Exhibit No.:
Issue(s): Earnings Review
Load Research
Witness: Lena M. Mantle
Type of Exhibit: Rebuttal
Sponsoring Party: MoPSC Staff
Case No.: EM-2000-292

# ON BEHALF OF THE

# MISSOURI PUBLIC SERVICE COMMISSION

# UTILITY OPERATIONS DIVISION

# REBUTTAL TESTIMONY

# OF

# LENA M. MANTLE

# UTILICORP UNITED INC. AND
# ST. JOSEPH LIGHT & POWER COMPANY

# CASE NO. EM-2000-292

Jefferson City, Missouri

May, 2000

**REBUTTAL TESTIMONY**

**OF**

**LENA M. MANTLE**

**UTILICORP UNITED, INC. AND**

**ST. JOSEPH LIGHT AND POWER COMPANY**

**CASE NO. EM-2000-292**

Q. Please state your name and business address.

A. My name is Lena M. Mantle and my business address is Missouri Public Service Commission, P. O. Box 360, Jefferson City, Missouri 65102.

Q. What is your present position with the Missouri Public Service Commission (Commission)?

A. I am a Utility Regulatory Engineer in the Tariffs/Rate Design section of the Electric Department, Utility Operations Division.

Q. Would you please review your educational background and work experience?

A. In May 1983 I received a Bachelor of Science Degree in Industrial Engineering from the University of Missouri at Columbia. I joined the Commission Staff (Staff) in August 1983. I am a registered Professional Engineer in the State of Missouri. One of my primary responsibilities since 1989 has been the weather normalization of billing month usage, class level hourly loads and net system loads in rate design, rate increase and Staff complaint cases. Over the past 11 years, in the course of weather normalization of class loads, I have worked extensively with load research data from all

of the regulated utilities in Missouri. I have used load research data from St. Joseph Light and Power Company (SJLP) and Missouri Public Service (MPS), a division of UtiliCorp United, Inc. (UCU) on several rate cases, both in rate design cases and in rate increase/excess earning cases.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my testimony is to recommend that the Commission adopt the normalized hourly net system loads of SJLP that Staff used in its earnings review. A monthly summary of these loads is shown on Schedule 1. Staff witness Tom Y. Lin used the normalized hourly system loads as an input to the fuel run that was used to develop fuel and purchased power expense to calculate normalized revenue requirements.

I will also be explaining the detriment to SJLP ratepayers that will occur if the load research program of SJLP is not maintained at its current quality level. To that end, I recommend that, if the Commission allows the merger of UCU and SJLP, the Commission order UCU to:

- continue to treat the SJLP service territory separately from the MPS service territory for load research purposes;
- maintain SJLP's load research program at its current standard of timeliness and quality;
- provide hourly class load data, selected individual customer hourly load research data for the SJLP service territory and the checks and balances performed on that data to the Staff on an on-going basis;
- improve MPS' current load research program to match the current SJLP standard of timeliness and quality; and

- provide hourly class load data, selected individual customer hourly load research data and the checks and balances performed on that data for the MPS service territory to the Staff on an on-going basis.

Q. How is your testimony organized?

A. My testimony contains five sections. The first section, entitled Normalization of the Net System Load, describes my participation in the Staff's earnings review of SJLP in this case.

The next section, entitled General Nature and Importance of Load Research Programs, is general information on load research programs. The next three sections present my testimony relating to SJLP and UCU/MPS load research programs. These sections are entitled Areas of Excellence in the Load Research Program of SJLP, Role of the SJLP Load Research Program Within UCU, and Recommendations Relating to Load Research Programs. This last section also includes reasons for the recommendations.

Q. Are the two issues that you address in your testimony related?

A. In this case the two issues are not related. However, in rate design cases they are intimately related.

## NORMALIZATION OF THE NET SYSTEM HOURLY LOADS

Q. What was your role in the earnings review of SJLP performed in this case?

A. My role in the earnings review of SJLP was to compute normalized net system load for SJLP, beginning with the weather normalization of SJLP's 1999 net system load and reconciling these hourly loads to sales data that was updated from the

SJLP Cases Nos. ER-99-247 and EC-98-573. The hourly loads were provided to Staff witness Lin to use in developing fuel and purchased power expense.

Q. What is net system load?

A. Net system load is the hourly electric supply requirements placed on SJLP to meet the energy demands of its customers.

Q. Why is the net system load normalized?

A. The objective of the normalization of the net system load is to supply normalized hourly loads at the system level for use in estimating SJLP's cost to meet its customers' electric needs.

Q. Please summarize the process used for the normalizing of net system hourly loads.

A. The normalization of the net system load begins with the weather normalization of the actual hourly net system loads to remove the effects of abnormal weather. These hourly loads are then adjusted to correspond to the sum of the annual normalized energy requirements, company usage and losses. A monthly summary of the normalized hourly loads is shown on Schedule 1.

Q. Was the same method used to weather normalize these hourly loads as was used in the last SJLP rate case, No. ER-99-247?

A. The same method was used to weather normalize the net system loads. The same weather was used to calculate normal weather. However, for this analysis 1999 hourly class loads were weather normalized. In Case No. ER-99-247, 1998 hourly class loads were weather normalized.

The method used for reconciling the weather normalized loads to the normalized energy requirements and company usage was the same.

Q. Where did you get the normalized energy requirements?

A. I calculated the total energy requirements by applying a loss factor to normalized sales supplied by Staff witness Janice Pyatte of the Electric Department and to company usage.

## GENERAL INFORMATION ON LOAD RESEARCH PROGRAMS

Q. What is load research?

A. Load research refers to a program designed to provide hourly electric load data for use in calculating hourly class loads. For customer classes whose members are not routinely metered on an hourly basis, the program requires the performance of a number of distinct tasks, such as determining a statistical sampling of customers within each customer class, installing interval data recorders (meters) on the premises of these selected customers, collecting and analyzing the hourly usage data recorded by the special metering, and using statistical techniques to estimate hourly electric load data for each customer class from the data collected on the sampled customers. "Load research data" is the term used to describe the hourly data collected from customers that are specifically a part of the load research program. Class load data is the term that describes the hourly electric load data for each customer class that is estimated from the load research data.

Q. Why is it important that each electric utility company have an on-going load research program?

A. The most obvious cost characteristic of an electric utility company is that the costs of generating electricity varies by the hour (or even shorter intervals). Overall, a load research program helps the utility understand how its customers use energy. Without such data, specialized load analyses could not be performed and certain types of rates could not be billed.

For most customers, the current practice of measuring electricity use is on a monthly basis because monthly data is used for billing customers. However, the monthly data does not provide much useful information about the way in which the customer's usage varies over time. A load research program fills this "information gap" by collecting hourly data on specific customers and uses statistical methods to estimate hourly use by classes of customers.

Q. What is load research data used for?

A. In response to my data request, both MPS and SJLP listed numerous current uses for sample customer load data. Among the uses mentioned were load analyses such as transformer/equipment sizing, outage or usage monitoring, power quality studies, and power factor determination.

The other major use for individual load research data was for billing purposes. The existence of load research data allows customers to be billed for hourly electricity use (real time pricing), for billing by time-of-day periods (SJLP's Large Power rate schedule), and for the monitoring of curtailable customers during curtailment periods.

Q. What is class load data used for?

A. Among the uses that were mentioned in the data request responses I received from MPS and SJLP were resource planning, forecasting, line extension policies, and customer and utility impacts from electric end-uses. In the regulatory arena, class load data is used for weather normalization of class sales and weather normalization of hourly class loads that are used to develop class cost-of-service study allocations.

Q. Will load research data and class load data still be valuable if the electric utility industry is restructured?

A. Yes. If anything, the value of load research data and class load data will increase in a restructured environment. It will be valuable to both the generation provider and to the distribution utility. To be most efficient, the generation provider needs to know what hourly load it needs to provide electricity to meet. Accurate, service area specific load profiles can only be developed through high-quality load research data. For settlement purposes, it will be vital for the distribution utility to know what hourly loads were served so that it can calculate the difference between what was supplied and what was actually used. The better the load research data, the better the load profiles and the smaller the difference.

## AREAS OF EXCELLENCE IN SJLP'S LOAD RESEARCH PROGRAM

Q. Why do you believe that load research program of SJLP is better than the load research program of MPS?

A. I sent out extensive information requests to SJLP and UCU/MPS regarding four aspects of their load research programs, namely:

- sample design,
- collection, management and editing of load research data,
- estimation of hourly class loads from load research data, and
- utilization of load research data and class load data within the utility company

My review of the responses to the information requests was consistent with my working experience. Namely, that of all of the Missouri regulated electric utilities that I deal with on a professional basis, SJLP definitely has the best load research program in two areas that are very important to a user of class load data, such as myself. The two areas that SJLP excels in timeliness and quality which is due in part to its quality control.

Q. What do you mean by timeliness?

A. By timeliness, I am referring to the ability of a company to provide relatively current class load data, whether it be to Staff or internally within the company, on demand. In the data requests that I sent, SJLP reported that as of December 1999, the most current class load data that was available was from October 1999 (two months old). For MPS the most current data available was from December 1997 (two years old). UCU's policy, as stated in a data request response, is to only estimate class load data for MPS on an "as needed" basis.

The timeliness of the development of class load data is also important to the quality of the results. If class loads are developed on a timely basis, errors can be found and corrected while it is still relatively easy to check and, if necessary, correct the information that is used as inputs into the development of the class loads. If the development of class loads takes place two years after the data was collected it is much

more difficult, and sometimes impossible, to find out what caused the problem in the hourly class loads, let alone to correct it.

Q. What do you mean by quality control?

A. By quality control, I am referring to the ease with which the class load data that the utility company supplies to users, such as the Staff, pass "sanity checks." SJLP personnel routinely subject their estimate of hourly class loads to a number of quality checks to see if the results seem "reasonable." By contrast, UCU/MPS has supplied me with class load data that contained obvious errors and, due to the delay in the development of the class loads and the absence of "sanity checks," the reason for the errors was difficult and expensive to determine. This made it necessary for met to change the method that I used to compensate for the bad class load data. This "fix-up" process took considerable time away from my assigned analysis.

Q. Is there anything else that has led you to the conclusion that SJLP has an excellent load research program and MPS does not?

A. Yes. I have found the personnel at SJLP very concerned with the quality of SJLP's class loads and receptive to ferreting out reasons for errors. When Staff has found errors, they always listened, investigated and either corrected the loads or told us why the errors occurred. In contrast, the response from UCU to Staff's request to have errors checked was that it would require an additional expense to have it checked out, and Staff received no answers to why the errors were in the data and no attempt was made by UCU to correct the data.

Q. Has UCU expressed an opinion on SJLP's load research program?

A. Yes. In the Staff's informal transcribed interview with Vern Siemek, Director of Business Services for UtiliCorp Energy Delivery, on March 2, 2000, Mr. Siemek stated that "From the transition team work on St. Joe, I believe that we've found that they had a three-person department that was doing very similar work and high-quality work..." (page 22, lines 11-14). In an internal UCU memo, included as part of the UCU/SJLP Transition Team Report on Regulatory & Legislative Services, Jon Empson, UCU Senior Vice President – Regulatory, Legislative and Environmental Services, reported to Jim Miller, UCU Senior Vice President – Energy Delivery, that "St. Joe has an excellent reputation with the Missouri Commission and provides UCU with an opportunity to improve its own performance."

ROLE OF THE SJLP LOAD RESEARCH PROGRAM WITHIN UCU

Q. What is the UCU merger plan for the SJLP load research program?

A. The information provided to Staff by UCU in response to Staff Data Requests Nos. 1 and 109 indicates that two options to meet the load research requirements of MPS and SJLP after the merger were reviewed by the UCU/SJLP Regulatory & Legislative Services transition team. One option is to expand UCU's current load research contract with the outside consultant Quantum Consulting, which UCU currently uses to collect and provide standard reporting to MPS, to also include similar services for SJLP's load research.

The other option, which the transition team states that it prefers, is to " . . . in-source load research using the St. Joe personnel and processes." This option would

consist of hiring three additional personnel, preferably SJLP personnel, and using SJLP's processes and software. The UCU/SJLP Team Report on Regulatory & Legislative Services noted that load research activity " . . . must be maintained . . . " and that " . . . the Missouri Commission has been very favorably impressed with the performance of St. Joe's load research department and the quality of the data, analysis, and reports."

Q. What is your professional opinion about these alternatives?

A. I believe that the option of expanding UCU's current load research contract using Quantum Consulting to collect and provide the same standard reporting to UCU for the SJLP service territory that is currently done for MPS will result in a degrading of SJLP's load research program and will thus be a detriment to SJLP's ratepayers.

The option to "in-source load research using the St. Joe personnel and processes" is the preferable alternative, but Staff has no assurance that adopting this option will result in a continuation of the timely availability of SJLP class load data, the high quality of the resulting class hourly loads or the receptive responses to Staff's questions regarding load research. UCU's current policy that class load data is only estimated on an "as needed" basis and the poor quality of the MPS class hourly loads is not acceptable.

## RECOMMENDATIONS RELATING TO LOAD RESEARCH PROGRAMS

Q. Could you repeat your recommendations to the Commission in this case regarding the SJLP and MPS load research programs?

A. I recommend that, if the Commission approves the merger of UCU and SJLP, the Commission order UCU to:

- continue to treat the SJLP service territory separately from the MPS service territory for load research purposes;
- maintain SJLP's current load research program at its current standard of timeliness and quality;
- provide hourly class load data, selected individual customer hourly load research data for the SJLP service territory and the checks and balances preformed on that data to the Staff on an on-going basis;
- improve MPS' current load research program to match the current SJLP standards of timeliness and quality; and
- provide hourly class load data, selected individual customer hourly load research data and the checks and balances performed on that data for the MPS service territory to the Staff on an on-going basis.

Q. Why are you recommending that UCU treat the SJLP service territory separately for load research purposes from the MPS service territory?

A. As I understand this proposed merger, both the SJLP and the MPS service territory will maintain its current rate schedules and will be regulated as a separate divisions of UCU. If load research data is not collected separately for each division, the hourly class loads will not be representative of the classes of either of the two divisions.

Q. Why are you recommending that UCU supply the Staff with class load data and selected individual customer load research data on an on going basis?

A. The most straightforward answer is that such a requirement is the best way to assure that this data is available for analysis when Staff needs it. When a company, such as UCU, determines that class loads will only be estimated on an "as needed" (by the

company) basis, it greatly hampers the Staff's efforts to conduct independent investigations.

In addition, editing load research data and estimating hourly class loads is a lengthy and complex process. It is not a process that Staff can accomplish on its own. This is the reason that Staff also wants the results of a standard set of checks and balances.

Q. Can such data be obtained by Staff through the standard data request process?

A. It is currently possible to obtain current class load data representing the SJLP service territory within the 20 working days specified in the existing data request process. My experience with SJLP's load research program is that the most current class load data that is available is rarely more than two months old, the data contains very few obvious errors, and SJLP personnel are quick to investigate data problems that are discovered in the course of my analysis.

My experience acquiring class load data representing the MPS service territory has been much different. The existing data request process between the Staff and MPS has not worked well in this situation because, in essence, a request for class load data is a request for data that the utility does not possess. MPS' response to such a data request can be to either maintain that such data is unavailable [which, given the policy of only creating the data on an as needed basis, is true] or create such data. The latter response is typical from MPS but, while more cooperative to Staff and intervenors, generally requires considerably more time than 20 working days to accomplish.

Q. Will the detriment to the ratepayers of SJLP end if load research data, class hourly loads and checks and balances are sent to Staff on a monthly basis?

A. No, it will not. The purpose of this recommendation is primarily directed to retaining the timeliness of SJLP's load research program. I have also recommended that the current standard of quality of SJLP's load research program be maintained. In addition to statistical standards, I am referring to the responsiveness of SJLP's personnel and a commitment by the management of UCU to a quality load research program.

Q. You also recommend that UCU improve MPS's load research program. Why?

A. As with any analysis, the better the input data the better the output of the analysis. The many current and futures uses of load research data within MPS will be of better quality if the load research program is improved.

Q. Would in-sourcing the load research program by UCU take care of your concerns?

A. While it is a much better option than outsourcing the load research program, I still have some concerns with this approach. Currently SJLP utilizes three personnel in its load research program, which is the number of personnel that the transition team recommends UCU hire for load research. My concern is that these three personnel will be required to continue SJLP's load research program and in addition will have to take on MPS's load research program and the load research programs of other UCU divisions. Spreading three personnel so thinly will make it impossible to maintain the current timeliness and quality of SJLP's load research program.

Q. Can some standards be set for the quality of the load research programs of both SJLP and MPS?

A. Yes. There are some standards that can be set pertaining to the sampling of customer classes and statistical accuracy of the load research data. Staff and UCU personnel could work together to set these standards.

Q. Does this conclude your rebuttal testimony?

A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

| | | |
|---|---|---|
| In the Matter of the Joint Application of | ) | |
| UtiliCorp United Inc. and St. Joseph | ) | |
| Light & Power Company for Authority to | ) | |
| Merge St. Joseph Light & Power Company | ) | CASE NO. EM-2000-292 |
| With and into UtiliCorp United Inc., and, | ) | |
| In Connection Therewith, Certain Other | ) | |
| Related Transactions. | ) | |

AFFIDAVIT OF LENA M. MANTLE

STATE OF MISSOURI )
) ss
COUNTY OF COLE )

Lena M. Mantle, of lawful age, on her oath states: that she has participated in the preparation of the foregoing written testimony in question and answer form, consisting of 15 pages of testimony to be presented in the above case; that the answers in the attached written testimony were given by her; that she has knowledge of the matters set forth in such answers; and that such matters are true to the best of her knowledge and belief.

Lena M. Mantle
Lena M. Mantle

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

SHARON S WILES
NOTARY PUBLIC STATE OF MISSOURI
COLE COUNTY
MY COMMISSION EXP. AUG. 23,2002

Sharon S. Wiles
Notary Public

My commission expires_____

# St. Joseph Light and Power Company
## Net System Load
## Normalized Test Year
EM-2000-292

| Month | Monthly Usage (MWh) | | | | Monthly Peaks (MW) | | | | Load Factor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Actual | Normal | Adj | % Adj | Actual | Normal | Wthr Adj | % Adj | Actual | Normal |
| 9901 | 170,036 | 172,508 | 2,472 | 1.45% | 316 | 317 | 0.59 | 0.19% | 0.723237 | 0.732385 |
| 9902 | 134,651 | 146,376 | 11,725 | 8.71% | 271 | 311 | 40.33 | 14.88% | 0.739386 | 0.699651 |
| 9903 | 142,743 | 142,376 | (367) | -0.26% | 260 | 259 | (0.78) | -0.30% | 0.737919 | 0.738246 |
| 9904 | 126,808 | 128,063 | 1,255 | 0.99% | 238 | 240 | 1.55 | 0.65% | 0.740009 | 0.742508 |
| 9905 | 129,188 | 132,780 | 3,592 | 2.78% | 220 | 262 | 42.10 | 19.14% | 0.789272 | 0.680914 |
| 9906 | 152,394 | 157,714 | 5,320 | 3.49% | 326 | 336 | 10.25 | 3.14% | 0.649259 | 0.651447 |
| 9907 | 194,909 | 186,377 | (8,532) | -4.38% | 388 | 383 | (5.18) | -1.33% | 0.675192 | 0.654367 |
| 9908 | 179,872 | 179,126 | (746) | -0.41% | 369 | 374 | 4.89 | 1.33% | 0.655185 | 0.643925 |
| 9909 | 143,644 | 145,388 | 1,744 | 1.21% | 342 | 322 | (20.34) | -5.95% | 0.583350 | 0.627770 |
| 9910 | 137,247 | 136,496 | (751) | -0.55% | 237 | 239 | 2.07 | 0.87% | 0.778362 | 0.767397 |
| 9911 | 133,076 | 139,631 | 6,555 | 4.93% | 240 | 256 | 15.63 | 6.51% | 0.770116 | 0.758635 |
| 9912 | 156,688 | 164,042 | 7,354 | 4.69% | 295 | 308 | 13.28 | 4.50% | 0.713906 | 0.715222 |
| Annual | 1,801,256 | 1,830,874 | 29,618 | 1.64% | 388 | 383 | (5.18) | -1.33% | 0.529956 | 0.545955 |
| Summer | 670,819 | 668,604 | (2,215) | -0.33% | 388 | 383 | (5.18) | -1.33% | 0.59047642 | 0.596486 |
| Other | 1,130,437 | 1,162,271 | 31,834 | 2.82% | 316 | 317 | 0.59 | 0.19% | 0.61339717 | 0.62949498 |

Schedule 1