Exhibit No.:	
Issue:	Hawthorn 5 Generating Station Explosion
Witness:	Don Scott Norwood
Sponsoring Party:	GST Steel, Inc.
Type of Exhibit:	Surrebuttal Testimony
Case No.:	EC-99-553

Before the

Public Service Commission of the State of Missouri

Case No. EC-99-553

Surrebuttal Testimony of

Don Scott Norwood

On Behalf of

GS Technologies Operating Co., Inc.,

d/b/a GST STEEL COMPANY

Prepared by

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1850 Parkway Place, Suite 720
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April 6, 2000

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I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, TITLE AND BUSINESS ADDRESS.

A. My name is Don Scott Norwood. I am a Principal of GDS Associates, Inc. My business address is 919 Congress Avenue, Suite 800, Austin, Texas, 78701.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I am an electrical engineer with 20 years of experience in the electric utility industry. Prior to and after earning my engineering degree from the University of Texas in 1980, I was employed by the City of Austin's Electric Utility Department (Austin Energy), where I was responsible for electrical design and maintenance projects at three gas-fired power plants. In 1984, I joined the Staff of the Public Utility Commission of Texas (PUCT) as Manager of Power Plant Engineering. In this position, I directed the PUCT Staff's analysis and testimony related to purchased power, resource planning and power plant construction and operational issues. While with the PUCT, I directed a utility/PUCT task force on power plant performance and efficiency standards and was a co-author of the PUCT's initial Statewide Energy Plan for Texas.

In July 1986 I joined GDS Associates as a Project Manager in the firm's Generation Services Department, and in 1990 I became a Principal of the firm. I presently direct the Deregulation Services Department of GDS. During the last

14 years with GDS I have provided consulting services involving regulatory matters, power supply planning, and analysis of deregulated power markets, to a wide range of clients including public utilities, public service commissions, consumer interests, government agencies, power developers and financial institutions. My recent work with GDS has focused on analysis of electric utility restructuring issues, including power plant divestiture, deregulated market price forecasting, power market risk analysis, stranded investment analysis, and electric restructuring policy. My resume is attached as Appendix A.

Q. PLEASE DESCRIBE GDS ASSOCIATES.

A. GDS is an engineering and consulting firm with offices in Marietta, Georgia; Austin, Texas; and Bedford, New Hampshire. GDS provides a variety of services to the electric utility industry, including power supply planning and procurement, electric utility restructuring analysis, rates and regulatory consulting, financial analysis, load forecasting and statistical services. GDS also provides telephone, gas and water utility consulting services. The firm's client base consists mainly of publicly owned utilities, public service commissions and various consumer interests.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am presenting testimony on behalf of GS Technologies Operating Co., Inc. (GST Steel Company).

Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY BEFORE THIS OR OTHER COMMISSIONS?

A. This is my first time to present testimony before the Public Service Commission of Missouri. However, I have testified on electric utility restructuring matters before the Arkansas House of Representatives and in numerous electric utility rate, merger, certification and restructuring cases before state commissions in Arkansas, Georgia, Iowa, Illinois, Michigan, New Jersey, Oklahoma, Texas, Virginia and Wisconsin.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?

A. The purpose of my testimony is to respond to the analysis and conclusions presented in the rebuttal testimony of Kansas City Power and Light Company (KCPL) witness Ms. M. Monika Eldridge of Boulder Power. More specifically, my testimony focuses on Ms. Eldridge's benchmarking analysis and conclusions as presented in her report entitled "Evaluation of Generating Assets Owned and Operated by Kansas City Power & Light Company." (Hereinafter, I will refer to this study as the KCPL benchmarking analysis.)

Q. HAVE YOU PREPARED ANY EXHIBITS WITH THIS TESTIMONY?

A. Yes. I have prepared two Exhibits that are attached to my testimony.

Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

A. In Section II, I provide a summary of my major findings and recommendations. In Section III, I discuss major flaws in the method, assumptions and conclusions of KCPL's benchmarking analysis. In Section IV, I discuss the results of KCPL's benchmarking analysis and show how it supports GST's complaint regarding the recent serious declining trend in KCPL generating unit performance.

II. SUMMARY OF TESTIMONY

Q. PLEASE SUMMARIZE YOUR MAJOR FINDINGS.

A. The KCPL benchmarking analysis is a fatally flawed and thinly documented peer group analysis extending back to 1985. This analysis is presented by KCPL in an attempt to rebut GST's complaint that the recent performance of KCPL's generating units has become increasingly unreliable due to excessive cuts in maintenance spending at plants operated by KCPL. KCPL's benchmarking analysis judges the performance of KCPL's units in comparison to "industry standards" which are defined as the average performance of selected peer group plants. However, contrary to KCPL witness Eldridge's assertions that the peer group plants are similar in design, vintage and size to KCPL's units, many of the selected peer plants are very different than the KCPL generating units to which they are compared. This is because the peer group selection criteria used by

KCPL witness Eldridge did not include numerous factors that can significantly influence the performance and costs of coal-fired power plants. In addition, after applying flawed peer group selection criteria, Ms. Eldridge did not develop summary statistics to assess the validity of reliability performance data for any of her five peer groups. She provided O&M data summary statistics for only the La Cygne 1 peer group, and those statistics indicate that the analysis was not adjusted to remove extremely poor "outlier" performance data that unduly bias the peer group average toward poorer performance. As a result, the peer group averages that set the "industry standard" by which Ms. Eldridge judged the performance of KCPL's generating units are at best highly questionable in terms of their comparability to KCPL's units.

The KCPL benchmarking analysis is designed to mask the recent cost reduction and failing reliability performance trends at KCPL's plants that were the focus of GST's complaint. This masking of the recent declining performance trend was accomplished in two ways. First, the analysis included the performance of the Wolf Creek nuclear station, which is partially owned, but not operated, by KCPL. The trends in costs and performance of Wolf Creek are more consistent with industry norms and are totally different than the trends observed for plants operated and maintained by KCPL. Second, the KCPL benchmarking analysis extended back to 1989 and evaluates performance for rolling three-year average evaluation periods. These techniques emphasize the performance of KCPL's units nearly a decade earlier than the recent period

addressed by GST's complaint, and de-emphasize the recent decline in performance in 1997 and 1998 by averaging it with earlier years.

Due to these serious flaws in the KCPL benchmarking analysis, most of Ms. Eldridge's major conclusions regarding the performance of KCPL's system and individual generating units are invalid. It is clear that the serious declining trend in performance addressed by GST's complaint could not be refuted if the KCPL analysis was based on proper peer groups and had appropriately considered the more recent historical performance of units operated by KCPL which were the major focus of GST's complaint.

Furthermore, the validity of the underlying data and results of KCPL's benchmarking analysis can not be confirmed since Ms. Eldridge apparently has none of the underlying source data for the peer group units, no summary statistics for four of the five peer groups, no documentation of her request to NERC for the peer group reliability data used for the analysis, and only approximately five pages of summary level performance statistics for the more than 1300 unit years of peer group performance data that are considered by the KCPL analysis.

Notwithstanding these serious underlying flaws and the lack of documentation of source data for KCPL's benchmarking analysis, the results in this analysis actually refute Ms. Eldridge's major conclusion that the recent performance of KCPL's system and individual generating units has been within industry standards. In fact, the KCPL study results support GST's complaint that

there has been a significant and noticeable recent negative trend in the reliability performance of KCPL's generating units that has coincided with recent sharp reductions in the Company's maintenance spending for these facilities. In contrast, the recent historical average performance of the KCPL peer group plants generally reflects a modest trend in reduced non-fuel O&M spending coupled with improved reliability performance.

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS.

A. Ms. Eldridge's assertion that the performance of KCPL's generating units falls "within industry standards" is refuted even by her own flawed, biased and thinly documented benchmarking analysis. The recent sharp decline in KCPL maintenance spending coincident with the declining reliability performance of its system, and in particular, its Hawthorn 5 and La Cygne generating units cannot be ignored or justified by misapplied statistics. These disturbing trends, culminating with the catastrophic outage at Hawthorn 5 in February of 1999, clearly justify GST's complaint that the Commission should investigate seriously the adequacy, reliability and prudence of KCPL's management of these facilities, and the resultant impact of these performance problems on KCPL's power supply charges to GST.

III. CRITIQUE OF KCP&L'S BENCHMARKING ANALYSIS

Q. PLEASE DESCRIBE THE BENCHMARKING ANALYSIS PERFORMED BY MS. MONIKA ELDRIDGE FOR KCPL?

A. Ms. Eldridge constructed peer groups of generating units that she asserts are similar to each of KCPL's baseload generating units. She then compared the peer group average forced outage rates (FOR), equivalent availability factor (EAF), non-fuel O&M costs and fuel costs to the performance of KCPL's baseload coal-fired generating units and Wolf Creek nuclear station. These comparisons were made on a three-year rolling average basis, for the period beginning in 1989 and ending in 1998. They were presented to address trends in the performance of KCPL's units and to determine whether the performance of KCPL's generating facilities falls "within industry standards," as defined by the average of peer groups of similar units.

Q. WHAT WAS THE PURPOSE OF KCPL'S BENCHMARKING ANALYSIS?

A. Ms. Eldridge indicates that her analysis was designed to provide an independent evaluation of the performance of generating stations owned and operated by KCPL as well as to address certain specific issues raised by GST's complaint and by the testimony of GST witness Jerry Ward.

Q. WHAT ARE THE MAJOR POINTS OF THE GST COMPLAINT?

A. The major points of the GST complaint are that the recent reliability performance of KCPL's generating units has deteriorated to an unacceptable and substandard level coincident with sharp reductions in maintenance spending and other imprudent actions by KCPL. In light of these disturbing trends and their severe impact on KCPL's power supply costs, GST has requested that the Commission investigate and, if necessary, take actions to improve the future performance of KCPL's units, and to address the excessive charges to GST that have resulted from the apparent past imprudent performance of KCPL's units.

Q. ARE THE METHOD AND ASSUMPTIONS UNDERLYING KCPL'S BENCHMARKING ANALYSIS REASONABLE?

A. No. KCPL's benchmarking analysis incorporates numerous fatal flaws and omissions, including:

- Inappropriate use of a study period that extends nearly a decade before the relevant recent period of declining performance that is the subject of GST's complaint.
- Inappropriate use of rolling three-year average statistics that mask the sharp decline in performance experienced by KCPL units during the last few years.
- Use of inappropriate peer group selection criteria.

- Failure to conduct proper statistical analysis to demonstrate the validity of the selected peer groups.
- Inclusion of units owned, but not operated, by KCPL in the system analysis that is intended to refute GST's criticism's of KCPL's O&M and reliability performance.
- Failure to provide documentation to verify the underlying source data and summary results presented in her analysis, and
- Failure to address the further declining performance of KCPL's units in 1999.

Q. WHY IS IT INAPPROPRIATE FOR THE KCPL ANALYSIS TO CONSIDER THE PERFORMANCE OF ITS UNITS AS FAR BACK AS 1989?

A. GST's complaint specifically relates to the recent cuts in KCPL's maintenance spending and the coincident decline in performance of KCPL's units and its related adverse impact on KCPL's power supply costs. The relevant period to be considered in evaluating GST's complaint would be the last several years when reliability concerns have been manifested, or at most, the six-year period beginning in 1994 when GST entered into its current power supply contract with KCPL and extending through 1999 when the catastrophic boiler explosion at Hawthorn 5 occurred. Instead, KCPL's analysis has evaluated the performance of its units during periods that are virtually ancient history in light of recent industry changes, and more importantly, which are many years before the recent

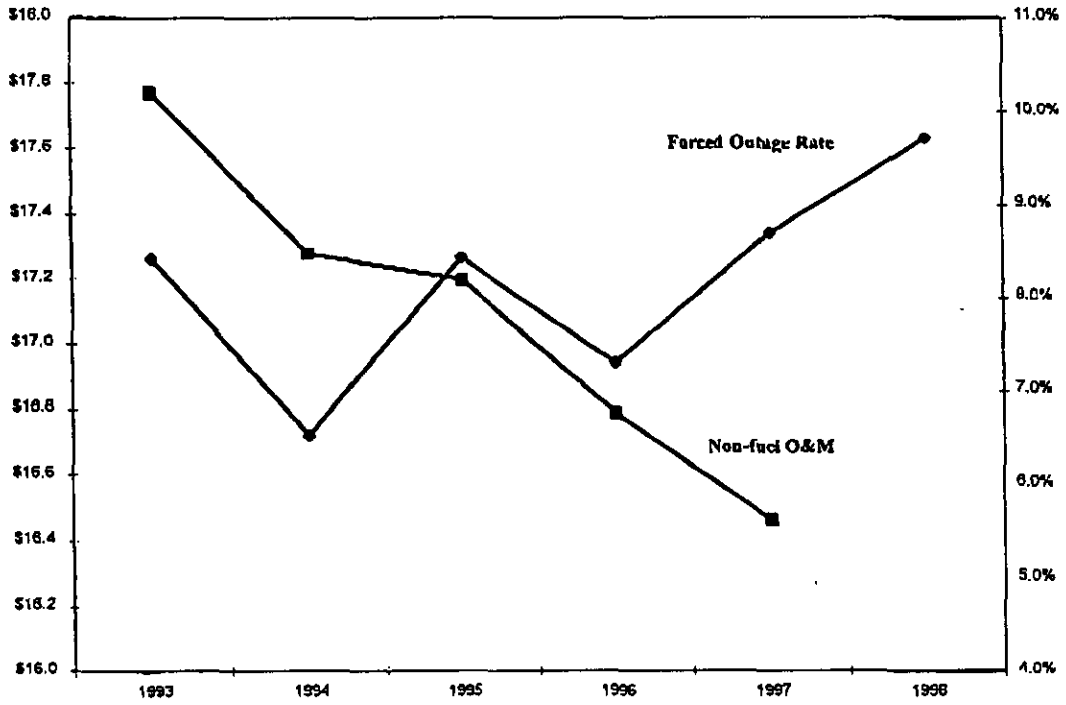
time period addressed by GST's complaint. KCPL's benchmarking analysis also ignores the most recent (1999) continued poor performance of KCPL's units.

Q. PLEASE EXPLAIN YOUR CONCERN WITH THE KCPL'S USE OF ROLLING THREE-YEAR AVERAGE STATISTICS.

A. Again, the focus on GST's complaint is the recent declining trend in KCPL's performance. The rolling three-year average statistics used by the KCPL analysis significantly masks this recent trend by averaging performance of KCPL's units in 1994, 1995 and 1996 – years before and unrelated to GST's complaint – with the more recent and relevant declining performance experienced in 1997 and 1998. As shown by the three-year average performance trend presented below in Figure 1, even under this approach that de-emphasizes the more recent performance of KCPL's units, there is an undeniable and significant declining trend in KCPL's maintenance spending and forced outage rate (FOR) performance for the three-year rolling average periods ending in 1997 and 1998.

Figure 1

KCPL Non-fuel O&M Expenses ($/kW) and FOR Performance



If KCPL's analysis had been presented on a year-by-year basis, or extended to include performance statistics for the three-year period ending in 1999, the study results would have unequivocally supported GST's claim that the recent reliability performance of KCPL's generating units has deteriorated to substandard levels following KCPL's sharp reduction in maintenance spending at these plants.

Q. WHAT ARE THE PROBLEMS WITH KCPL'S PEER GROUP SELECTION CRITERIA?

A. In selecting peer groups for KCPL's units, Ms. Eldridge ignored many factors that significantly influence the non-fuel O&M costs and reliability performance of coal-fired generating stations. Some of the factors she failed to consider include:[1]

- Differences in the type or quality of coal burned at KCPL's plants and the peer group units.
- Interregional labor cost differences that impact non-fuel O&M costs.
- Differences in plant reliability performance that result from differences in the level of non-fuel O&M spending among plants.
- Differences in non-fuel costs resulting from the economies that generally occur at plants with multiple units in comparison to single-unit sites.
- Differences in steam turbine generator design that can impact the reliability and O&M costs of generating units.
- Differences in generating unit reliability and O&M costs that occur due to the fact that a number of the peer group units have scrubbers while only one of KCPL's coal-fired generating units (La Cygne 1) has a scrubber, and

[1] In response to GST's data requests, Ms. Eldridge admits that she did not consider these important peer group selection criteria. See Exhibit DSN-1.

- Differences in inter-utility replacement power costs that may impact the reliability performance and O&M spending of generating units.

KCPL's failure to consider these factors that can have a material impact on O&M spending and reliability performance raises serious questions regarding the validity of its KCPL peer groups.

Q. HOW WOULD PROPER CONSIDERATION OF THE ABOVE FACTORS IN THE SELECTION OF PEER GROUP UNITS HAVE IMPACTED THE RESULTS MS. ELDRIDGE'S ANALYSIS?

A. Ms. Eldridge did not provide any of the unit level source data for her benchmarking study; therefore, it is not possible to adjust her benchmarking results to account for the above factors. However, I believe that proper consideration of the above factors would have improved the peer group average performance (industry standard) and produced results that further support GST's complaint regarding the recent substandard performance of KCPL's units.

Q. PLEASE EXPLAIN THE PROBLEM CONCERNING MS. ELDRIDGE'S FAILURE TO PERFORM PROPER STATISTICAL ANALYSIS OF THE PEER GROUP DATA SHE RELIED ON FOR HER BENCHMARKING ANALYSIS.

A. Ms. Eldridge applied a relatively small number of criteria – primarily size (capacity rating), boiler design, and vintage - to select units for each of the five

KCPL peer groups. In her report, she asserts, without providing supporting analysis, that these factors have a significant impact on plant O&M costs and reliability performance, while failing to consider other factors that can significantly impact plant performance. Compounding these problems, she developed summary statistics only for the non-fuel O&M data for the La Cygne 1 peer group (see Table 4-6 on Schedule MME-1, page 31). She admits that no other summary statistics for non-fuel O&M or reliability performance were developed for any of the other four KCPL peer groups. (see Exhibit DSN-1, Ms. Eldridge's response to GST data request no. GST-14.22). Without summary statistics, it is not possible to confirm that her peer groups are valid and properly screened to remove outlier data that might distort the peer group average results. The lack of summary statistics to support her peer group analysis is a glaring omission that raises further serious questions regarding the validity of the KCPL benchmarking analysis and results.

Q. IS THERE ANY EVIDENCE THAT THE KCPL PEER GROUPS ARE IN FACT INVALID?

A. Yes. Extremely large or small values are referred to as "outliers" in statistical analysis, as they lie outside the bounds of values that can be regarded as normal or typical. Abnormal or atypical data is usually excluded from any statistical analysis so that the results will not be biased. One of the first steps in "cleaning up" any data set for use in a statistical analysis is the elimination of outliers.

In Table 4-6 on page 31 of her benchmarking report, Ms. Eldridge provides summary statistics on the non-fuel O&M costs for the La Cygne 1 peer group. These summary statistics indicate that Ms. Eldridge did not properly screen the peer group data to eliminate outliers. These peer statistics show a mean non-fuel O&M of $26.59 per kilowatt, with a minimum value of $11.56 per kilowatt and a maximum value of $264.60 per kilowatt. The maximum value of $264.60 per kilowatt is vastly larger than the mean, median ($22.92 per kilowatt) or mode ($28.32 per kilowatt) and thus results in undue upward bias of the peer group mean (average). The minimum value is less than one standard deviation from the mean, while the maximum is over 12 standard deviations from the mean. This represents an extremely abnormal distribution, and indicates a poorly constructed peer group.

While Ms. Eldridge did not provide summary statistics for reliability performance or non-fuel O&M for other peer groups, the presence of outlier data in the La Cygne 1 peer group indicates that this data was not properly screened and that there are likely to be similar problems in the data (and bias in the average results) for the other KCPL peer groups.

Q. DO THE ABOVE FLAWS ELIMINATE THE USEFULNESS OF MS. ELDRIDGE'S BENCHMARKING ANALYSIS?

A. Not necessarily. Due to the numerous flaws and lack of source data for individual units, it would be virtually impossible to correct KCPL's benchmarking

analysis so that it would provide results for all of KCPL's units. Considering the bias of the KCPL analysis, it seems almost certain that Ms. Eldridge's assertions that performance of KCPL's system and certain of KCPL's generating units has been at or above industry standards are invalid. However, due to the lack of peer unit source data, this can not be absolutely proven.

On the other hand, if KCPL's benchmarking analysis indicates that the performance of any of KCPL's units is inferior when compared to the study's flawed and biased peer group results, that would provide strong evidence to support GST's claim that the recent performance of KCPL's generating units has been very poor and needs to be addressed by the Commission.

Q. DO THE RESULTS OF KCPL'S BENCHMARKING ANALYSIS INDICATE THAT ANY OF KCPL'S GENERATING UNITS HAVE BEEN PERFORMING POORLY?

A. Yes. As discussed in the next section of my testimony, contrary to the assertions Ms. Eldridge has presented in her report, the benchmarking results indicate that the KCPL system as a whole and certain of KCPL's plants and have recently experienced much higher cuts in non-fuel O&M spending and higher forced outage rates than their relevant KCPL peer groups.

IV. INTERPRETATION OF KCPL BENCHMARKING RESULTS

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. In this section of my testimony, I will discuss the results of KCPL's benchmarking analysis and explain how they support GST's complaint regarding the recent substandard performance of KCPL's generating units. Due to the aforementioned flaws in KCPL's analysis, I will limit my discussion to those units that KCPL's analysis indicates have performed below industry standards.

Q. ARE YOU CONCEDING THAT THE RECENT PERFORMANCE OF THE KCPL SYSTEM, OR CERTAIN OF ITS GENERATING UNITS, HAS BEEN AT OR ABOVE INDUSTRY STANDARDS?

A. No. Again, KCPL's benchmarking analysis is seriously flawed. The peer-group based "industry standards" defined by KCPL in judging the performance of KCPL's units are not valid. The underlying unit source data necessary to correct KCPL's analysis is not available. Therefore, I am not conceding that the non-fuel O&M costs or reliability performance of the KCPL system or of any KCPL-operated generating unit have been at or better than industry standards during the recent period covered by GST's complaint. Furthermore, I am not addressing the performance of the Wolf Creek nuclear station, since this facility is not operated by KCPL and, therefore, the performance of this plant has no relevance

to GST's claim that KCPL's O&M cost cutting and imprudent management has lead to recent deteriorating performance at plants operated by KCPL.

Q. WHAT ARE MS. ELDRIDGE'S MAJOR CONCLUSIONS REGARDING THE OVERALL PERFORMANCE OF THE KCPL SYSTEM?

A. Ms. Eldridge concludes that the overall KCPL system reliability performance has been within or close to industry averages. (See Schedule MME-1, page 11.) She further concludes that the overall KCPL system non-fuel O&M costs have been declining in a manner that is prudent, reasonable, expected, and consistent with industry standards. (See Schedule MME-1, page 12.)

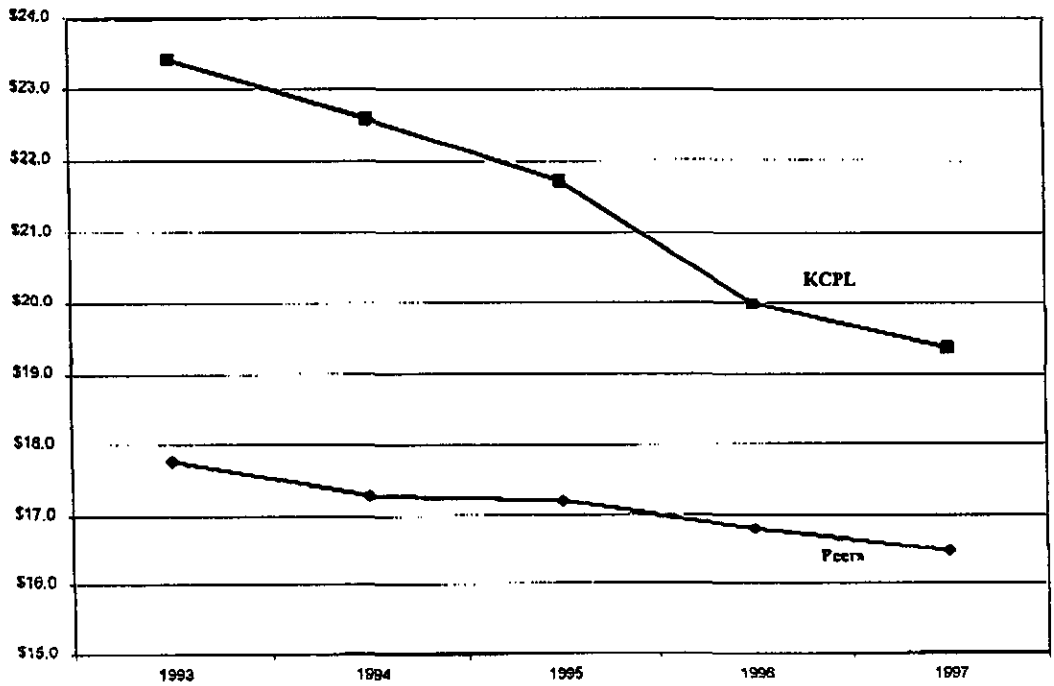
Q. DO YOU AGREE WITH MS. ELDRIDGE'S CONCLUSIONS REGARDING THE OVERALL PERFORMANCE OF KCPL'S SYSTEM?

A. No. Ms. Eldridge's conclusions are founded on flawed analysis that includes Wolf Creek, a plant not even operated by KCPL, that considers performance back to 1989 which has no relevance to the issues raised by GST's complaint, and that incorporates other errors as described earlier in my testimony. However, when her analysis of KCPL's system performance is revised only to eliminate Wolf Creek and to focus on the more recent performance of KCPL's system, the results of her study clearly refute her own conclusions regarding the overall performance of KCPL's system.

As shown below in Figure 2, the non-fuel O&M costs of the KCPL system have been reduced by approximately 17% during the 1993-97 period. This rate of decrease was approximately 2.5 times the decrease experienced by the KCPL peer groups. This evidence refutes Ms. Eldridge's assertion that the declining trend in O&M expenses at KCPL's plants has been reasonable, expected and consistent with industry trends.

Figure 2

KCPL System Non-fuel O&M Performance ($/kW)

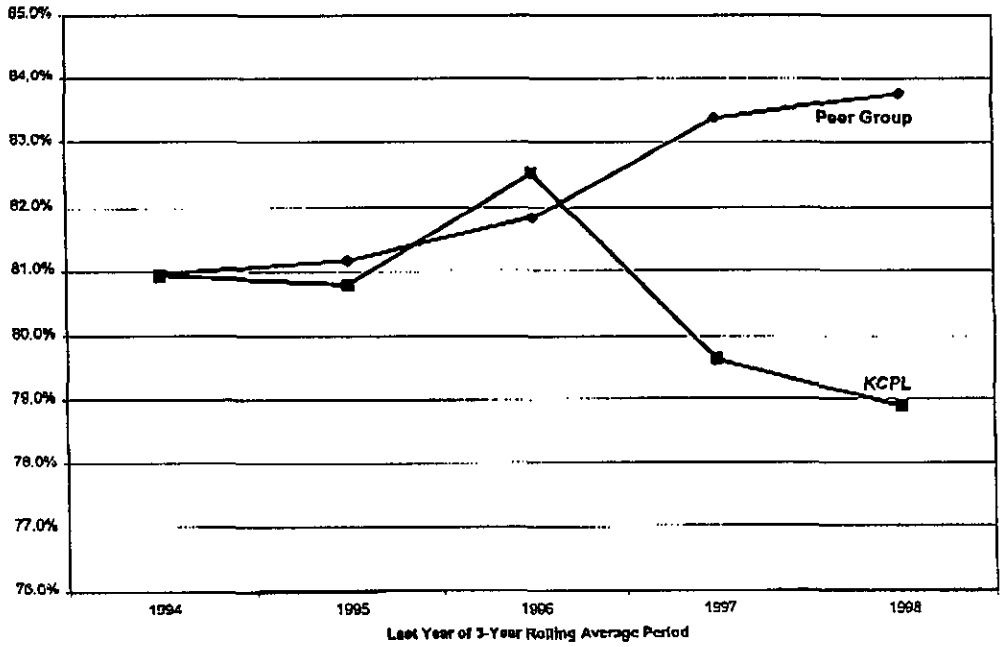


Furthermore, Figure 3 shows that the average equivalent availability (EAF) performance of KCPL's system has trended downward particularly in the last few years and, as of the last 1996-98 evaluation period covered by Ms. Eldridge's

analysis, remained nearly 6% lower (worse) than the peer group average. Again, it should be noted that the 3-year rolling average performance statistics used by the KCPL benchmarking analysis tends to introduce a downward bias on the peer group equivalent availability performance (worsens it) while at the same time masking the severity of the declining availability performance of KCPL's units during the last few years. Because of these factors, the KCPL system EAF performance is even worse than indicated by data presented below.

Figure 3

KCPL System Equivalent Availability Performance

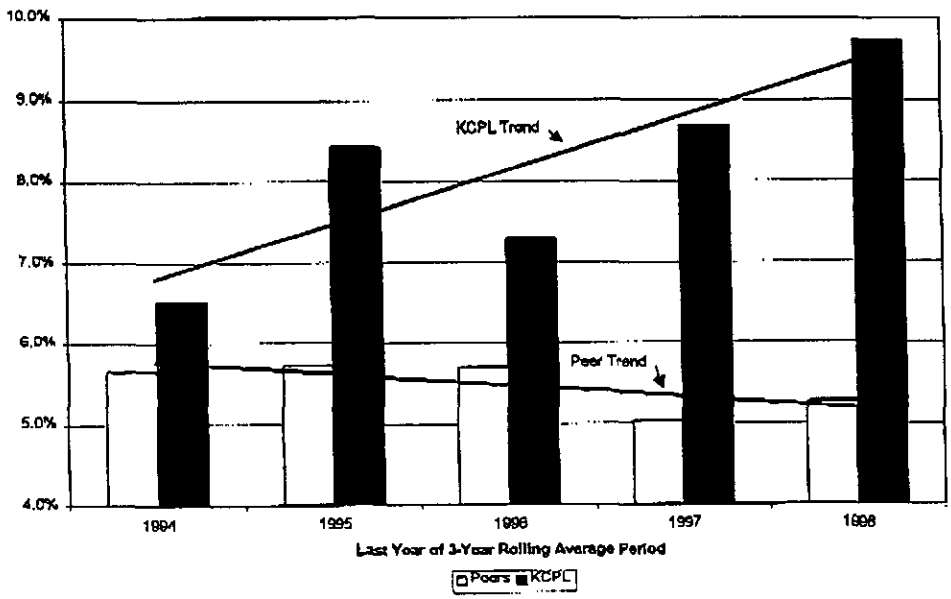


Q. ARE MS. ELDRIDGE'S CONCLUSIONS REGARDING THE KCPL SYSTEM FORCED OUTAGE RATE PERFORMANCE SUPPORTED BY KCPL'S BENCHMARKING STUDY RESULTS?

A. No. Ms. Eldridge has concluded that the KCPL system FOR has always been within a percentage of the industry average and improving in recent years. (See Schedule MME-1, page 11.) However, as shown in Figure 4, the KCPL study results tell a different story. In fact, when the KCPL system analysis is adjusted to remove the bias introduced by Wolf Creek, it is easy to see that the forced outage rates of units operated by KCPL have followed a sharply increasing trend in recent years and were nearly double the rate of the industry average.

Figure 4

KCPL System Forced Outage Rate Performance



Q. DO THE RESULTS OF KCPL'S BENCHMARKING STUDY SUPPORT GST'S COMPLAINT REGARDING THE RECENT DECLINING TREND IN KCPL SYSTEM RELIABILITY PERFORMANCE?

A. Yes. The very essence of GST's complaint is that recent excessive non-fuel O&M cost reductions and imprudent management by KCPL has lead to sharply declining and substandard availability performance of KCPL's baseload coal-fired generating units. As indicated by the above graphical comparisons, KCPL's own benchmarking results support GST's claims. Furthermore, due to the flaws in KCPL's analysis and the further degradation in performance that occurred in 1999, the severity of these trends is actually much more pronounced than suggested by KCPL's benchmarking results.

Q. DO YOU AGREE WITH MS. ELDRIDGE'S POSITION THAT KCPL'S PERFORMANCE SHOULD BE EVALUATED ON A TOTAL SYSTEM BASIS AND THAT IT IS INAPPROPRIATE TO SINGLE OUT DECLINING PERFORMANCE OF INDIVIDUAL UNITS?

A. No. While KCPL's benchmarking results clearly show that there has been significant recent degradation in KCPL system performance, an analysis that focuses solely on the aggregate system performance can mask serious negative performance trends at individual units, such as the 1999 boiler explosion at Hawthorn 5, that merit regulatory attention. In this regard, the subpar overall performance of the KCPL system in recent years does not fully reflect the

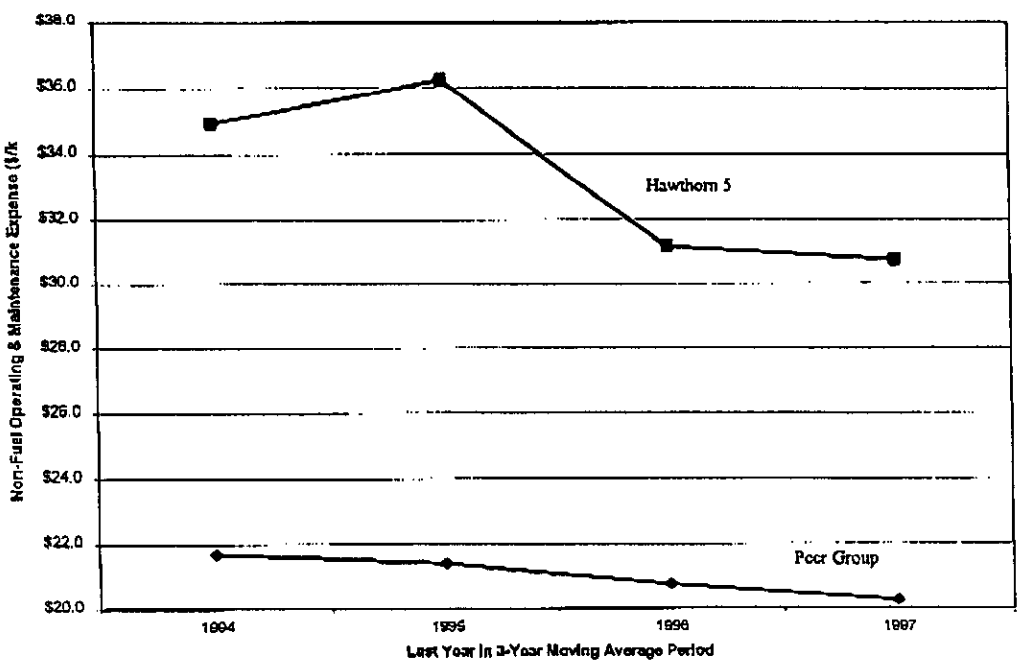
extremely poor performance that has occurred at KCPL's Hawthorn 5 and La Cygne 2 generating units. Together, these two units represent over 36% of KCPL's baseload coal-fired generating capacity.

Q. HOW DO THE RECENT NON-FUEL O&M EXPENDITURES OF HAWTHORN 5 COMPARE TO THE EXPENDITURES OF MS. ELDRIDGE'S PEER GROUP?

A. As shown in Figure 5 below, the non-fuel O&M expenses at Hawthorn 5 have been much higher than that of the Hawthorn peer group, and were as much as 69% higher than the peer group average in the 1995 evaluation period.

Figure 5

Hawthorn 5 Non-fuel O&M Performance, $/kW

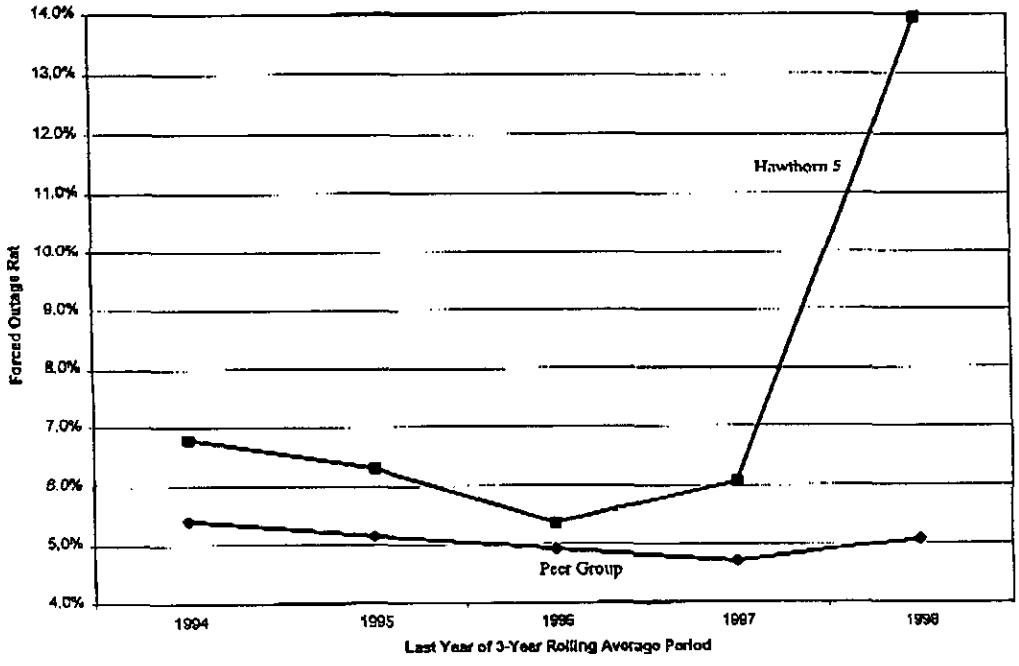


Q. HAS THE HIGH LEVEL OF NON-FUEL O&M EXPENDITURES AT HAWTHORN 5 RESULTED IN SUPERIOR AVAILABILITY PERFORMANCE BY THE UNIT?

A. No. Although the very high level of Hawthorn 5 non-fuel O&M expenditures might be expected to result in a very high level of availability (i.e, high EAF and low FOR), Figure 6 demonstrates that Hawthorn's FOR has been consistently higher than the peer group average and has increased sharply in the last few years, coincident with the sharp decreases in non-fuel O&M expenditures at Hawthorn during this same period.

Figure 6

Hawthorn 5 Forced Outage Rate Performance



Q. DO THESE PERFORMANCE TRENDS AT HAWTHORN 5 FURTHER SUPPORT GST'S COMPLAINT?

A. Yes. The above trends support GST's primary complaint that excessive cuts in KCPL O&M spending has resulted in very poor reliability performance, and may ultimately have contributed to the catastrophic failure at Hawthorn 5 in February of 1999.

Q. DO THE RESULTS OF MS. ELDRIDGE'S ANALYSIS INDICATE SIMILAR RECENT PERFORMANCE PROBLEMS AT ANY OTHER KCPL PLANTS?

A. Yes. As shown below in Figures 7 and 8, the benchmarking results provided by Ms. Eldridge show that La Cygne 2 has experienced a sharp reduction in equivalent availability, as well as a sharp decrease in non-fuel O&M expenditures in recent years. These disturbing trends, further support GST's complaint.

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

A. Yes, at this time.

Figure 7

La Cygne 2 Equivalent Availability Performance

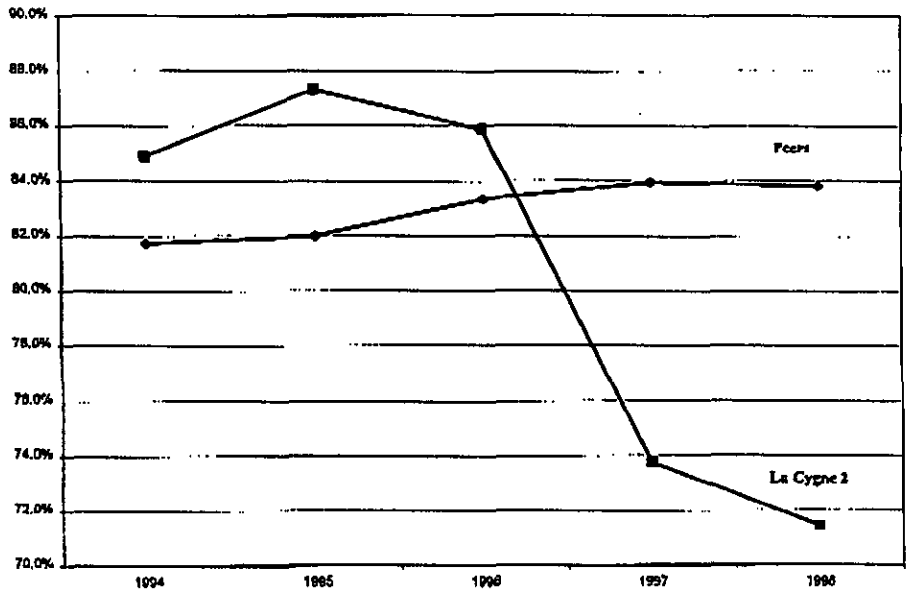
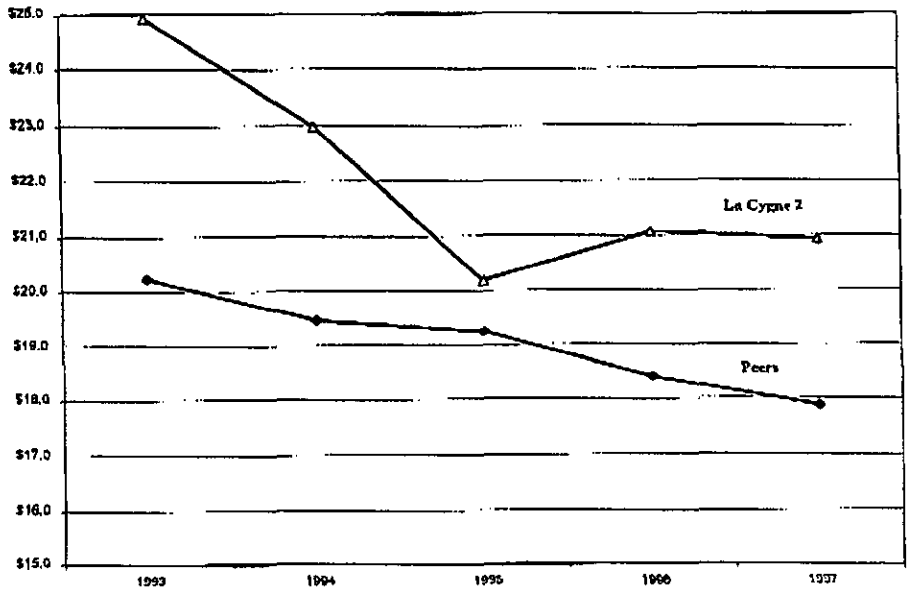


Figure 8

La Cygne 2 Non-fuel O&M Performance ($/kW)



SCOTT NORWOOD

BACKGROUND SUMMARY

Mr. Norwood is a Principal of GDS Associates, Inc. He has a Bachelor of Science degree in Electrical Engineering from the University of Texas at Austin and is a Registered Professional Engineer with over 19 years of electric utility industry experience.

He began his utility career as an electrical maintenance engineer with the Power Production Division of the City of Austin's Electric Utility Department. In this capacity he directed electrical maintenance, design and retrofit projects for three gas-fired power plants. In 1984, Mr. Norwood joined the staff of Public Utility Commission of Texas (PUCT) as Manager of Power Plant Engineering, where he directed analysis of power plant operations, maintenance and construction costs; cogeneration avoided costs; power plant performance and system dispatch; and generation planning issues. He was a co-author of the initial Statewide Energy Plan for Texas.

Mr. Norwood joined GDS Associates in 1986 and was elected a Principal of the firm in 1990. During his tenure with GDS he has provided operations monitoring, audit and budget analysis services for minority owners at two nuclear and five coal-fired power plants; and has presented testimony on power plant O&M, purchased power, electric utility merger and resource planning issues in numerous regulatory proceedings. Mr. Norwood has also directed purchased power solicitations and power plant economic and technical feasibility studies for electric utility clients and directed the development of a nuclear performance incentive program for the Georgia Public Service Commission. He has filed expert testimony on power plant, resource planning and industry restructuring issues in regulatory proceedings in Arkansas, Georgia, Iowa, Illinois, Michigan, New Jersey, South Dakota, Texas, Virginia and Wisconsin.

Mr. Norwood's directs the firm's Deregulation Services Department. His recent work for GDS has been focused on modeling of deregulated market generation prices and analysis of electric restructuring economic and policy issues.

PROFESSIONAL EXPERIENCE

Electric Utility Restructuring/Merger Analyses

- *Western Public Power Producers, Inc.* - Evaluated operational, cost and regional competitive impacts of the proposed merger of Southwestern Public Service Company and Public Service Company of Colorado.

- *Iowa Department of Justice, Consumer Advocate Division* - Analyzed stranded investment and fuel recover issues resulting from a market-based pricing proposal submitted by MidAmerican Energy Company.

- *Cullen Weston Pines & Bach/Citizens "Utility Board* - Evaluated estimated costs and benefits of the proposed merger of Wisconsin Energy Corporation and Northern States Power Company (Primergy).

- *City of El Paso* - Evaluated merger synergies and plant valuation issues related to the proposed acquisition and merger of El Paso Electric Company and Central & Southwest Company.

- *City of Austin Electric Utility Department* - Assisted with regional production cost savings analysis associated with various public power merger alternatives.

- *Rio Grande Electric Cooperative, Inc.* - Analyzed stranded generation investment issues for Central Power & Light Company.

- *Air Liquide America Co.* - Developed power market clearing prices and dispatch forecast based on a regional production cost analysis of the Electric Reliability Council of Texas power market.

- *Tenaska Power Co.* - Developed power market clearing prices and merchant plant dispatch forecast based on a regional production cost analysis of the Electric Reliability Council of Texas power market.

- *American National Power* - Developed power market clearing prices and merchant plant dispatch forecast based on a regional production cost analysis of the Electric Reliability Council of Texas power market.

- *SC Capital Corp.* - Developed power market clearing prices and cogeneration project dispatch forecast based on a regional production cost analysis of the Electric Reliability Council of Texas power market.

Resource Planning and Procurement

- *South Dakota Public Service Commission* - Evaluated integrated resource plan and power plant certification filing of Black Hills Power & Light Company.

- *City of Chicago, Illinois Attorney General, Illinois Citizens "Utility Board* - Analyzed Commonwealth Edison"s proposed sale of the Kincaid and State Line power plants to SEI and Dominion Resources.

- *Electric Power Research Institute* - Evaluated regional resource planning and power market dispatch impacts on rail transportation and coal supply procurement strategies and costs.

- *Georgia Public Service Commission* - Analyzed and presented testimony on purchased power solicitation procedures underlying Georgia Power Company's integrated resource plan in a certification proceeding for a eight unit, 640 MW combustion turbine facility.

- *Shell Leasing Co.* - Evaluated market value of 540 MW western coal-fired power plant.

- *City of Austin Electric Utility Department* - Provided technical assistance in the evaluation of the economic viability of the City of Austin's ownership interest in the South Texas Project.

- *Rio Grande Electric Cooperative, Inc.* - Directed preparation of power supply solicitation and conducted economic and technical analysis of offers.

Power Plant Management

- *Sam Rayburn G&T Electric Cooperative* - Developed and conducted operational monitoring program relative to minority owner's interest in Nelson 6 Coal Station operated by Gulf States Utilities.

- *KAMO Electric Cooperative, City of Brownsville and Oklahoma Municipal Power Agency* - Directed an operational audit of the Oklaunion coal-fired power plant.

- *Sam Rayburn G&T Electric Cooperative* - Conducted a management/technical assessment of the Big Cajun II coal-fired power plant in conjunction with ownership feasibility studies for the project.

- *Kamo Electric Power Cooperative* - Developed and conducted operational monitoring program for client's minority interest in GRDA Unit 2 Coal Fired Station.

- *Northeast Texas Electric Cooperative* - Developed and conducted operational monitoring program concerning NTEC's interest in Pirkey Coal Station operated by Southwestern Electric Power Company and Dolet Hills Station operated by Central Louisiana Electric Company.

- *Corn Belt Electric Cooperative/Central Iowa Power Cooperative* - Perform operational monitoring and budget analysis on behalf of co-owners of the Duane Arnold Energy Center.

- **Utility Benchmarking/O&M Analysis**

- *New York Public Service Commission* - Conducted inter-company statistical benchmarking analysis of Consolidated Edison Company to provide the New York Public Service Commission with guidance in determining areas which should be reviewed in detailed management audit of the company.

- *Residential Ratepayer's Consortium* - Analyzed Fermi 2 replacement power and operating performance issues in 1994 and 1995 fuel reconciliation proceedings for Detroit Edison Company before the Michigan Public Service Commission.

- *New York Public Service Commission* - Conducted inter-company statistical benchmarking analysis of Rochester Gas & Electric Company to provide the New York Public Service Commission with guidance in determining areas which should be reviewed in detailed management audit of the company.

- *City of Houston* - Analyzed and presented testimony regarding fossil plant O&M expense levels in Houston Lighting & Power Company's rate case before the Public Utility Commission of Texas.

- *City of Austin Electric Utility Department* - Analyzed the 1994 Operating Budget for the South Texas Nuclear Project (STNP) and assisted in the development of long-term performance and expense projections and divestiture strategies for Austin's ownership interest in the STNP.

- *City of El Paso* - Analyzed and presented testimony regarding regulatory and technical issues related to the Central & Southwest/El Paso Electric Company merger and rate proceedings before the PUCT, including analysis of merger synergy studies, fossil O&M and purchased power margins.

- *City of Austin Electric Utility Department* - Analyzed and provided recommendations regarding the 1991 capital and O&M budgets for the South Texas Nuclear Project.

- *Residential Ratepayer's Consortium* - Analyzed and prepared testimony addressing coal plant outage rate projections in the Consumer's Power Company fuel proceeding before the Michigan Public Service Commission.

- *Georgia Public Service Commission* - Presented testimony before the Georgia Public Service Commission in Docket 3840-U, providing recommendations on nuclear O&M levels for Hatch and Vogtle and recommending that a nuclear performance standard be implemented in the State of Georgia.

- *Guadalupe Valley Electric Cooperative* - Analyzed and presented testimony on fuel inventory, off-system sales and power plant O&M costs in the Lower Colorado River Authority's rate case before the Public Utility Commission of Texas.

- *Georgia Public Service Commission* - Analyzed and provided recommendations regarding the reasonableness of nuclear O&M costs, fossil O&M costs and coal inventory levels reported in GPC's 1990 Surveillance Filing.

- *City of El Paso* - Analyzed and developed testimony regarding Palo Verde operations and maintenance expenses in El Paso Electric Company's 1991 rate case before the Public Utility Commission of Texas.

- *City of Houston* - Analyzed and developed testimony regarding the operations and maintenance expenses and performance standards for the South Texas Nuclear Project, and operations and maintenance expenses for the Limestone and Parish coal-fired power plants in HL&P's 1991 rate case before the PUCT.

- *City of El Paso* - Analyzed and developed testimony regarding Palo Verde operations and maintenance expenses in El Paso Electric Company's 1990 rate case before the Public Utility Commission of Texas. Recommendations were adopted.

Other Electric Utility Projects

- *Dickson, Carlson & Campillo* - Analyzed Southern California Edison claims of property damage and replacement power costs associated with the hot reheat piping rupture at the Mohave power plant.

- *City of Austin Electric Utility Department* - Assisted with analysis of damages associated with the City's ownership of the of South Texas Nuclear Project.

PUBLICATIONS AND SPEECHES

- *Quantifying Impacts of Electric Restructuring: Dynamic Analysis of Power Markets,* 1997 NARUC Winter Meetings, Committee on Finance and Technology.

- *Quantifying Costs and Benefits of Electric Utility Deregulation: Dynamic Analysis of Regional Power Markets,* International Association for Energy Economics, 1996 Annual North American Conference.

- *Railroad Rates and Utility Dispatch Case Studies,* 1996 EPRI Fuel Supply Seminar.

- *Quantifying Potentially Stranded Costs: Modeling and Policy Issues,* 1996 NASUCA Annual Meeting.

DSN-1

KCPL®

March 28, 2000

VIA OVERNIGHT MAIL

Mr. James W. Brew
Brickfield, Burchette Ritts, PC
1025 Thomas Jefferson Street, NW
8th Floor, West Tower
Washington, DC 20007

RE: Case No. EC-99-553

Dear Mr. Brew:

Enclosed please find KCPL's response to the GST requests listed on the attached sheet. Please note that pursuant to the Protective Order issued in this case, certain documents may have been designated as Highly Confidential.

You may contact me if you have any questions or concerns at (816) 556-2782.

Sincerely yours,

R. E. Williams
Senior Regulatory Analyst

Enclosures
cc: Paul S. DeFord, w/enc.
James P. McGaughy, Jr., w/enc.

DATA REQUEST RESPONSES
INCLUDED IN THIS MAILING
GST COMPLAINT
CASE No. EC-99-553
March 28, 2000

NUMBER	NUMBER	NUMBER
GST-14.1	GST-14.2	GST-14.3
GST-14.4	GST-14.5	GST-14.6
GST-14.7	GST-14.8	GST-14.9
GST-14.10	GST-14.11	GST-14.12
GST-14.13	GST-14.14	GST-14.15
GST-14.16	GST-14.17	GST-14.18
GST-14.19	GST-14.20	GST-14.21
GST-14.22	GST-14.23	GST-14.24
GST-14.25	GST-14.26	GST-14.27
GST-14.28	GST-14.29	GST-14.30
GST-14.31		

RESPONSES TO DISCOVERY REQUESTS

Following are the responses to the discovery requests of Monika Eldridge of Competitive Utility Strategies.

14.1 Ms. Eldridge's resume is included in Appendix A of this report.

14.2 Ms. Eldridge founded Competitive Utility Strategies in October 1999. The number of employees, annual revenues and client information is considered confidential information.

14.3 Competitive Utilities Strategies services are offered in the following areas:

Strategic Planning - develop and implement strategic plans; develop green market strategic plans; develop regulatory strategies; analyze value of generating assets; and coordinate joint ventures with other utilities or companies.

Optimization of Generation Options, including: distributed generation, green power, existing generation shutdown and/or life-extension, and co-generation or combined heat and power.

Project Development, including: analyze options, conduct initial design, establish community support for project, obtain financing and regulatory approval, conduct and supervise detailed design, and complete project installation.

14.4 Ms. Eldridge was employed at the Palisades Nuclear Power Plant for six years and at other CMS power plants previous to that. Her previous employment history is documented in Appendix A.

14.5 This information has been previously provided.

14.6 This information has been previously provided.

14.7 This data was provided by KCPL.

14.8 Operation and maintenance costs are reported as a combined figure. It is impossible to determine the operational and maintenance components separately.

14.9 The performance measures are analyzed over a ten-year time period to account for annual variations, which may be insignificant; however, the averages provided are three-year averages within this ten-year period. Choosing a shorter time period would allow one or two years of data to significantly skew the overall trends of performance. It is necessary to choose a time period which is long enough to represent the true performance trends of a plant, while being short enough to represent the current market conditions.

At the time of the original analysis, cost data for 1998 was not yet available.

14.10 Differences in fuel quality were not specifically addressed by the analysis.

14.11 The peer groups for each unit were selected using a variety of selection criteria, including design criteria. The design criteria were based on the type of boiler manufacturer, with the exception of the La Cygne Unit 1 peers. All peer groups were selected to have the same boiler manufacturer as the KCPL unit for that peer group. La Cygne Unit 1 is a cyclone boiler type. This design was developed to use dirtier coal than other plant designs; however, it also has resulted in higher costs and lower availability, in the industry as a whole. The peer group for La Cygne 1 was composed of all cyclone boilers, regardless of manufacturer.

The initial capital cost of the units was not specifically addressed in this analysis. Only going forward costs were analyzed.

14.12 Differences in fuel transportation costs which impact the total delivered costs of fuel were not specifically addressed by the analysis.

14.13 Differences in inter-regional labor costs were not specifically addressed by the analysis. However, this effect was minimized, because the peer groups contained statistically valid numbers of peers.

14.14 We did not conduct a correlation between performance and spending in this analysis.

14.15 O&M costs are reported on the plant level, rather than on an individual unit level. As a result, it is impossible to determine what each individual unit's costs are. To account for this, the O&M costs reported for each plant were divided equally among the number of units at the plant. The economies of scale related to unit size are significant. The peers for each KCPL unit were chosen such that the average size of the units in a group is close

to the size of the KCPL units. This means that comparison of peer plant costs and KCPL plant costs should not be affected by the economies of scale related to size.

14.16 Differences in turbine design and vendor were not specifically addressed in this analysis. If we had attempted this, the peer groups would have been too small.

14.17 The impact of scrubbers was addressed in the analysis of La Cygne Unit 1, the only KCPL unit with scrubbers. The majority of each peer group units do not contain scrubbers, thus limiting the impact of those units which do.

14.18 Differences in inter-regional environmental compliance standards were not specifically addressed in the analysis.

14.19 Inter-utility replacement power cost differences were not specifically addressed in the analysis.

14.20 All peer group units passed the reserve shutdown screen, which was defined as having 10% or less reserve shutdown hours. The peer groups defined in the analysis all satisfied this criteria. The units presented were the final peers; we did not present the ones which had reserve shutdown hours greater than 10%.

14.21 The availability data were obtained directly from NERC. The only calculations used on the availability data were those which calculated the rolling three-year averages discussed in the report.

14.22 Yearly variations in availability and forced outage performance were not statistically analyzed as in Table 4-6.

14.23 The peer groups were selected partially on the basis of having satisfactory cost data. Satisfactory cost data was defined as having O&M costs reported either for a single unit, or for similar units at a single plant. The economies of scale related to unit size are significant. The peers for each KCPL unit were chosen such that the average size of the units in a group is close to the size of the KCPL units. This means that comparison of peer plant costs and KCPL plant costs should not be affected by the economies of scale related to size.

In addition, costs for plants which included a gas-fired unit were considered unsatisfactory, and the coal-fired unit from that plant was dropped from the peer list.

14.24 These comments have been explained in previously provided reports.

14.25 This assumption has been explained in previously provided reports.