,051	12,221,595	12,813,016	13,534,190	14,337,855	15,437,483	16,648,498	18,117,755	19,914,398	22,275,684	25,134,871	28,477,717
[illegible]																	
[illegible]		17.26	17.44	17.33	17.55	17.93	18.61	19.44	20.35	21.69	23.15	24.95	27.13	29.95	33.37	37.37
[illegible]		11.11%	1.92	1.94	1.93	1.95	1.99	2.07	2.16	2.26	2.41	2.57	2.77	3.01	3.23	3.71	4.15
[illegible]			19.18	19.37	19.25	19.50	19.92	20.68	21.62	22.62	24.10	25.73	27.73	30.14	33.29	37.28	41.52

Exhibit 1

Exhibit 1 cont'd

			1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
[illegible]			1.1729	1.2127	1.2544	1.3043	1.3621	1.4278	1.5003	1.5803	1.6686	1.7623	1.8629	1.9672	2.0774	2.1927	2.3133
[illegible]			1.0000	1.0347	1.0703	1.1129	1.1622	1.2183	1.2801	1.3484	1.4237	1.5037	1.5887	1.6785	1.7725	1.8709	1.9738
[illegible]				3.473%	3.439%	3.976%	4.431%	4.823%	5.078%	5.332%	5.586%	5.615%	5.657%	5.628%	5.628%	5.928%	5.928%
[illegible]			3.63	3.8	3.8	3.96	4.2	4.58	5.04	5.58	6.25	6.98	7.88	8.98	10.44	12.2:	14.3
[illegible]				104.683%	100.000%	104.211%	106.061%	109.048%	110.044%	110.714%	112.097%	111.628%	112.894%	113.959%	116.258%	116.994%	117.117%
[illegible]			62.92	65.49	67.37	69.72	71.12	74.68	77.29	67.68	71.46	75.47	79.74	84.25	88.97	93.9:	99.07
[illegible]			4.634	4.924	4.924	5.197	5.607	6.256	7.041	7.963	9.105	10.352	11.889	13.756	16.259	19.259	22.846
[illegible]		1.79	3.790	3.750	3.790	3.790	3.790	3.790	3.790	3.790	3.790	3.750	3.790	3.750	3.790	3.790	3.750
[illegible]			8.424	8.714	8.714	8.987	9.397	10.046	10.831	11.753	12.896	14.142	15.679	17.556	20.049	23.079	26.638
[illegible]	18,250,000	20	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500
[illegible]	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]			917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500
[illegible]			79,168	76,543	73,927	73,927	73,927	73,927	73,927	73,927	73,927	73,927	73,927	73,927	73,927	73,927	73,927
[illegible]	12,836,000		12,836,000	12,836,000	12,836,000	12,836,000	12,836,000	12,836,000	12,836,000	12,836,000	12,836,000	12,836,000	12,836,000	12,836,000	12,836,000	12,836,000	12,836,000
[illegible]			193,950	155,160	135,765	116,370	96,975	77,580	58,185	58,185	58,185	58,185	58,185	58,185	58,185	58,185	58,185
[illegible]			273,118	231,703	209,692	190,297	170,902	151,507	132,112	132,112	132,112	132,112	132,112	132,112	132,112	132,112	132,112
[illegible]			18,250,000	17,432,500	16,515,000	15,597,500	14,680,000	13,762,500	12,845,000	11,927,500	11,010,000	10,092,500	9,175,000	8,257,500	7,340,000	6,422,500	5,505,000
[illegible]			17,432,500	16,515,000	15,597,500	14,680,000	13,762,500	12,845,000	11,927,500	11,010,000	10,092,500	9,175,000	8,257,500	7,340,000	6,422,500	5,505,000	4,587,500
[illegible]			17,091,250	16,973,750	16,056,250	15,138,750	14,221,250	13,303,750	12,386,250	11,468,750	10,551,250	9,633,750	8,716,250	7,798,750	6,881,250	5,963,750	5,046,250
[illegible]	10.6%		1,896,473	1,799,218	1,701,963	1,604,708	1,507,453	1,410,198	1,312,943	1,215,688	1,118,433	1,021,178	923,923	825,668	729,413	632,158	534,903
[illegible]	34.0%		336,931	319,652	302,374	285,095	267,817	250,538	233,260	215,981	198,703	181,424	164,146	146,867	129,589	112,310	95,032

[illegible]

a/ Plant expense includes cost for an additional 15,000 M.Bs for space heating the SHS. Also includes an increase in losses from 84,600 (69.9%) to 107,200 (81.7%) M.Bs. Miller understates losses by allocating the current level of losses to low and high pressure systems based on calculated radiation losses for each system. (See Separate Analysis). Thus, Miller has understated losses for a harsh and system such as Kansas City's. Gas prices shown here reflect KCPL's March, 1987, DRI based forecast.

b/ Electricity rate is based on Hoisy's experience and actual SHS use for 12 months ended February, 1987.

c/ Distribution O&M Labor is increased due to increasing the manpower required for proper operation and maintenance. KCPL feels, based on operating experience, that a manpower level of at least ten would be required to support the steam distribution system. This is conflict with Mr. Miller's estimate of three.

d/ Chemical treatment costs at SHS are approximately 0.04/mlb. rather than 0.19 used by Danlem.

e/ Property taxes on current plant and the proposed additions were neglected by Danlem. Property taxes are assessed on 33% of the depreciated asset (by depreciation ratio) at a rate of 4.533%.

f/ Reflects a depreciation on KCPL's current net plant and new boiler additions at 28 year life for both.

g/ Reflects a return of 10.6% on KCPL's current net plant (93.5 million).

Impact of Adjustments in 1987 ($/M.B)

Increased gas prices to a DRI based KCPL forecast	3.38
Inclusion of current net KCPL investment	2.52
Increase of distribution O&M labor	0.62
Inclusion of property taxes	0.58
Increase of electricity for auxiliaries	0.42
Inclusion of station heat and higher level of losses	0.25
Reduction in chemical treatment rate to actual SHS charge	(0.33)
	7.29
Danlem's estimate	9.57
	(7.26)

Exhibit 1 cont'd

Exhibit 2

[redacted]

[redacted] CITY POWER & LIGHT CO.
[redacted] STATES STEAM SYSTEM EXCLUDING NATIONAL STARCH - LONG TER[illegible]

[redacted] STEAM RATE CASE REBUTTAL TESTIMONY

			1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	200[illegible]
SALES:																	
[redacted]		458,639 M LB	8,992,312	9,078,926	9,022,756	9,129,679	9,318,139	9,656,837	10,073,572	10,541,275	11,199,988	11,923,135	12,811,829	13,889,750	15,382,516	17,284,166	19,285,[illegible]
[redacted]		0 M LB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL		458,639 M LB	8,992,312	9,078,926	9,022,756	9,129,679	9,318,139	9,656,837	10,073,572	10,541,275	11,199,988	11,923,135	12,811,829	13,889,750	15,382,516	17,284,166	19,285,[illegible]
EXPENSES:																	
FUEL	1/	981,699 MBTU	3,272,115	3,425,354	3,425,354	3,569,598	3,785,918	4,128,453	4,543,10[illegible]	5,029,862	5,631,886	6,291,835	7,143,103	8,094,553	9,418,718	11,286,184	12,898,[illegible]
ELECTRICITY	2/	4,443 MWH	279,554	290,972	299,325	309,756	315,966	331,883	343,399	380,782	317,497	335,313	354,225	374,323	395,254	417,542	440,[illegible]
O & M [redacted]	3/		1,094,858	1,132,871	1,171,826	1,210,441	1,272,436	1,333,811	1,401,539	1,476,273	1,558,768	1,646,292	1,739,429	1,837,784	1,940,858	2,048,[illegible]	2,161,[illegible]
[redacted]		98,883 $	98,883	101,406	104,893	109,066	113,859	119,393	125,456	132,145	139,529	147,364	155,781	164,498	173,713	183,754	193,[illegible]
[redacted]	4/	22,476 $	22,476	23,259	24,058	25,815	26,124	27,364	28,775	30,389	32,042	33,799	35,712	37,729	39,863	42,054	44,[illegible]
MAINTENANCE																	
[redacted]			162,480	175,584	181,952	189,198	197,574	207,104	217,529	229,224	242,832	255,624	270,865	285,345	301,329	318,954	335,[illegible]
[redacted]			139,980	144,758	149,736	155,692	162,552	170,434	179,889	188,638	199,178	210,353	222,264	234,822	247,976	261,748	276,[illegible]
O & M [redacted]		231,886 $	231,886	239,822	247,241	257,976	268,469	281,418	295,788	311,476	328,879	347,346	366,998	387,732	409,453	432,179	422,[illegible]
O & M [redacted]		92,869 $	92,869	95,195	96,468	102,385	106,923	112,068	117,771	124,851	130,982	138,338	146,154	154,422	163,072	172,122	181,[illegible]
[redacted]		176,888 $	176,888	182,112	188,374	195,868	204,547	214,414	225,381	237,315	250,575	264,646	279,618	295,416	311,965	329,279	347,[illegible]
PROPERTY TAX	5/		273,118	251,783	289,692	190,297	179,982	151,587	132,112	132,112	132,112	132,112	132,112	132,112	132,112	132,112	132,[illegible]
TOTAL O&M, D&A			5,841,409	6,042,356	6,189,928	6,322,377	6,625,378	7,077,882	7,689,878	8,192,186	8,965,353	9,881,832	10,885,471	11,998,756	13,526,117	15,342,788	17,077,867
DEPRECIATION	6/		917,588	917,588	917,588	917,588	917,588	917,588	917,588	917,588	917,588	917,588	917,588	917,588	917,588	917,588	917,588
TOTAL O&M AND DEPRECIATION			6,758,989	6,960,856	7,018,428	7,239,877	7,542,878	7,995,382	8,527,378	9,109,686	9,882,853	10,728,533	11,722,971	12,916,256	14,443,617	16,260,288	17,995,367
[redacted]	7/		1,896,473	1,799,218	1,731,963	1,684,788	1,587,453	1,418,198	1,312,943	1,215,688	1,118,433	1,021,178	923,923	826,668	729,413	632,158	534,903
INCOME TAXES			336,931	319,652	302,374	285,095	267,817	258,538	233,258	215,981	198,703	181,424	164,146	146,867	129,589	112,310	95,032
REVENUE REQUIREMENT			8,992,312	9,078,926	9,022,756	9,129,679	9,318,139	9,656,837	10,073,572	10,541,275	11,199,988	11,923,135	12,811,839	13,889,750	15,382,518	17,284,166	19,285,[illegible]
[redacted]			19.61	19.80	19.67	19.91	20.32	21.05	21.96	22.98	24.42	25.99	27.93	30.28	33.37	37.32	41.44
[redacted]		11.11%	2.18	2.20	2.19	2.21	2.26	2.34	2.44	2.55	2.71	2.89	3.10	3.36	3.71	4.12	4.62
STEAM COST			21.78	21.99	21.86	22.12	22.57	23.39	24.40	25.54	27.13	28.89	31.04	33.65	37.27	41.28	46.06

Exhibit 2

Exhibit 2 cont'd

			1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GNP DEFLATOR (1982=1)			1.1720	1.2127	1.2544	1.3043	1.3621	1.4278	1.5003	1.5803	1.6686	1.7623	1.8620	1.9672	2.0774	2.1927	2.3133
YEAR BASE			1.0000	1.0347	1.0703	1.1129	1.1622	1.2183	1.2801	1.3484	1.4237	1.5037	1.5887	1.6785	1.7725	1.8709	1.9738
ANNUAL INFLATION				3.473%	3.439%	3.978%	4.431%	4.823%	5.078%	5.332%	5.568%	5.615%	5.657%	5.678%	5.682%	5.703%	5.726%
FUEL COST/UNIT			3.63	3.8	3.8	3.96	4.2	4.58	5.04	5.58	6.25	6.98	7.68	8.98	10.44	12.2	14.3
PERCENT OF LAST YEAR				104.683%	100.000%	104.211%	106.061%	109.048%	110.044%	110.714%	112.007%	111.680%	110.029%	113.958%	116.258%	116.954%	117.117%
ELECTRIC COST			62.92	65.49	67.37	69.72	71.12	74.68	77.29	67.68	71.46	75.47	79.74	84.25	88.97	93.9	99.27
% STEAM FUEL COST			4.634	4.924	4.924	5.197	5.687	6.256	7.041	7.963	9.106	10.352	11.809	13.756	16.259	19.259	22.849
% STEAM OF GEN		3.79	3.790	3.790	3.790	3.790	3.790	3.790	3.790	3.790	3.790	3.790	3.790	3.790	3.790	3.790	3.790
HISTORIC STEAM PRICE			8.484	8.714	8.714	8.987	9.397	10.046	10.631	11.753	12.895	14.142	15.575	17.255	20.249	23.879	28.535
INITIAL PLANT DEPRECIATION	10,200,000	20	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500
PLANT ADDITIONS	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLANT DEPRECIATION			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL DEPRECIATION			917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500	917,500
CURRENT INVESTMENT, PROP. TAX			79,160	76,543	73,927	73,927	73,927	73,927	73,927	73,927	73,927	73,927	73,927	73,927	73,927	73,927	73,927
TOTAL NEW INVESTMENT	12,835,000		12,835,000	12,835,000	12,835,000	12,835,000	12,835,000	12,835,000	12,835,000	12,835,000	12,835,000	12,835,000	12,835,000	12,835,000	12,835,000	12,835,000	12,835,000
NEW INVESTMENT, PROP. TAX			193,950	185,160	135,765	116,370	96,975	77,580	58,185	58,185	58,185	58,185	58,185	58,185	58,185	58,185	58,185
TOTAL PROPERTY TAX			273,110	261,703	209,692	190,297	170,902	151,507	132,112	132,112	132,112	132,112	132,112	132,112	132,112	132,112	132,112
GAFO BASE GFD			18,350,000	17,432,500	16,515,000	15,597,500	14,680,000	13,762,500	12,845,000	11,927,500	11,010,000	10,092,500	9,175,000	8,257,500	7,340,000	6,422,500	5,505,000
GAFO BASE GFD			17,432,500	16,515,000	15,597,500	14,680,000	13,762,500	12,845,000	11,927,500	11,010,000	10,092,500	9,175,000	8,257,500	7,340,000	6,422,500	5,505,000	4,587,500
GAFO BASE PURCHASE			17,091,250	16,173,750	15,256,250	14,338,750	13,421,250	12,503,750	11,586,250	10,668,750	9,751,250	8,833,750	7,916,250	6,998,750	6,081,250	5,163,750	4,246,250
AVOIDED RETAIL	10,600		1,055,473	1,799,318	1,701,963	1,604,780	1,507,433	1,410,198	1,312,943	1,215,588	1,118,433	1,021,178	923,923	825,668	727,413	632,158	534,903
INCOME TAXES	34.00%		326,931	345,852	302,374	285,995	267,817	250,528	233,260	215,961	198,783	181,424	164,145	146,867	129,589	112,310	95,032

NOTES

1/ Fuel expense includes cost for an additional 15,000 MBtu for space heating the GAS. Also includes an increase in losses from 86,400 (15.0%) to 127,300 (21.7%) MBtu. Miller understates losses by allocating the current level of losses to low and high pressure systems based on calculated radiation losses for each system. (See Separate Analysis). Thus, Miller has understated losses for a system out system such as Kansas City's. Gas prices shown here reflect KCPL's March, 1987, DRI based forecast.

2/ Electricity Rate is based on Mahay's experience and actual GAS use for 12 months ended February, 1987.

3/ Distribution GAS Labor is increased due to increasing the manpower required for proper operation and maintenance. KCPL feels, based on operating experience, that a manpower level of at least ten would be required to support the steam distribution system. This is conflict with Mr. Miller's estimate of three.

4/ Chemical Treatment costs at GAS are approximately 0.04/mlb. rather than 0.19 used by Donlon.

5/ Property taxes on current plant and the proposed additions were neglected by Donlon. Property taxes are assessed on 33% of the depreciated asset (by depreciation ratio) at a rate of 4.533%.

6/ Reflects a depreciation on KCPL's current net plant and new boiler additions at 20 year life for both.

7/ Reflects a return of 10.6% on KCPL's current net plant (65.5 million).

Impact of Adjustments in 1987 ($/MLB)

Increased gas prices to a DRI based KCPL forecast	2.25
Inclusion of current net KCPL investment	2.59
Increase of distribution GAS labor	0.62
Inclusion of property taxes	0.69
Increase of electricity for auxiliaries	0.25
Inclusion of station heat are higher level of losses	0.79
Reduction in chemical treatment rate to actual GAS charge	(0.19)
	7.17
Donlon's estimate	12.44
	(5.27)

Exhibit 2 cont'd

Exhibit 3

[redacted]

[redacted] CITY POWER & LIGHT CO.
[redacted] SYSTEM INCLUDING NATIONAL STARCH - SHORT TERM

[redacted] STEAM RATE CASE REBUTTAL TESTIMONY

			1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
SALES:																	
[redacted]		458,639 MLB	8,065,635	9,160,854	9,384,826	9,628,833	10,068,867	10,665,894	11,327,682	11,956,398	12,977,658	13,874,361	15,045,818	16,414,255	18,112,968	20,115,787	22,414,868
[redacted]		425,634 MLB	3,585,515	3,799,038	3,799,038	3,825,279	3,999,653	4,275,742	4,649,961	5,882,382	5,469,895	6,819,482	6,673,284	7,472,597	8,323,378	9,239,375	11,229,686
[redacted]		884,273 MLB	12,451,151	12,877,884	13,813,856	13,445,312	14,867,728	14,941,636	15,937,643	16,958,780	18,366,753	19,893,843	21,718,353	23,886,86[illegible]	26,852,338	29,355,376	33,782,765
EXPENSES:																	
FUEL	1/	1,998,471 MMBTU	5,882,450	6,874,198	6,974,198	6,329,945	6,713,578	7,320,997	8,856,294	8,919,458	9,959,444	11,157,328	12,595,351	14,334,278	15,888,237	18,817,33[illegible]	22,458,[illegible]
[redacted]	2/	10,803 MW	682,871	719,763	731,167	756,671	771,865	810,582	838,858	734,531	775,595	819,876	867,418	914,365	962,55[illegible]	1,013,28[illegible]	1,072,227
O & M LABOR - 86%	3/		1,510,380	1,562,831	1,616,571	1,680,878	1,755,366	1,840,835	1,933,457	2,036,554	2,150,358	2,271,111	2,399,597	2,535,[illegible]78	2,677,[illegible]87	2,825,777	2,98[illegible]96
[redacted]		174,580 $	174,580	180,568	186,777	194,207	202,813	212,556	223,391	235,383	248,451	262,402	277,247	292,9[illegible]	309,327	326,486	344,447
[redacted]	4/	48,825 $	48,825	41,415	42,839	44,543	46,517	48,761	51,237	53,969	56,984	60,184	63,589	67,[illegible]82	70,945	74,883	79,022
[redacted]	5/		670,700	693,991	717,855	746,411	779,486	817,867	858,576	904,358	954,889	1,008,511	1,065,566	1,125,769	1,[illegible]86,833	1,254,816	1,[illegible]23,[illegible]
[redacted]	5/		1,436,789	1,486,622	1,537,741	1,590,913	1,669,763	1,750,389	1,839,155	1,937,255	2,045,580	2,160,365	2,282,535	2,411,547	2,546,639	2,567,382	2,828,464
O & M LABOR		231,000 $	231,000	239,062	247,241	257,076	268,469	281,416	295,788	311,476	326,879	347,348	366,958	387,733	409,453	432,[illegible]73	455,[illegible]96
O & M MAINT'N & MISC.		92,000 $	92,000	90,195	98,468	102,385	106,923	112,088	117,771	124,051	130,982	138,338	146,[illegible]54	154,422	163,272	172,[illegible]23	181,[illegible]90
[redacted]		176,000 $	176,000	182,112	188,374	195,868	204,547	214,414	225,381	237,315	250,575	264,646	279,618	295,416	311,965	329,275	347,352
PROPERTY TAX	6/		188,910	158,375	160,191	157,103	159,158	154,743	150,731	146,552	149,826	149,956	150,[illegible]72	151,374	152,646	153,999	155,447
[redacted]			10,997,572	11,435,864	11,681,414	12,054,881	12,678,485	13,562,941	14,598,466	15,642,841	17,081,644	18,638,874	20,492,386	22,693,[illegible]59	25,483,689	28,794,853	32,637,[illegible]75
[redacted]	6/		431,159	438,883	445,254	452,718	477,920	466,352	494,669	583,783	513,242	523,317	533,961	545,287	557,883	569,518	582,842
[redacted]			11,428,722	11,873,157	12,946,667	12,516,711	13,156,415	14,049,833	15,085,157	16,146,544	17,594,886	19,152,198	21,026,867	23,235,365	26,040,772	29,353,[illegible]71	33,220,[illegible]18
[redacted]	7/		868,[illegible]35	802,460	820,599	788,512	773,825	758,[illegible]17	723,888	689,634	655,423	621,[illegible]76	587,283	553,[illegible]11	519,[illegible]98	485,[illegible]99	451,[illegible]84
INCOME TAXES			154,243	151,451	145,789	149,888	137,479	134,658	128,686	122,[illegible]12	116,444	110,377	104,323	98,284	92,[illegible]53	86,247	80,247
[redacted]			12,451,151	12,877,884	13,813,856	13,445,312	14,867,728	14,941,636	15,937,643	16,958,728	18,366,753	19,893,843	21,718,393	23,886,86[illegible]	26,852,338	29,[illegible]25,[illegible]76	33,782,743
[redacted]			19.33	19.99	20.29	20.96	21.95	23.26	24.78	26.37	28.28	30.25	32.64	35.79	39.[illegible]5	43.86	48.67
[redacted]		11.11%	2.15	2.22	2.25	2.33	2.44	2.58	2.74	2.90	3.12	3.36	3.64	3.98	4.39	4.87	5.42
[redacted]			21.48	22.21	22.54	23.31	24.39	25.84	27.44	28.97	31.28	33.61	36.45	39.77	43.98	48.73	54.[illegible]

Exhibit 3

Exhibit 3 cont'd

			1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
[illegible]			1.1720	1.2127	1.2544	1.3043	1.3621	1.4278	1.5003	1.5803	1.6686	1.7623	1.8628	1.9672	2.0774	2.1927	2.3133
[illegible]			1.0000	1.0347	1.0703	1.1129	1.1622	1.2183	1.2801	1.3484	1.4237	1.5037	1.5887	1.6785	1.7725	1.8709	1.9738
[illegible]				3.473%	3.439%	3.978%	4.431%	4.823%	5.178%	5.332%	5.509%	5.515%	5.657%	5.628%	5.682%	5.722%	5.598%
[illegible]			3.63	3.8	3.8	3.96	4.2	4.58	5.26	5.58	6.25	6.58	7.68	8.58	10.44	12.2[illegible]	14.3
[illegible]				104.683%	100.000%	104.211%	106.061%	109.048%	110.044%	118.714%	112.387%	111.668%	112.854%	111.959%	115.258%	116.[illegible]%	117.[illegible]%
[illegible]			62.92	65.49	67.37	69.72	71.12	74.68	77.29	67.58	71.46	75.47	79.74	84.25	88.97	93.9[illegible]	99.27
[illegible]			4.634	4.924	4.924	5.197	5.687	6.256	7.841	7.963	9.[illegible]6	10.352	11.889	13.766	15.259	19.259	18.548
[illegible]		3.79	3.750	3.750	3.750	3.750	3.750	3.750	3.750	3.750	3.750	3.750	3.750	3.750	3.750	3.752	3.750
[illegible]			8.424	8.714	8.714	8.987	9.397	10.046	10.831	11.753	12.866	14.142	15.679	17.[illegible]55	20.849	23.873	25.[illegible]38
[illegible]	8,185,000	20	409,450	409,450	409,450	409,450	409,450	409,450	409,450	409,450	409,450	409,450	409,450	409,450	409,450	409,450	409,450
[illegible]	134,000		434,000	138,653	143,421	149,125	504,395	163,247	171,536	180,683	190,778	201,492	212,891	224,919	237,318	250.78[illegible]	264.[illegible]90
[illegible]			21,700	28,633	35,804	43,260	68,480	76,642	85,219	94,253	103,792	113,867	124,511	135,727	147,633	160.[illegible]66	173.[illegible]96
[illegible]			431,150	438,083	445,254	452,710	477,930	486,892	494,669	503,733	513,242	523,317	533,961	545,287	557,883	569.[illegible]18	581.[illegible]43
[illegible]			133,933	128,699	123,464	123,464	123,464	123,464	123,464	123,464	123,464	123,464	123,464	123,464	123,464	123.[illegible]64	123.464
[illegible]	2,675,000		3,199,000	3,247,653	3,391,875	3,548,291	4,344,596	4,287,843	4,379,379	4,560,852	4,758,548	4,952,332	5,165,223	5,358,142	5,627,558	5.[illegible]72.25[illegible]	6.[illegible]42.35[illegible]
[illegible]			46,977	39,676	36,727	33,639	35,686	31,279	27,267	25,866	25,552	26,[illegible]82	26,716	27,9[illegible]	29,[illegible]82	30.525	31.[illegible]43
[illegible]			168,919	166,375	160,191	157,183	159,150	154,743	150,731	148,552	149,325	149,566	152.[illegible]72	151,376	152,646	153,998	155.[illegible]87
[illegible]			8,189,000	8,[illegible]91,850	7,892,421	7,998,568	7,287,885	7,313,478	6,998,625	6,667,492	6,344,47[illegible]	5,822,885	5,788,[illegible]83	5,379,[illegible]12	5,858,824	4,729,[illegible]62	4,422,343
[illegible]			8,191,858	7,892,421	7,998,586	7,287,885	7,313,478	6,998,625	6,667,492	6,344,471	6,022,886	5,788,183	5,379,[illegible]12	5,858,824	4,735,252	4,422,343	4,121,398
[illegible]			8,198,425	8,042,[illegible]35	7,741,584	7,428,756	7,300,237	7,152,847	6,829,258	6,505,582	6,[illegible]83,248	5,661,895	5,[illegible]39,646	5,[illegible]18,966	4,859,842	4,[illegible]75,581	4,26[illegible]57
[illegible]		10.6%	864,[illegible]85	852,466	820,595	788,512	773,825	758,[illegible]17	723,880	689,634	655,423	621,276	587,283	553,[illegible]11	519,258	485,[illegible]59	451,[illegible]34
[illegible]		34.0%	154,343	151,[illegible]65	145,789	140,088	137,479	134,668	128,686	122,522	116,444	110,377	104,323	98,[illegible]54	92,255	86,247	80,[illegible]07

[illegible]

1/ Fuel expense includes cost for an additional 15,000 MLbs for space heating the SAS. Also includes an increase in losses from 86,688 MLbs/yr to 166,374 (66.6%) MLbs. Miller understates losses by allocating the current level of losses to low and high pressure systems based on calculated radiation losses for each system. (See Separate Analysis). Since Miller assumes in this scenario that the current distribution system is left in place, the losses should remain at the current level. Gas prices shown here reflect MDU's March, 1987 DRI based forecast.

2/ Electricity [illegible] is actual SAS use for 12 months ended February, 1987.

3/ Distribution O&M is based on the Staff's Accounting Schedule 12 which includes the 1987 authorized makeover level. Staff's O&M for steam distribution was not separated into labor and materials. Total distribution is shown here with labor and materials for SAS shown separately. SAS maintenance is an average of Miller's estimate and 1986 actual expenses, which reflects the continued use of the current boilers at SAS. Also to reflect continued boiler use, SAS makeover was increased from Miller's 16 to 34.

4/ Chemical [illegible]reatment costs at SAS are approximately 9.84/mlb. rather than 8.19 used by Dahlen.

5/ Property taxes on current plant and the proposed additions were neglected by Dahlen.

6/ Reflects a depreciation on MDU's current net plant and new boiler additions at 20 year life for both.

7/ Reflects a return on MDU's current net plant of 10.6%.

Impact of Adjustments in 1987 ($/mcf)

Increased gas prices to a DRI based MDU forecast	3.27
Increase of SAS O&M	2.85
Increase of distribution O&M	2.58
Inclusion of current net MDU investment	2.36
Increase of electricity for auxiliaries	1.89
Inclusion of station heat and higher level of losses	8.57
Inclusion of property taxes	8.39
Reduction in chemical treatment rate to actual SAS charge	(2.33)
	12.82
Dahlen's estimate	6.51
	19.33

Exhibit 3 cont'd

Exhibit 4

02-Apr-87

EVALUATION OF STAFF CONSULTANT DAHLEN'S
TESTIMONY ON INDIVIDUAL ELECTRIC AND GAS BOILERS
200 BHP BOILERS
1987

	Gas Boiler Per Dahlen	KCPL Adjust	Gas Boiler Per KCPL 1/	Electric Boiler Per Dahlen	KCPL Adjust	Electric Boiler Per KCPL 1/
Installed Cost, $	124,000	176,000	300,000 2/	340,000	(129,154)	210,846 7/
Sales, MLB	5,519	(1,263)	4,256 3/	5,519	(1,263)	4,256 3/
Fuel, $	25,340	1,397	26,737 4/	73,260	(16,765)	56,495 8/
Electricity, $	1,084	0	1,084	141	0	141
Water, Chemical Treatment, $	395	(90)	305 5/	395	(90)	305 5/
Boiler Insurance, $	200	0	200	200	0	200
Floor Space, $	3,450	0	3,450	2,300	0	2,300
Real Estate Tax, $	1,884	2,673	4,557 6/	5,165	(1,962)	3,203 6/
Operations and Maintenance, $	6,100	4,400	10,500 6/	11,500	(3,229)	8,271 6/
Return, Debt Svc, Taxes, $	19,810	28,118	47,928 6/	54,319	(20,634)	33,685 6/
Total	58,264	36,498	94,762	147,279	(42,680)	104,599
Cost Per MLB	10.56	11.71	22.27	26.69	(2.11)	24.58
Assumptions						
Fuel, MMBTU or MWH	8,243	(1,887)	6,356	1,725.24	(394.81)	1,330.43
Fuel, $/MMBTU or $/MWH	3.0742	1.1323	4.2065	0.0425	0.0000	0.0425
Electricity, MWH	9,934	0	9,934	715	0	715
Water, Chemical Treat., $/MLB	0.0716	0.0000	0.0716	0.0716	0.0000	0.0716
Floor Space, Sq. Ft.	600	0	600	400	0	400
Floor Space, $ / Sq. Ft.	5.75	0.00	5.75	5.75	0.00	5.75
Real Estate Tax, %	1.519	0.000	1.519	1.519	0.000	1.519
Maintenance, %	2.50	0.00	2.50	2.50	0.00	2.50
Return, Debt Service, Taxes, %	15	0	15	15	0	15
Return, Debt Serv., Taxes, Yrs.	20	0	20	20	0	20

Exhibit 4

Notes

1/ Boiler size for KCPL adjustment was assumed to be 222 BHP (two 111 BHP at Home Savings).

2/ Reflects installed costs for gas boilers as estimated by Energy Masters Corporation for the Home Savings test site. The installed costs for individual packaged gas boilers are site dependent. Comparison to electic boilers must be for the same site. Gas boiler installed costs can range from $200,000 to $400,000 for a 222 BHP installation depending on flue requirements.

3/ Historical analysis of Home Savings steam sales shows an average for 1982 through 1986 of 4256 MLBs per year ranging from 3485 to 5005 MLBs per year, reflecting Kansas City, Missouri winter heating.

4/ The reduction in sales (note 3) reduces fuel expense. However, gas price has been adjusted to reflect the March, 1986 KCPL forecast of KPL Gas Service charges for large commercial commercial customers ($4.20 including gross receipts tax and sales tax).

5/ The reduction in sales (note 3) reduces water, sewer, and chemical treatment costs.

6/ The increase in installed costs for the boilers (note 2) causes increases in property taxes, maintenance, and return, debt service, and taxes.

7/ The installed costs for electric boilers are the actual cost incurred for the installation of the electric boilers at Home Savings (1006 Grand) for the test project. The installed costs for individual packaged electric boilers are site dependent. Comparison to gas boilers must be for the same site. Electric boiler installed costs can range from $200,000 to $400,000 for a 222 BHP installation.

8/ The reduction in sales (note 3) reduces fuel expense.

Impact of Adjustments in 1987 ($/MLB)

	Gas	Electric
Installation costs	8.27	(6.07)
Effect of reduced sales on expenses	(1.38)	(3.94)
Gas prices	1.69	0.00
Reduced sales	3.13	7.92
	11.71	(2.09)

Exhibit 4 cont'd