BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Application of Rocky Mountain Power for Authority to Increase its Retail Electric Utility Service Rates in Utah and for Approval of Its Proposed Electric Service Schedules and Electric Service Regulations	))))))))	**Docket No. 09-035-23** **DPU Exhibit No. 9.0**

Direct Testimony of

Jonathan Nunes

For the Division of Public Utilities

Department of Commerce

State of Utah

October 8, 2009

I. INTRODUCTION

Q. Please state your name and occupation.

A. My name is Jonathan Nunes. I am employed by R. W. Beck, Inc., a division of Science Applications International Corporation, as a Senior Economist.

Q. What is your business address?

A. 1000 Legion Place, #1100, Orlando, Florida, 32801.

Q. On whose behalf are you testifying?

A. The Utah Division of Public Utilities ("Division").

Q. Please describe your position and duties at R. W. Beck?

A. As a Senior Economist in R. W. Beck's Management and Economic Consulting practice area, my primary work consists of providing consulting services to electric utilities in the fields of power supply planning and energy market forecasting.

Q. Please describe your education and work experience.

A. I hold a Master of Arts degree in Applied Economics from the University of Central Florida. Prior to that, I earned a Bachelor of Science in Business Administration with an emphasis in Economics. I began working at R. W. Beck as an energy market analyst in the fall of 1993. Since then, I have prepared load forecasts and related analyses for over 200 utilities across the contiguous United States and Alaska, as well as other work for utilities in other subject areas. A copy of my resume and testimony presented in various regulatory arenas is attached as DPU Exhibit 9.1.

II. PURPOSE OF TESTIMONY

Q. What is the purpose of your Testimony?

A. My testimony consists of a review of the Rocky Mountain Power (the Company) customer, sales, and system load forecast and the Company's load research program that supports rate class demands in this proceeding.

III. CUSTOMER, SALES, AND SYSTEM LOAD FORECAST

Q. Please summarize your findings pertaining to the Company's customer, sales, and system load forecast?

A. The Company's methodology is generally reasonable and represents common practice in the electric utility industry. Certain aspects of the Company's forecast, notably the methodology and assumptions with respect to the forecast for the residential class could not be adequately scrutinized as a result of lack of responsiveness by the Company to discovery requests. In particular, the Company's responses to Data Requests DPU 19.1 and DPU 32.1 were not sufficiently helpful. However, the Company's methodology with respect to its industrial class is problematic in certain respects and has resulted in an overstatement of that portion of the sales forecast.

Q. Please describe any problematic issues with the Company's sales forecast for the industrial class.

A. First, the Company relies solely on a subjective process, which cannot be independently replicated or subjected to external review or scrutiny, for the major portion of the class representing its larger customers, or approximately 75 percent of the overall industrial class sales. In addition, the process is time consuming and therefore potentially not

representative of updated conditions by the time the data are to be used in a downstream planning analysis (e.g., a cost of service study). The Company's typical methodology for forecasting the large industrial class consists of obtaining information regarding expected future loads and operations from those customers directly or through customer account managers. For purposes of this proceeding and the last rate case, Docket 08-035-38, the Company relied on a review of the 2000-2001 recession and consultations with the customer account managers to develop monthly adjustments to the sales forecast (developed as discussed previously). The monthly downward load adjustments ranged from 6 to 13 percent and averaged 8.8 percent over the test year.

Q. How appropriate is this review of the 2000-2001 recession as a basis for the adjustment the Company has made?

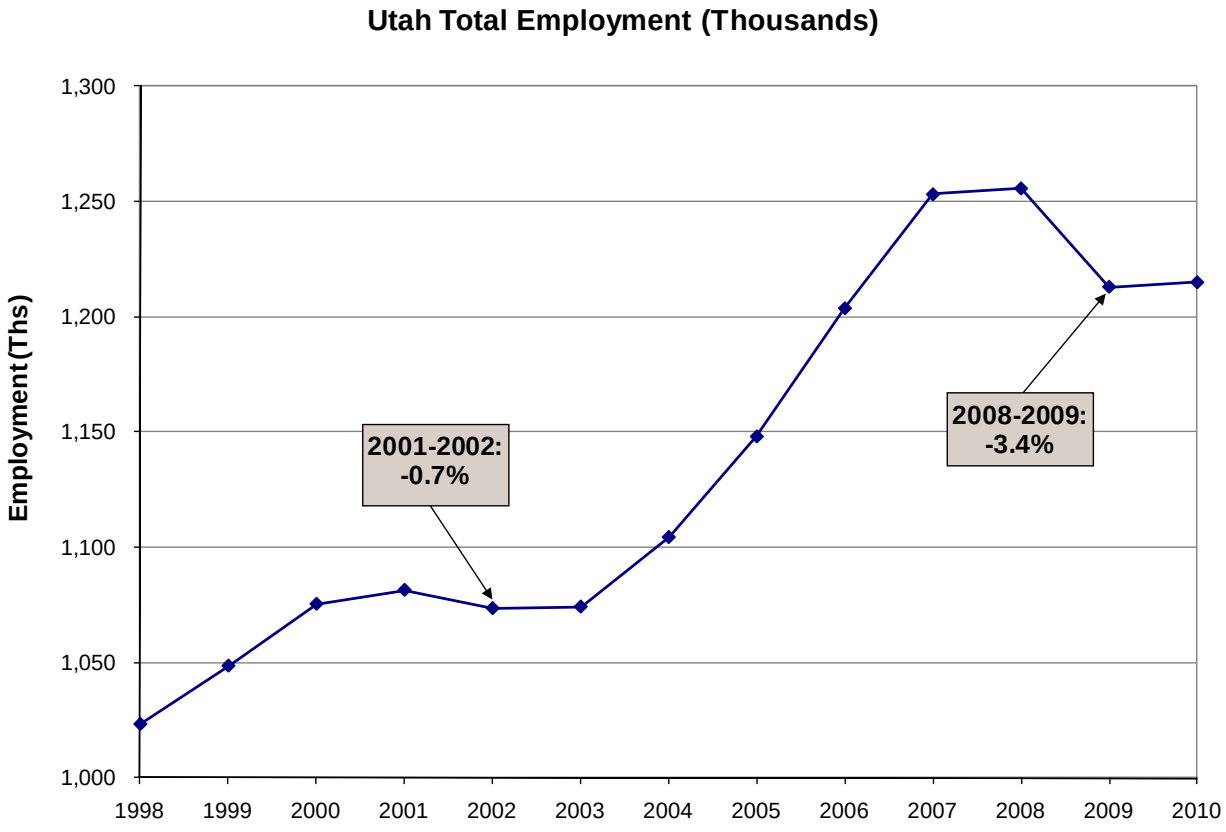
A. The predominant view is that the current recession, which began for the U.S. overall in November 2007, has been far deeper and longer than the 2000-2001 recession. In fact, the U.S. economy appears only now to be recovering in certain respects, and rather anemically by historical standards. Comparisons pertaining to the Utah economy and Utah's manufacturing base, in particular, are not as dramatic but still reflect that the current recession is more severe than the 2000-2001 recession. Importantly, as the recession has unfolded and at least through September 2009, projections appear to have been continuously revised downward by many economic forecasting firms.

Q. What details regarding the Utah economy can you provide?

A. Figure 1 below depicts the trend in total employment in Utah, focusing on the percentage change in employment from 2001-2002 and from 2008-2009. The former shows a decline

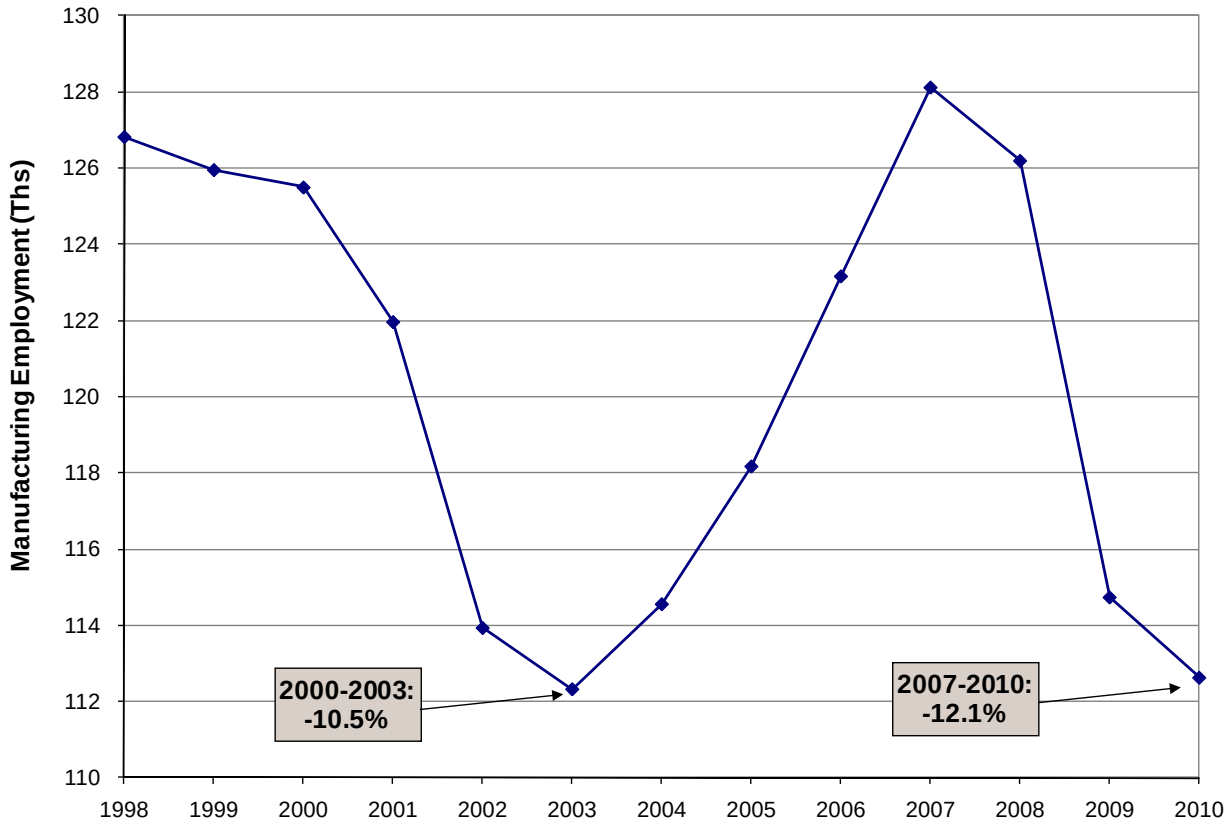
in employment of only 0.7 percent, while the latter shows a decline of well over 3 percent, recognizing that a portion of 2009 is projected (approximate date of the projection is September 2009). Figure 2 depicts the trend in manufacturing employment in Utah. In this case, the recessionary pattern in the 2000-2003 period appears fairly similar to the 2007-2010 period, recognizing that 2010 data are projected. The percentage difference between 2000 and 2003 in manufacturing employment is -10.5 percent, and between 2007 and 2010 is -12.1 percent.

Figure 1: Utah Employment (Thousands)



Source: IHS Global Insight (September 2009).

Figure 2: Utah Manufacturing Employment (Thousands)



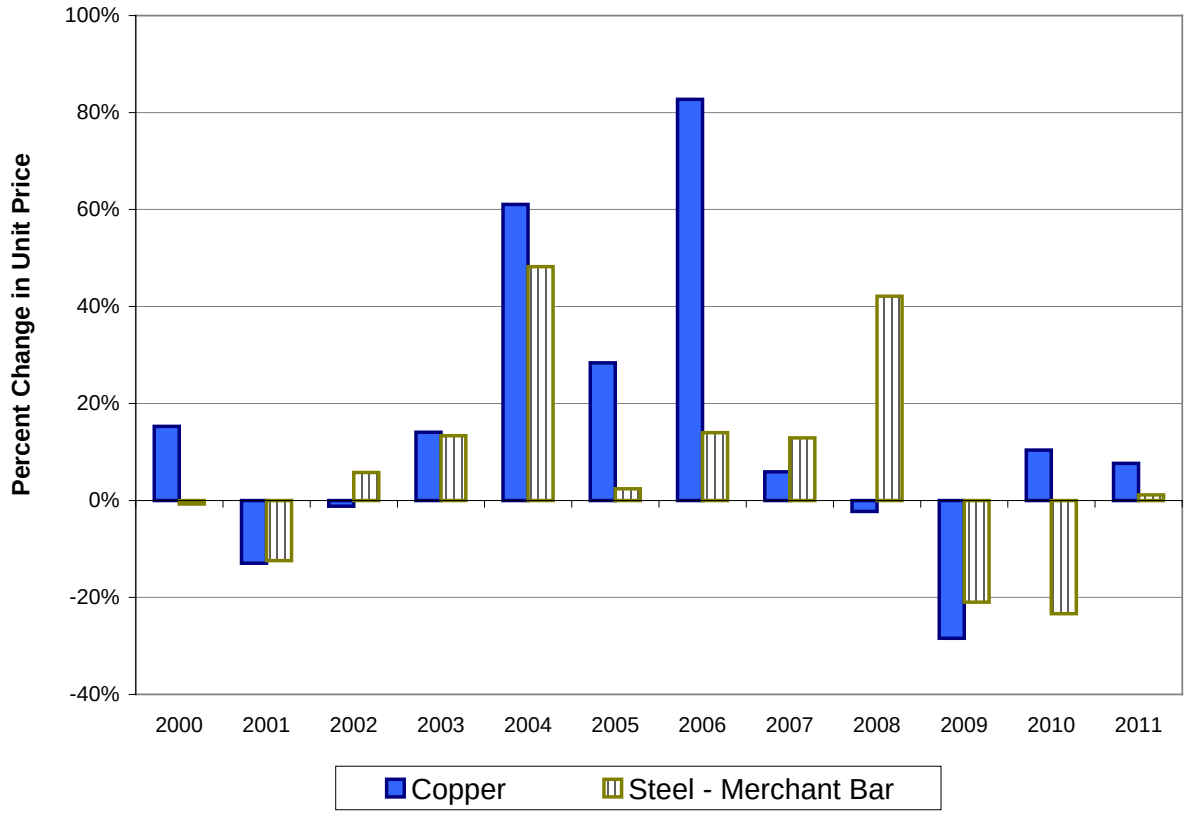
Source: IHS Global Insight (September 2009).

Q. What other comparative data are useful to analyze?

A. An important industrial sector served by the Company is the metals industry, which has been particularly volatile during this economic cycle, along with the market for most other commodities. This has been most readily seen in worldwide commodity prices and has also strongly affected metals production in the U.S. Figure 3 depicts the annual percentage change in spot metals prices in the U.S. Note the much sharper negative values in the 2009-2010 period than in the 2001-2002 period. Figure 4 depicts annual indices related to metals production in the U.S. Note the sharp drop-off in production reflected in the 2009-

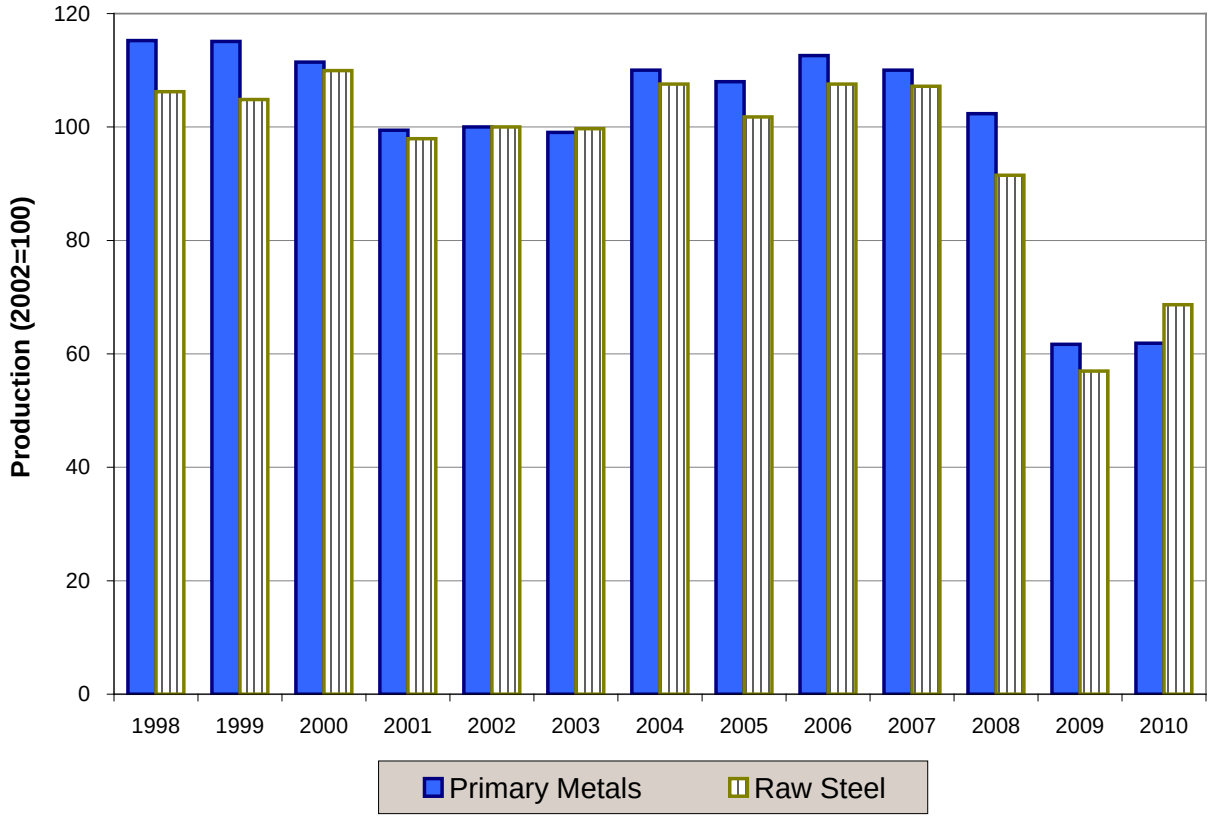
2010 period, which differs from the very shallow decline in production reflected over the 2001-2003 period.

Figure 3: Percentage Change in Metals Prices



Source: IHS Global Insight (September 2009)

Figure 4: U. S. Metals Tonnage Production Indices (2002=100)



Source: Moody's Economy.com (August 2009)

Q. What conclusions can you draw from these data?

A. Most of the industries served by the Company are likely to be highly capital-intensive rather than labor-intensive. Therefore, data pertaining to actual production are most useful in drawing conclusions about electricity demand. In situations in which the pricing of goods sold is highly volatile, it is also more appropriate to focus on the quantity of goods produced rather than the total market value of production (i.e., contribution to gross domestic product measured in dollars). Given that, the metals production chart above, Figure 4, adheres to those principles most closely and shows clearly that the current

recession was much more severe than the 2001-2002 recession, particularly as it affects the electricity demand of a significant portion of the Company's industrial customer base. However, in order to bring these disparate elements together to measure their combined impact on the Company's industrial sales, a more detailed analysis is required.

Q. Have you performed such an analysis?

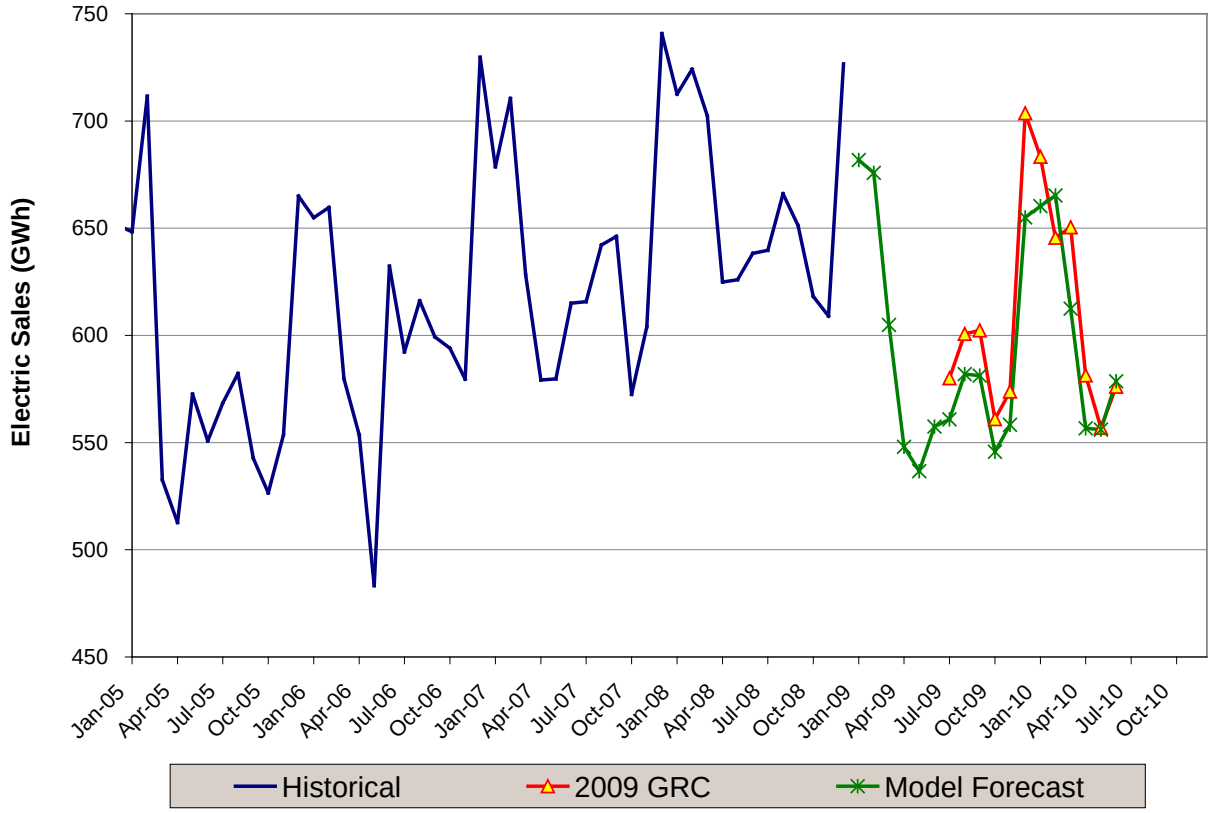
A. Yes.

Q. Please describe this analysis.

A. I developed a regression equation, shown in Exhibit 9.2, to forecast the Company's total industrial sales as a function of several economic driving variables, including Utah manufacturing output, U.S. primary metals production, U.S. refined copper production, and the average real price of electricity experienced by industrial consumers in Utah. The equation also includes several binary variables to capture seasonality in sales that is largely not weather-related. The primary seasonal factor is generation from a coal-fired generating resource owned and operated by Kennecott Utah Copper, LLC (Kennecott), to meet a portion of its power requirements. The regression equation explains approximately 86 percent of the variation in monthly sales and has a mean absolute percent error of 3.0 percent.

Figure 5 below depicts the resulting monthly forecast through June 2010, as compared to the Company's forecast, which includes its adjustments to account for the recession. The results are remarkably close in some months but are generally lower over the test year, July 2009-June 2010, by about 2.8 percent and in some months by 6-7 percent.

Figure 5: Industrial Sales Forecast Comparison



Q. What are your conclusions from this comparison?

A. This analysis suggests that the Company has under-estimated the impact of the on-going recession on its industrial customers. The results are fairly consistent with the variance between the Company's forecast and actual sales over January through July 2009 for the industrial class of 2.4% (i.e., industrial sales have been over-forecasted by 2.4%).[1] I would recommend that, for this rate case, the Company should revisit its forecast for the industrial class and, if differences in cost of service warrant, revise its filing accordingly.

[1] Source: the Company's response to DPU 12.4.

Q. Why did you not use metals production data specific to the State of Utah in this analysis or in Figure 4?

A. Gross product associated with the metals industry by state is only reported with a significant lag, such that data through 2007 only is available from the federal government. In addition, as this data is dollar-denominated, its usefulness in load forecasting may be limited. Actual tonnage data is not readily available at the state level based on my research. Finally, while IHS Global Insight (the Company's economic data provider) provides historical and projected data for a metals production index, the basis of the data and source of the historical data is unclear and the data appear to suffer from the same lag in historical data reporting at the state level discussed above. However, metals production in Utah should be sufficiently correlated with national metals production as both serve the same markets and are impacted by many of the same variables.

Q. What are your conclusions from this overall analysis?

A. The regression equation I developed demonstrates that, although the Company's industrial class is more complex than can be explained by a simple variable like manufacturing employment or output alone, an econometric approach using multiple explanatory variables that reflect upon the important components of the Company's load is viable and, as important, transparent and objective. Longer term, the Company should replace or augment its time-consuming and subjective forecast process for the large industrial class with an econometric approach similar to my approach discussed above. For example, an econometric approach could be used by the Company to serve as a benchmark to its current process and to provide more timely results for adjustment purposes as necessary. It might

also be warranted to reduce the number of customers for which loads are forecasted on the basis of this qualitative and subjective process and instead include them in the regression-based process used for the smaller industrial customers. This could reduce the required effort and improve the timeliness and quality of the forecasts for the remaining large customers, particularly as the largest customers may have contractual obligations to provide short- to medium-term forecasts to the Company, significant deviations from which may result in additional cost.

Q: Is there another reason why a change is desirable?

A: Yes. The current method relies upon information that is gathered through informal processes and communications involving the Company's account managers. It aggregates their subjective judgments, gathered over time and not necessarily up-to-date. The information upon which industrial forecasts are constructed is neither available to parties in this case, not is it auditable or verifiable. This leaves non-Company parties at an inherent disadvantage in evaluating the Company's industrial load forecasts and all of the results that flow from them.

Q. What new information or factors might change your conclusions?

A. While the regression equation itself is subject to fairly small errors, particularly in any consistent direction from month-to-month, the accuracy of the forecast relies in large part on the accuracy of the projections of the underlying independent variables. These projections are subject to change as events unfold and updated projections become available. The metals industry, in particular, is subject to considerable volatility, and the level of uncertainty for this industry in the current economic environment is probably

greater than is typical. It is possible that updated data, other variables, or other sources of the same variables might be introduced into this analysis that may impact the resulting forecast. However, this forecast relies on the best information available at this time and is considerably more up-to-date than information relied on by the Company in its forecast. In addition, the future operation of Kennecott's self-generation may cause Kennecott's net power requirements to be somewhat different. The Company may be aware of plans or expectations in this regard that are not explicitly addressed in the forecast I have produced.

IV. LOAD RESEARCH PROGRAM

Q. What is your opinion of the Company's load research program?

A. The Company purports to be designing its load samples for the non-demand metered classes to meet a PURPA standard, discussed in Mr. Thorton's testimony, which mandates that samples be designed so that 90 percent of population load estimates are within 10 percent of actual loads. While the Company may be designing samples in an appropriate way to meet this standard, the resulting estimates from their samples over the last several rate cases and this case do not appear to be meeting the standard.

Q. Is the Company designing samples in an appropriate way?

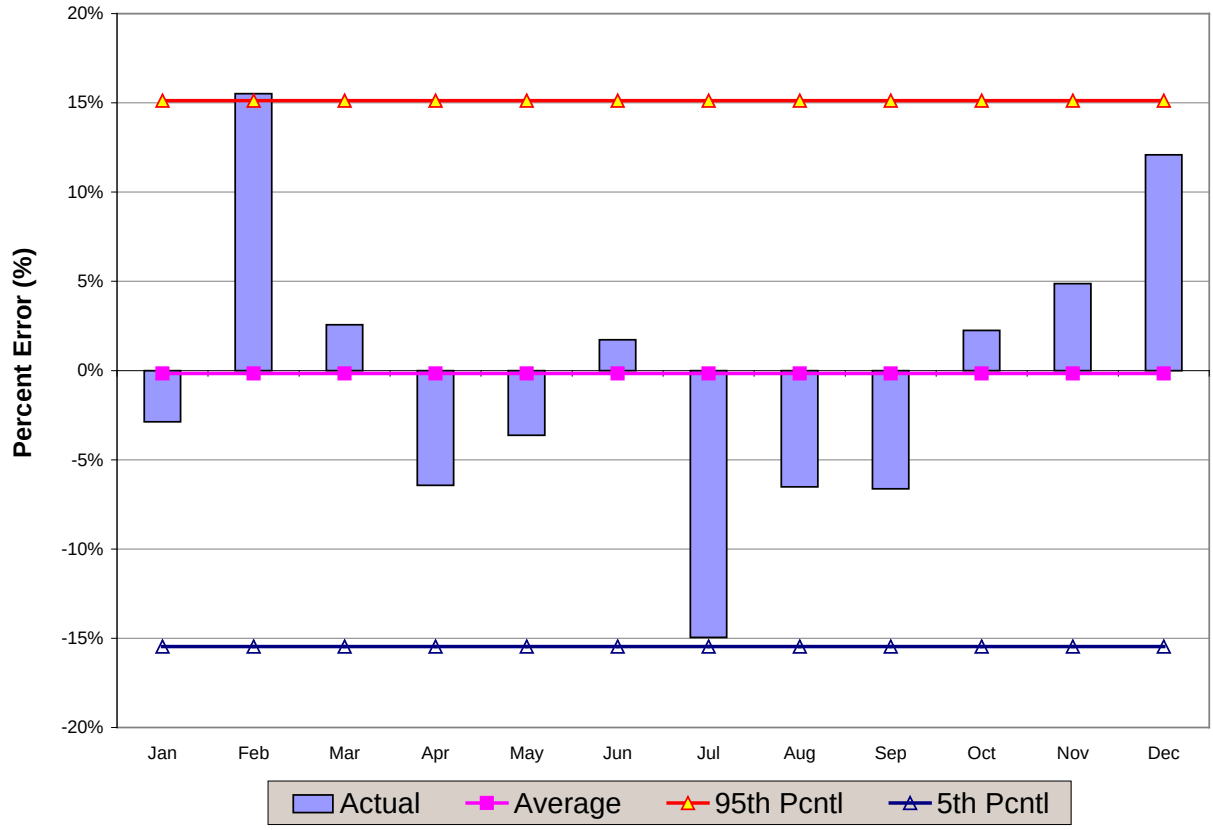
A. I do not have an opinion on that yet. Pending discovery may provide information on this topic that may help in that regard.

Q. What evidence can you present that the resulting estimates are not meeting the PURPA standard?

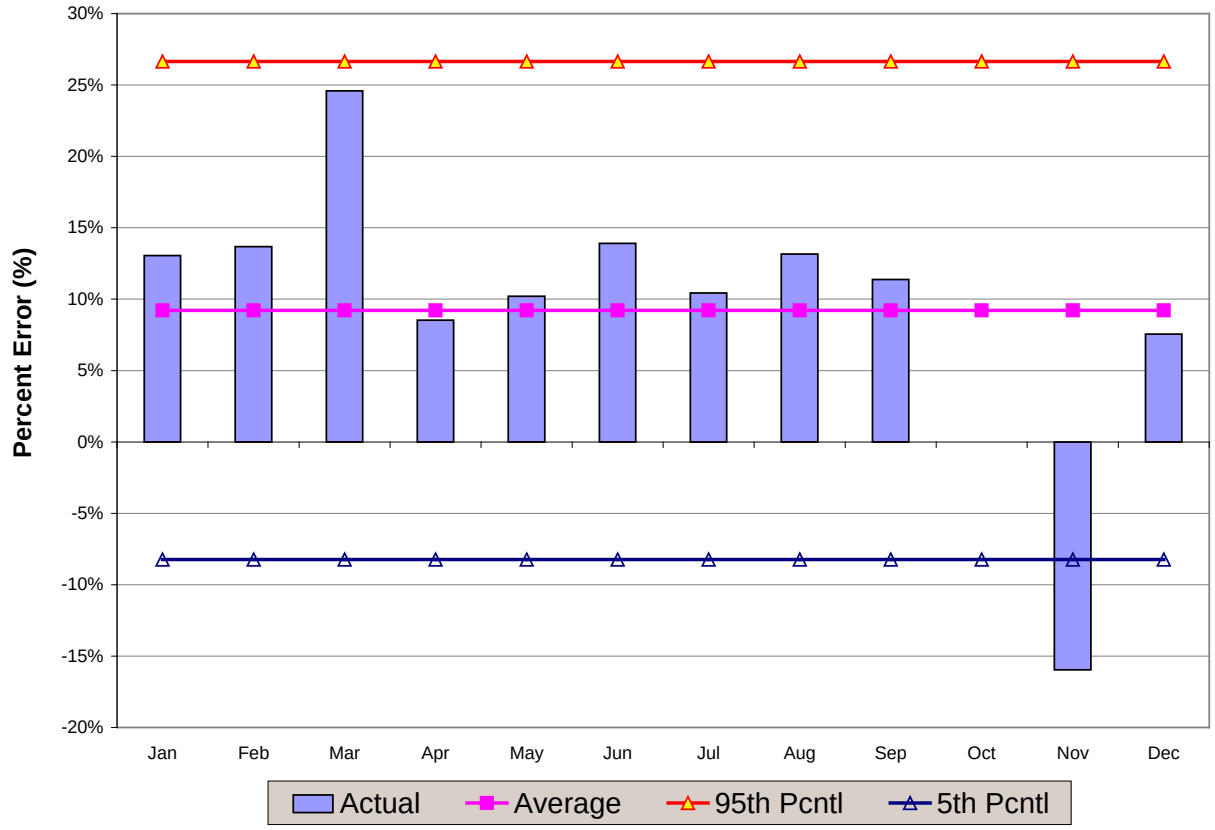
A. Mr. Thornton, the Company's load research witness, provided a table[2] comparing estimates of monthly billed energy to actual billed energy for the base year in this rate case, January through December 2008. A version of this table is provided as Exhibit 9.3 and computes the percentage difference between the two values, positive numbers reflecting over-estimates. Note that, while many of the differences are within 10 percent, many are not, and there is considerable volatility with respect to the differences. Based on these twelve observations, it is possible to construct a confidence interval of the error of any estimate of billed sales resulting from the load research data. For the irrigation class the analysis focuses on the predominant irrigation months of May through September only. Figures 6 through 9 depict the monthly percentage error in the estimated billed energy over January through December 2008, the average percent error over the relevant months, and the 90 percent confidence interval of the percentage error. The confidence interval is depicted using lines to represent the bounds at 5 percent and 95 percent. Accordingly, the two lines convey the range of error that could be expected for 90 percent of load estimates.

[2] Direct testimony of Scott D. Thornton, Exhibit RMP-SDT-1.

Figure 6: Accuracy of Energy Estimate from Load Research – Residential (Schedule 1)



212 **Figure 7: Accuracy of Energy Estimate from Load Research – Commercial (Schedule 6)**



213

Figure 8: Accuracy of Energy Estimate from Load Research – Small Commercial (Schedule 23)

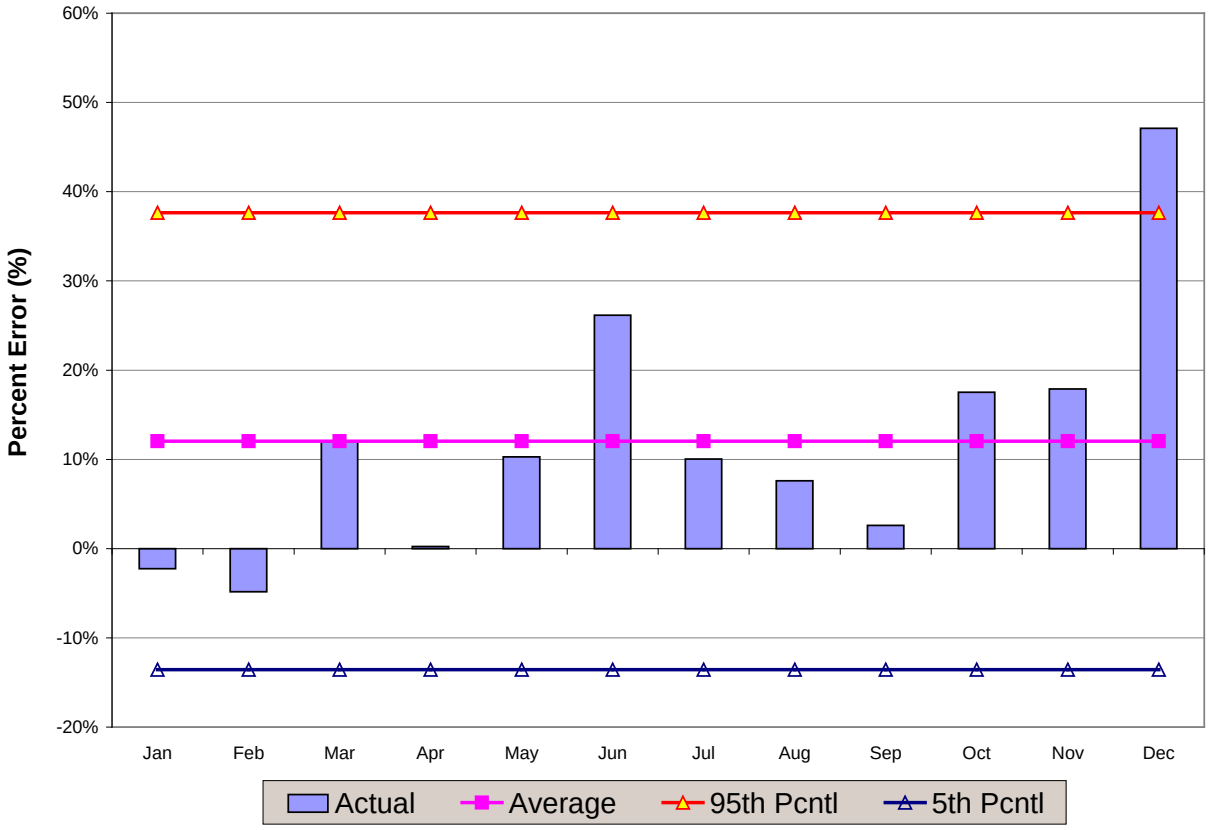
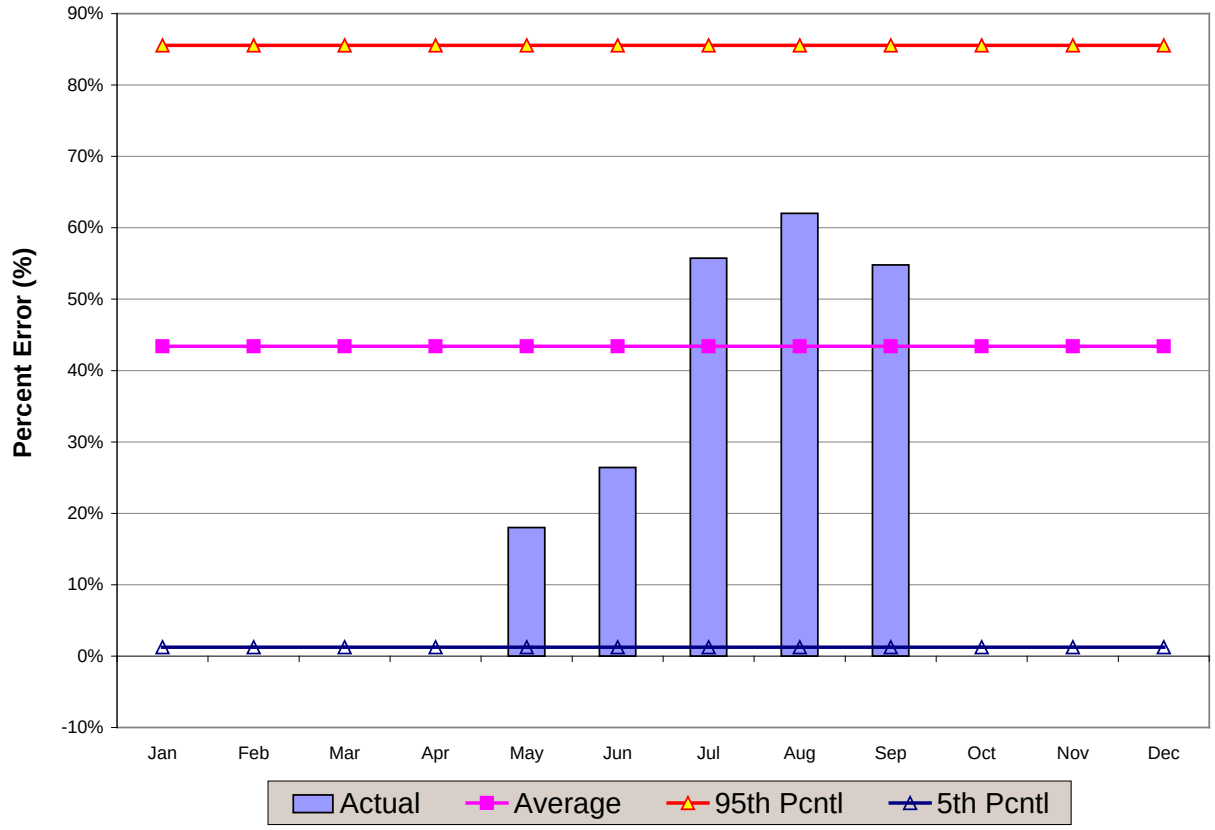


Figure 9: Accuracy of Energy Estimate from Load Research – Irrigation (Schedule 10)



Q. How reliable are these estimates given that the number of observations used is so small, particularly for the irrigation class?

A. The rule of thumb is that 30 observations are preferred when constructing inferences from a dataset. However, as described in a document entitled "Load Research Manual", published by the Association of Edison Illuminating Companies[3], and standard statistics textbooks, a small sample inference can be made using the *t* distribution, which is the basis of the confidence intervals shown above.

Q. What conclusions do you draw from these figures?

[3] "Load Research Manual, 2nd Edition". Association of Edison Illuminating Companies, Load Research Committee. 2001.

A. The 90 percent confidence interval of the error in the Company's estimates of billed energy resulting from the load samples and the Company's estimation process do not meet the standard of being within 10 percent of actual values for any of the rate classes for which load research is used to develop class demands. One would expect that over several observations, the errors of the estimates would average close to 0 percent, setting aside the irrigation class, for which Mr. Thornton explains in his testimony the Company has purposely over-sampled regularly irrigating customers. In addition, based on the PURPA standard, the width of the confidence intervals should be approximately 20 percent.

Q. Is this poor performance of load research estimates isolated to the current case?

A. No. Exhibit 9.4 contains several charts similar to those shown in Figures 6 through 9 above that compare the monthly percent error in the load estimates for this rate case to the percent error in the load estimates from the last two rate cases. Recognizing that the load estimates reflect some of the same samples and some overlap in the base years, these comparisons demonstrate that the errors in load estimates over the succeeding rate cases have been similar. The poor performance of the Company's load research program appears to be a long-standing problem.

Q. Does the Company's methodology correct for this problem in an appropriate way?

A. No, I do not believe it does. The Company adjusts the resulting load profiles of each class by a constant percentage for each month so that the estimated total energy equals the forecast energy for the class. This does not assure that the class demands, which are the output of load research for cost of service purposes, are accurate. Granted, the accuracy of the directly estimated class energy (i.e., prior to this adjustment) also does not guarantee

similar accuracy of the class demand estimates, but it does provide a modicum of comfort in that regard. The fact that the load research results in inaccurate estimates of class energy is a symptom of a problem with the overall program that is not corrected by a simple adjustment.

Q. What is your recommendation to remedy this problem?

A. Potential remedies include adjusting the sample design to produce greater precision than reflected in the PURPA standard. For example, the criterion for the confidence interval upon which the sample size is based could be increased to 95 percent rather than the PURPA standard of 90 percent. This would presumably involve increasing the number of samples, all else equal, and should improve the resulting estimates somewhat. Another possible solution is to adjust the stratification process, either by increasing the number of strata or stratifying using a different variable, perhaps in addition to billed energy, the current stratification variable. Variables such as location within the service area, home age, housing density, seasonality of energy usage, and other factors might be considered as potential additional stratification variables. While many potential stratification variables are not knowable without great expense, it might be possible to develop proxy variables that would accomplish the goal of improving the representativeness of the samples. For example, certain portions of the service area may be known to comprise a larger or smaller proportion of new homes. Information in this regard could be used to create a binary variable with which to stratify customers. The Company's service area is unique in several regards, and the sampling plan might need to be made more complex to address that fact.

Q. Do you have any other recommendations?

A. Several years ago, a rate case involving the Company promulgated the formation of a Load Research Working Group to delve into the same or similar issues. While some progress appears to have been made with understanding these issues and moving toward solutions, more needs to be done in that regard in such an open, cooperative forum. I recommend re-convening that group to investigate the cause of the poor performance of the Company's load research program relative to the PURPA standard and develop solutions to produce more reliable load estimates for cost of service and related studies.

Q. Would any new information cause you to change your testimony on this subject matter?

A. That is possible. The Company may provide additional information about its class demand estimates used in the cost of service calculations that demonstrate greater reliability than these data. In particular pending discovery may reveal more clearly the basis of the data presented in Mr. Thornton's testimony.

Q. Does this complete your Testimony?

A. Yes.