BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the matter of Missouri Gas Energy's Purchased Gas Cost Adjustment tariff Revisions to be reviewed in its 2002-2003 Actual Cost Adjustment.	))))	Case No. GR-2003-0330 et al.

PRE-HEARING BRIEF OF MISSOURI GAS ENERGY

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I. Introduction

The ultimate issue in this case is whether Missouri Gas Energy ("MGE") acted within a range of prudent behavior in predicting a possible demand on its system and establishing a particular level of contract pipeline capacity to meet that possible demand. After three rounds of pre-filed testimony, the following points should be apparent:

- The Southern Star Central (SSC) pipeline contract is the cornerstone of the MGE capacity portfolio. The SSC renewal negotiation in 2001 included production area capacity, storage capacity and withdrawal quantity, market area capacity and service selection. It was a complex process conducted by experienced MGE gas supply personnel. Not only does this capacity represent 75% of the overall MGE portfolio, it also delivers gas to all three of the MGE regions, accesses three major natural gas supply basins and has the most flexible storage resources. The SSC renewal and consolidation considered and leveraged MGE's existing capacity assets and also resulted in a $3 million discount flowed through to ratepayers.

- One Staff member makes repeated claims that MGE's capacity planning was unreasonable and lacked documentation. She claims that led to MGE contracting for an excessive level of pipeline capacity. She did an analysis of her own that concluded MGE's capacity in the 2001/2002 ACA period and the 2002/2003 ACA period was in excess of what she predicted as appropriate for the 2005/2006 ACA period. She initially identified two capacity contracting decisions she claimed were imprudent. However, in the most recent filing, she now states that the capacity increase from the Pony Express contract was not imprudent. (Jenkins Sur., p. 6, lines 7-8) In other words, the Staff witness now apparently recognizes that the Pony Express contract, volumes and delivery flexibility were portfolio attributes that must be

considered in MGE's negotiation of the SSC contract renewal. This is only one of several inconsistencies in her position, though.

- MGE attached to the direct testimony of David Kirkland copies of *six* MGE Reliability Reports (Schedules DNK-2, 3, 4, 6, 7, and 8) that were filed with the Commission between 1996 and 2002. Each of these 100+ page documents discusses in detail MGE's planning methods, input data and results, its proposals to add or modify capacity, and provides historical and projected data and associated documentation. MGE typically used a ten-year planning horizon in these documents. These reports were prepared in accordance with an outline Staff, MGE and other parties agreed to in advance. Subsequent Staff reviews of these filed documents state unequivocally that MGE's planning methods are "adequate." (See, e.g., Kirkland Direct, Schedule DNK-2, pp. 000137-000141).

- Staff recognizes that reasonable management decisions about demand projection assumptions, i.e., weather can vary over a wide range from "quite lean" to "quite conservative." (Reed Reb., p. 9) No objective or independent evidence demonstrates that MGE acted outside a range of *reasonable* behavior in its contracting decisions or in its approach to estimating future demands that may be placed on its system by its customers in extremely cold conditions.

- Local gas distribution companies employ a wide range of approaches for demand estimation. There are no established rules, standards, or even guidelines in Missouri on how to estimate demand, or what time period to use as a planning horizon. The methods MGE relied upon are consistent with what others in the business have used and are reasonable.

- There was a limited amount of customer usage data available for MGE for this particular time period. In other words, there were no recent "design day" experiences to use as a basis for predicting future possible design days.

Staff, Concentric Energy Advisors ("CEA") and MGE used the same basic data as a starting point from which to extrapolate. Each employed different demand analysis methods to make projections from selected portions of the available data. The projections of MGE and CEA are higher than the result of Staff, but all are in the same general area. Differences in the results between Staff on the one hand, and MGE and CEA on the other, are mainly due to their respective selections of weather and usage data to project from and the assumed level of baseload usage.

- Despite the possible, but erroneous, implication that a demand analysis is all a gas utility needs to make contracting decisions, there are many other factors, variables, and constraints that have to be considered, and judgment has to be employed. Firm pipeline capacity is a scarce commodity and can only be acquired when it is available.

- Even though there are many different approaches in actual use, the Staff witness invented a unique demand forecasting approach that she holds up as the sole standard against which MGE should be measured and, in this case, penalized. This particular approach had not been invented at the time of the events she now criticizes. There is no indication her approach has been relied upon by anyone else in this field of endeavor, and it suffers from major flaws that directly affect the results.

- Staff used gas usage data from hundreds of *relatively warm* days in an attempt to predict customer usage on one extraordinarily *cold* day. That creates a problem identified by authorities in the field of statistical analysis. Another major flaw is Staff's assumed level of "baseload" -- the amount of gas typically used when furnaces of customers are *not* running. The Staff witness has taken inconsistent positions on this point over time, but settled on one for this case that assumes a level only half of what was actually experienced.

- When the Staff's equation was re-run to change only one major assumption – the Staff's use of hundreds of relatively warm days -- the result is not materially different from what MGE obtained originally, and what Mr. Reed of CEA obtained in his independent analysis designed to test the reasonableness of the approach MGE followed. The accuracy of Staff's approach was also tested by applying it to 12 actual cold temperature/high use days. Staff's method *under-predicted* the demand *actually* experienced on each day. Because of its flawed assumptions, Staff's approach has been demonstrated to be neither reasonable nor reliable and therefore should not be used as a standard for prudence review purposes.
- The Staff witness stresses that MGE had the same information she used, i.e., weather and usage data. While that is true, what MGE did not have at the time was the foreknowledge that the planning standard it would be held to in this case would be based on a model of her invention or that her fo5ecasting approach would be held above that of all others. This process of evaluating a company based on *ex post facto* standards is hindsight evaluation, which is not permitted in a prudence evaluation.
- The evidence shows MGE's actions were within the range of reasonable actions, as evidenced by what other companies do under similar circumstances.

This pre-hearing brief will explore each of these topics in more detail but it does not purport to discuss every topic raised in the prepared testimony. It intentionally avoids mention of any Highly Confidential numbers. Based just on what has been filed, though, it should be clear that the Staff has built its claim of imprudence on a very shaky foundation.

II. The Standard for Evaluation

How do you determine imprudence? Prudence is a concept that has certain well-established and generally accepted principles. Those legal principles must be followed by the Commission in order for its decision to withstand judicial review. MGE's witness John Reed reviewed the concepts in his direct testimony.

Origin and Aspects of the Prudence Standard

Mr. Reed explained that the concept of "prudence" in regard to a review of decisions made by regulated public utilities comes from a U.S. Supreme Court case in the early part of the last century, just after regulated public utilities had come into existence. In *Missouri ex rel. Southwestern Bell Telephone Co. v. Public Service Commission*, 262 US 276 (1923), Justice Brandeis explained that

> There should not be excluded from the finding of the [rate] base, investments which, under ordinary circumstances, would be deemed reasonable. The term is applied for the purpose of excluding what might be found to be dishonest or obviously wasteful or imprudent expenditures. Every investment may be assumed to have been made in the exercise of reasonable judgment, unless the contrary is shown.

From this, Mr. Reed explained, come two fundamental principles of ratemaking. The first is that only reasonable or prudent expenditures are to be included in a utility's rates. The second is that a utility's expenditures are presumed to be prudent until it can be demonstrated that the expenditures were imprudent through clear evidence of utility misconduct. (Reed Dir., p. 12)

Mr. Reed also explained that the concept of prudence has been studied by the National Association of Regulatory Utility Commissioners (NARUC) who have expressed it in terms of four principles for a utility commission to follow:

1) a presumption of prudence;

2) a rule of reasonableness under the circumstances;

3) a proscription against hindsight; and

4) a retrospective, factual inquiry.

The first principle means there is a presumption of prudence to the utility's actions. In other words, another party must come forward with evidence to show that a utility's conduct in a given situation was imprudent. This Commission has agreed with that, and applied that principle in several cases.[1] Generally, the Commission has adopted a "reasonable care" standard. (Reed Dir. p. 18) In ***In Re Union Electric Company***, 27 Mo.P.S.C. (N.S.) 183, 194 (1988), the Commission articulated the standard by saying:

> ... the company's conduct should be judged by asking whether the conduct was reasonable at the time, under all circumstances, considering that the company had to solve its problem prospectively rather than in reliance on hindsight. In effect, our responsibility is to determine how reasonable people would have performed the tasks that confronted the company.

The second principle requires that the action of the utility's management be evaluated in light of what was known, or reasonably knowable, at the time the decisions in question were made. As such, the Commission must evaluate whether the decisions were appropriate given the information available at the time. In other words, while the ***results*** of management conduct can be used to rebut a presumption of prudence, results of management conduct cannot be relied upon to determine whether that ***conduct*** was prudent. (Reed Dir., p. 14)

The third principle closely follows the second one. Since the utility's action must be judged based on the reasonableness of the circumstances that existed at the time,

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[1] "Utilities seeking a rate increase are not required to demonstrate in their cases-in-chief that all expenditures were prudent ... However, where some other participant in a proceeding creates serious doubt as to the prudence of an expenditure, then the applicant has the burden of dispelling these doubts and proving the questioned expenditure to have been prudent." ***In Re Union Electric Company***, 27 Mo.P.S.C. (N.S.) 183, 192 (1988).

using hindsight to evaluate a utility's actions will not result in a decision that will be approved by a reviewing court. To support this, Mr. Reed quoted from a presentation of the National Regulatory Research Institute that says the "prudence standard establishes the basis for evaluation in terms of 'bad decisions' rather than 'bad outcomes' (no 20/20 hindsight)," meaning that information available after a decision was made is irrelevant to the prudence evaluation. (Reed Dir., p. 15)

The last principle developed by NARUC is that a commission must develop a record of the facts – not opinions — at the time the utility's decision was made. This is the record that should be used to evaluate the utility's decision.

Prudence Applies to Decisions, Not Costs

Mr. Reed summarized these principles as essentially supporting two related themes:

1. The prudence standard applies to decisions, not to results; and
2. Costs cannot be imprudent, only actions.

Thus, the first theme distinguishes between actions and results. If management uses available information to make reasonable decisions within the then-current framework, the decision is prudent regardless of the outcome. The second theme follows the first in that it means costs are only "imprudent" if they arise out of imprudent management actions or decisions. (Reed Dir., p. 15)

It is also important to remember, Mr. Reed stressed, that there can be a broad range of reasonable and appropriate decisions in any given situation. (Reed Dir., p. 16) In addition, "in times of unprecedented occurrence, the range of reasonable behavior is typically broader due to the lack of experience with such situations and the ability to rely

on past practices to make informed decisions." (Id.) In other words, there is more than one appropriate response to a given problem and the range of reasonable conduct is wider during extraordinary situations. Further, it is important for any applicable minimum standards or level of behavior to be communicated to the utility in advance of the utility being judged by them. (Id.) Both of these principles play an important part in this case.

Missouri Natural Gas Prudence Decisions

The Commission issued a decision in 1995 in which it articulated the standard it seeks to apply in the type of case presented here. (Reed Dir., p. 19) Since it has already said how it would apply the standard in a case such as this, it would be informative to review exactly what the Commission said:

> The incurrence of expenditures or accrued liabilities on the part of local distribution companies in exchange for the physical delivery of natural gas results from action or inaction on the part of individuals in the employ of the local distribution company at some point in time. It appears to the Commission that it needs to clarify the parameters of gas cost prudence reviews. The Commission is of the opinion that a prudence review of this type must focus primarily on the cause(s) of the allegedly excessive gas costs. Put another way, the proponent of a gas cost adjustment must raise a serious doubt with the Commission as to the prudence of the decision (or failure to make a decision) that caused what the proponent views as excessive gas costs. The Commission is of the opinion that evidence relating to the decision-making process is relevant only to the extent that the existence of a prudent decision-making process may preclude the adjustment. ... ***The critical matter of proof is the prudence or imprudence of the decision from which the expenses result.*** (Emphasis supplied)

In Re Western Resources d/b/a Gas Service, 3 Mo.P.S.C.3d 480 at 489.

Therefore, throughout the deliberations in this case, the Commission must focus on the ***decisions*** that were made by MGE and what was known or reasonably knowable to MGE at the time the decisions were made. The Commission must also

consider that there are likely to be a ***range of decisions*** that can be made in any given situation and therefore only substantiated costs, if any, which would be associated with conduct below a minimally-acceptable level of conduct, should be considered for disallowance.

With that framework in mind as to how the evidence must be evaluated, we can make a preliminary analysis of the Staff's contention that MGE has surplus pipeline capacity. No capacity planning or design day forecasting standards have been adopted in Missouri. There is no statute, rule, or even a guideline prescribing a specific conduct for MGE that has allegedly been violated in this situation. There is no allegation in this case that any "accepted industry practice" has been violated, either. Therefore, Staff's claim that MGE has surplus capacity – i.e., more than necessary to meet an extreme level of demand on an extraordinarily cold day – is solely a matter of opinion of the Staff witness. It is premised on a mathematical approach Staff developed only for this case. That approach has never been subjected to any objective or critical analysis, much less approved or utilized by any recognized authority. There is no evidence that Staff's approach is reasonably relied upon by other experts in the same field. Nevertheless, Staff claims it is the only appropriate measuring stick.

III. Design Day Demand Forecasting In General

To properly evaluate the Staff's allegations about MGE's capacity planning and contract levels requires a clear understanding of several topics. One is how gas utilities typically go about the process of planning for the demand levels that customers could place on their distribution systems. That, in turn, can entail several other topics, including the use of statistical tools, weather and usage data to forecast possible

maximum levels of demand over a planning period. Another topic is how local gas distribution companies have to interact with interstate pipelines to reserve capacity on the pipelines in order to move the gas to meet the demands of customers. So it is necessary to develop an understanding of concepts such as "design day," "baseload demand," and "heatload demand."

What is a "design day"? In this context, it is the maximum demand that a natural gas utility is expected to experience under extreme conditions, which may or may not occur during any given year. (Reed Dir., p. 7) Visualize, if you will, three-inch banner headlines in the ***Kansas City Star*** that scream:

RECORD COLD GRIPS AREA

That is a "design day."

If there had been extremely cold weather in western Missouri in the past decade or so since MGE commenced operations in 1994, MGE would have data on exactly how much gas was used under those conditions and would presumably then have a good idea of the amount of gas its customers will consume under such extraordinary conditions. Fortunately for western Missouri, that did not happen. Unfortunately, though, that means that MGE has to come up with a way to approximate usage under extreme conditions if it should happen. That means using some sort of forecast or prediction.

Companies such as MGE have an obligation to ensure that natural gas is flowing to customers in a reliable manner on a day like those hypothetical headlines describe. To meet that task, they conduct a capacity planning process. A design day forecast is one tool and one part of the on-going capacity planning process that provides an

indication of the amount of pipeline capacity (and other supply resources such as storage) customers could use on an extremely cold day. (Reed Dir., p. 7) Once that level is estimated, the utility has to deal with potentially dozens of other entities to obtain the gas itself, usually from a long distance, and arrange for its transportation through the maze of pipelines. (Kirkland Dir., p.7-9) In particular, it needs to contractually reserve enough space on those pipelines to haul the appropriate amount of gas to where the customers are located.

Pipeline capacity is not necessarily available exactly when needed by a distribution company. For instance, MGE's primary pipeline service provider SSC (formerly known as Williams) has been booked solid for a long time. Due consideration also has to be given to many factors including economics, reliability, supply basin diversity, pipeline diversity, regulatory considerations and pipeline tariff requirements. Actual customer demand rarely mirrors forecasted demand. Pipeline capacity can only be acquired when it becomes available, and that can happen sporadically. (Id.) Planning under these conditions has been the general responsibility of local distribution companies since the Federal Energy Regulatory Commission ("FERC") unbundled the interstate pipelines in the early 1990's. (Reed Dir., p. 8)

Mr. Reed of CEA has experience with design day forecasts involving several gas companies over the last 25 years. He says there is no one correct way to forecast a design day demand. (Reed Dir., p. 23) That coincides with Staff's statement that, "There is no one 'reasonable method' used by all Missouri LDCs." (Reed Sur., p. 11, ftn. 18) He says that while details can vary, most such design day forecasts include:

- a design weather specification (i.e., how cold could it get?)

- a forecast of baseload demand (i.e., how much gas do customers normally use when it is warm outside?)
- a forecast of heatload demand (i.e., how much gas would customers use when all the furnaces are running?), and
- a comparison of the forecast design day demand over a period of time to the existing supply-side resources capable of delivering natural gas to the citygate, (i.e., is there enough capacity in the company's portfolio?). (Reed Dir., p. 23)

Determining Design Day Weather

There are two primary ways gas utilities seek to determine design day weather. One is called a "probabilistic" approach and the other the "coldest observed" approach. (Reed Dir., p. 26)

Staff used the latter, i.e., Staff utilized the coldest observed weather in Kansas City for the Kansas City and St. Joseph service regions. The coldest observed weather in Joplin was used for the Joplin region.

In its Reliability Report dated May 1, 1996, MGE utilized the coldest observed approach, i.e., MGE utilized the coldest observed weather in Kansas City for all three service regions. This approach was used by MGE until 2004.

For his independent design day analysis in this case, which he utilized to test the reasonableness of the result MGE obtained at the time, Mr. Reed used the probabilistic approach. The probabilistic approach determines design day weather on the statistical likelihood, or probability, of it being experienced. It is often characterized as a "1 in x number of years" probability. Most residents of mid-Missouri can relate to that, having

experienced a "1 in 500 year" flood on the Missouri River in the summer of 1993. That extreme weather conditions can occur, and result in utility company estimates of peak usage being met or exceeded, was demonstrated just last month when peak demands on the municipal electric system in Los Angeles exceeded design forecasts by about 20%.[2]

MGE primarily provides gas service in the Kansas City, St. Joseph and Joplin areas. As a test on the reasonableness of MGE's forecasts that have been called into question by Staff allegations, Mr. Reed set out to determine what the 1-in-100 year probability of an extremely cold temperature for Kansas City, St. Joseph and Joplin would be. He explained the process in detail on pages 27-28 of his direct testimony. This 1-in-100 year probability assumption is utilized as a standard approach elsewhere in the industry. (Reed Dir., p. 30)

The temperatures determined by this probabilistic method, expressed in terms of Heating Degree Days (HDDs), were 81.9 HDDs for Kansas City and St. Joseph and 76.3 HDDs for Joplin. HDDs are basically a measure of coldness relative to an assumed base temperature of 65 degrees Fahrenheit.[3] (Reed Dir., p. 26) So, in simple terms, the design day temperature for Kansas City and St. Joseph that Mr. Reed used would be approximately 17°F below zero and for Joplin, approximately 11°F below zero.

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[2] "Before this week, the utility's highest peak energy use was recorded at 5,661 megawatts. The heat wave created a demand of 6,165 megawatts -- shocking officials who predicted usage wouldn't top 6,100 megawatts for another four years." – "California heat wave death toll tops 130", CNN, July 28, 2006. <http://www.cnn.com/2006/US/07/28/heatwave.ap>

[3] Named for instrument maker Daniel Fahrenheit, who produced the first accurate thermometer in 1717 by successfully getting a very even bore in a glass tube. No one knows for sure why he calibrated it in a way that has water freezing at 32°F and boiling at 212°F.

The other primary method, coldest observed, looks back to the coldest temperature observed in a defined time period. (Reed Dir., p. 27) That approach assumes if a certain very cold temperature occurred in the past, it could occur again.

In its 1996 Reliability Report (filed approximately two years after it commenced operations), MGE states that it used a temperature of -18° F for all three regions for ten-year planning purposes, noting that temperature had been actually experienced in December of 1989 when Western Resources owned the system. (Schedule DNK-2, p. 000007)

Staff also used the "coldest observed" approach for its analysis in this case. Staff utilized 81.5 HDDs for Kansas City/St. Joseph and 72.1 for Joplin. These represent the coldest observed temperatures as recorded by NOAA and Accuweather. Note that Staff and Mr. Reed are less than one-half of one degree apart in their assumptions for cold temperatures in Kansas City and St. Joseph. The Kansas City and St. Joseph service areas represent the overwhelming majority of total MGE system usage. There is a much bigger difference between Mr. Reed and Staff when it comes to the pertinent Joplin figure: 76.3 versus 72.1 HDDs.

Mr. Reed criticizes Staff's selection of the HDD data it used for Joplin. The criticism is *not* that Staff used the coldest observed approach but that the *data* Staff uses results in *substantially different* degrees of reliability assurance for the different MGE service regions. Mr. Reed points out that Staff's selection of 81.5 HDDs for Kansas City/St. Joseph represents a 1-in-87 year statistical probability of occurrence, while its use of 72.1 HDDs for Joplin represents only a 1-in-25 year probability. So while the numbers Staff used may reflect temperatures that actually occurred in the last

30 or 40 years, they *do not* reflect the same level of probability of extreme cold occurring in each region in the future. Mr. Reed maintains that the coldest observed approach – while appropriate in certain circumstances -- should not be used for two separate service territories if the design day weather is not consistent because then the *level of protection* for the customers between the regions is not consistent. (Reed Dir., p. 29)

Staff apparently failed to take equivalent levels of protection into consideration in selecting its data. At this time, Staff has not changed its approach or offered an explanation as to why, under Staff's approach, the residents of the Joplin area are entitled to significantly less protection against the risk of extreme cold than those in Kansas City and St. Joseph.

Baseload Demand

The total usage level experienced by a gas utility can be thought of as having two components. One is a fairly constant level induced by customers that is generally not responsive to changes in ambient temperature. It is called *baseload* demand. The other is responsive to changes in weather and is called *heatload* demand. (Reed Dir., p. 32)

When it comes to forecasting design day demand, it is important to identify the baseload since, by its nature, it will not change with increasingly colder temperatures. By removing the baseload component from total demand, the relationship between heatload and temperature (as measured in HDDs) can be used to estimate the weather sensitive portion of the *forecasted* design day demand. (Reed Dir., p. 33)

The primary approach used by gas utilities to calculate baseload is to utilize the actual demand experienced during the summer. There are few, if any, HDDs experienced during the summer since ambient temperatures are not typically below 65° F, so the actual demand reflects the absence of any natural gas used for heating purposes. (Id.)

In its 1996 Reliability Report, MGE used average summer load as being representative of baseload. (Reed Sur., p. 21) It used that same approach in the ten year forecasts included in the Reliability Reports submitted in 1997, 1998 and 2000. Staff reviewed those reports and specifically deemed MGE's analysis to be "adequate." In addition, Ms. Jenkins, in an email sent to MGE in 2002, stated that Staff would accept a two-year average of summer load data to calculate baseload. (Reed Sur., p. 22-23) Mr. Reed says that what MGE did was similar to how he calculated baseload for his independent approach -- using the average of the July and August demands actually experienced on MGE's system. (Reed Dir., p. 33; Sur., p. 21) MGE's approach is consistent with industry practices and generally-accepted definitions. (Reed Reb., p. 18; Reed Sur., p. 21)

In contrast, the numbers Staff utilized for baseload in this proceeding appear to have come from Munchkin Land. The numbers Staff assumes for baseload are about *half* of that normally experienced on MGE's system. (Reed Dir., p. 34) Mr. Reed says Staff's approach reflects this same problem in all three of the MGE service territories. He says there is no justification for Staff's use of these aberrant numbers. (Id.) Interestingly, though, the numbers that would have resulted from the two-year average

sanctioned by Ms. Jenkins in her 2002 email would be similar to that used by MGE, Mr. Reed, and apparently most of the industry. (Reed Sur., p. 23-24)

Heatload Demand Forecast

As noted earlier, heatload demand is the winter weather-sensitive portion of the total. Since natural gas is typically used for heating (as opposed to cooling), heatload demand tends to increase as HDDs increase but the exact relationship may not be linear. HDDs, by definition, increase as the ambient temperature decreases. It is the relationship between heatload and HDDs that is used to forecast demand out into the realm of extraordinary cold temperatures. (Reed Dir., p. 35) Once the heatload demand factor is established, it is multiplied by the design day weather and that result is added to baseload to determine the design day demand forecast. (Id.)

There are many ways in which a heatload factor can be calculated. Staff and Mr. Reed (and MGE) agree that a regression equation can be used for this purpose. (Reed Dir., p. 35) For those liberal arts majors who may be reading this, regression analysis attempts to model the relationship between two or more variables by fitting a regression equation to observed data. A good regression equation can be used to predict the response variable. In almost all applications of regression, the regression equation is only an approximation to the true functional relationship between the variables of interest. These functional relationships are often based on physical,

chemical, or other engineering or scientific theory, that is, knowledge of the underlying mechanism.[4]

Having mathematically adept people say you can use a regression equation to predict heatload on a natural gas distribution system is apparently a lot like the rest of us saying you can use a sausage grinder to make sausage. Yes, it will work. But if you want a quality result, take caution as to what you put into it. And it brings to mind the famous phrase that has been applied to computing since the early 1960's: "Garbage in, garbage out." Often abbreviated as "GIGO," this axiom means that if invalid data is entered into a system, the resulting output will also be invalid. Stated another way, a regression analysis is only as good as the data on which it is based.[5]

IV. The Big Differences

How Did We Get Here?

At a basic level, MGE, Staff and Mr. Reed of CEA each plug their respective facts and assumptions about temperatures and usage into equations they each believe will reasonably predict future customer usage on the MGE distribution system under extraordinary temperature conditions. So, reduced to the simplest terms, this controversy is about *dueling forecasts* that produced different results. Why do they produce different results? They each used different inputs and different approaches.

Was each input reasonable, or could some possibly be "garbage"?

To test the reasonableness of MGE's forecast, CEA prepared a design day demand analysis independent of those done by MGE or Staff. CEA's considered the

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[4] Douglas C. Montgomery, Elizabeth A. Peck and G. Geoffrey Vining, Introduction to Linear Regression Analysis, p. 4

[5] Ibid p. 7

same demand and HDD data that was available at the time of the 2001/2002 and 2002/2003 ACA periods. CEA, however, utilized an approach that was different from either MGE or Staff. It used a method that was used in MGE's most recent reliability report and incorporated many elements that Staff had previously criticized MGE for not including in its earlier Reliability Reports. (Reed Dir., p. 24) So from Staff's perspective, CEA's approach and results ought to be *superior* to what MGE used in the past. On a combined basis for all three service regions, the results of CEA's analysis are not materially different from what MGE obtained in its 2001 Reliability Report. (Reed Dir., p. 45; Sch. JJR-8)

The prepared testimony highlights two major differences in the underlying assumptions and data used by Staff in its approach. Those are evidently responsible for the controversy in this case. In simple terms, the equation for design day demand only has four variables or inputs. (Reed Dir., p. 23) The numerical value of two of the variables Staff used – those for heatload factor and baseload demand – produce a lower end result or prediction than either MGE or Mr. Reed obtained. That difference apparently led Staff to believe that MGE does not need the level of contracted pipeline capacity that it has. That, in turn, translated into a Staff recommendation for a disallowance for some of MGE's existing pipeline capacity as being unneeded, or excessive, because it was above the level the Staff calculation produced. That then drove Staff to claim that MGE acted imprudently in making contracting decisions that resulted in the capacity level MGE has.

The annual cost of that capacity in each of the two ACA periods covered in this case is a little more than $2 million – so the total amount of the recommended

disallowance, covering 24 months -- is more than $4 million. As expected, MGE has resisted the allegation that it was imprudent in its planning and decision-making to the tune of $4 million. But when you trace all this back to the source, the root cause of this controversy is the validity -- or reasonableness – of two Staff assumptions used in its calculation. In the world of dueling forecasts, the devil is in the details. We will now examine them in more detail.

Baseload Demand Assumption

Baseload demand is one of the four factors in the equation that produces a numerical value for design day demand. (Reed Dir., p. 23) The different numbers used by Staff, MGE and Mr. Reed as an assumed level of baseload demand are shown in a table on Schedule JJR-15 attached to Mr. Reed's surrebuttal testimony. It is readily apparent that the numbers used by Ms. Jenkins are roughly half those used by everyone else. (Reed Sur., p. 22-25) And that also applies to the numbers that Ms. Jenkins *could* have used had she utilized a "two-year average of summer usage" approach that she sanctioned back in 2002, but did not in fact use in this case. (Id.) Please note that the date on her email message is almost one year after the 2001/2002 Reliability Report was filed and the SSC contract was signed.

MGE used the simple average of July and August demand data as being representative of baseload. (Reed Reb., p. 17) This approach was first reflected in the 1996 Reliability Report MGE filed with the Commission. (Reed Sur., p. 21) This approach is consistent with definitions of baseload relied upon by many others in the

industry, including the American Gas Association[6] and the New York Public Service Commission. (Reed Dir., p. 33; Reb., p. 18; Sur., p. 3)

Mr. Reed identified a problem with Staff's baseload numbers by pointing out that they "are inconsistent with reality." (Reed Dir., p. 34) Although Ms. Jenkins apparently subscribes to the general notion that baseload does not change with weather, she also curiously suggests that due to "customer habits," baseload could be different for summer and winter. (Jenkins Dir., p. 19-20; Reed Reb., p. 17) However, Ms. Jenkins has provided absolutely no support for this contention.

MGE used the same method of baseload calculation for its forecasts contained in the Reliability Reports that MGE filed in 1996, 1997, and 1998. (Reed Reb., p. 18; Sur., p. 3) Staff reviewed those reports and filed documents with the Commission that said MGE's approach to projecting design day demand was "adequate." In particular, Staff did not raise any concern about MGE's baseload calculations. (Id.) Therefore, the regulatory "feedback" MGE got from the Staff over that period was that its planning methods were "adequate." (Reed Sur., p. 3-4)

So in one corner we have MGE using an industry-wide approach to baseload demand that has previously been reviewed by Staff and found to be adequate, and in the other corner we have Ms. Jenkins with her unproven and unsupported assertions about "customer habits" and her numbers that are about half of the level of the actual observed non-heating summer load based on MGE data, and that are also at odds with an approach she sanctioned for MGE specifically in 2002.

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[6] "Residential non-heating use of gas is also known as baseload use. This use is typically not very weather sensitive. The primary residential baseload use is for water heating, which accounts for about 86 percent of non-heating demand, based on national averages." American Gas Association, PATTERNS IN RESIDENTIAL NATURAL GAS CONSUMPTION, 1997-2001, June 16, 2003, p. 5.

Development of a Heatload Factor

Heatload factor is another one of the four factors in the equation that produces design day demand. (Reed Dir., p. 23) Ms. Jenkins, Mr. Reed of CEA, and MGE all used different approaches. MGE used an approach involving recent observations of actual temperatures and usage. (See, e.g., DNK-9, p. 000005) Staff and CEA used regression analyses.

Ms. Jenkins criticizes Mr. Reed for *not using enough* data to develop an appropriate heatload factor for a design day. (Jenkins Reb., p. 8, 18) Mr. Reed criticizes Ms. Jenkins for using *too much irrelevant* data for that purpose. (Reed Dir., p. 37-42) So we also have a difference of opinion on whether more irrelevant data is better in this situation.

Staff used demand data from all 151 winter days in each of four calendar years, producing some 604 data points. The 12 data points Mr. Reed used in his analysis came from those used by Staff, so he did not use *different* underlying data. He just selected certain data points to use from the universe of those available.

Mr. Reed says he selected the data points he used because input data that is to be used in a regression equation should be very carefully selected so they are "representative" of the data to be forecasted. (Reed Dir., p. 37) Natural gas demand on any given day is influenced by a wide range of variables, and can even vary on different days with the same HDD values. (Reed Reb., p. 28-29)

The goal of the regression equation in this instance is to calculate a heatload factor associated with design day demand, which means demand on a very cold day. Staff improperly defined the goal (and therefore missed the point) as estimating *winter*

usage that could then be applied to design day weather. Ms. Jenkins used data from every winter day in the erroneous belief that the heatload demand per *average* winter day would be representative of the heatload factor on a *very cold* winter day. (Reed Reb., p. 24) So she utilized a lot of data that, while accurate, ultimately was irrelevant and misleading in terms of showing a correlation with what she sought to predict. When MGE is planning a capacity portfolio, it is not trying to be at the "average"; rather, it is attempting to manage at the extreme end. Therefore, the approach used by Ms. Jenkins which utilizes *all* the winter days will produce an estimate not only based on that data set but also *reflective* of that data set. In other words, the demand estimate developed by Ms. Jenkins will produce an averaged demand based on all the winter data. Both MGE and CEA, however, utilized a subset of data that is more reflective of demand under extreme conditions.

Mr. Reed points out that from a statistical perspective, if you include extraneous input data such as the Staff did, the result produced by the regression equation will not be as accurate. A regression equation will perform best within the bounds of the data utilized to develop the equation. (Reed Reb., p. 26) Mr. Reed relies on several authorities in the field of statistics to support this position. He cites from a statistics textbook used by Penn State University (Reed Dir., p. 38) and two textbooks dealing with regression equations. (Reed Reb., p. 26) These hold that the further the x-value (the point sought to be predicted) is from the center (mean) of the data, the more variable the estimate from the regression will be; meaning the more likely it will be that errors will result. (Id.)

To graphically depict the difference between his data selection and that used by Staff, he plotted all the points. Take a look at Schedule JJR-9 attached to his rebuttal testimony. This shows the underlying data correlating gas usage with HDDs.

Schedule JJR-9 also clearly shows that the statistical mean of Staff's data points (the vertical line called "Staff mean") is much farther away from the x-value (represented by the oval in the upper right) than the mean of his data points (vertical line called "CEA Mean"). According to the cited authorities on statistics, this results in Staff's data being more prone to error when used to predict the x-value; and conversely, Mr. Reed's data will be less susceptible to error. From a lay perspective, it appears that regression equations are like shooting a gun or an arrow; the farther you stand from the target (in terms of your data selection), the harder it is to hit the bull's-eye.

Even though she acknowledges that one must make a decision about the amount of data to include, Ms. Jenkins criticizes Mr. Reed's data selection because it "disregards usage on many high usage days." (Jenkins Reb., p. 18) Taking the cited authorities on statistics into account, though, it appears Ms. Jenkins' indictment of Mr. Reed's technique really just ends up spotlighting an error in her judgment. She has confused *available* data with *appropriate* data. (Reed Sur., p. 26) Her inclusion of so much data from relatively warm days shoves the mean of her data set farther from the x-value. That results in a downward bias. (Reed Sur., p. 33) It is undeniable that approximately 69% of the data she relies upon are from days where the average temperature *was not even below freezing.* (Reed Sur., p. 26-27)

What was the objective here? Oh, yes – to predict customer usage at an extraordinarily *cold* time; at the extreme end of cold weather data. So, in simple terms, she has muddied up the result of her analysis by including a lot of data that are not representative of high usage on very cold days. She simply committed a judgment error in choosing the data set and now refuses to recognize that. Mr. Reed highlighted this judgment error in an analogy: She set out to forecast the rate of car accidents per *teenage* driver, but she used a data set that included *all* drivers instead of just *teenage* drivers. (Reed Dir., p. 39)

Abstract mathematics is one thing but applying it to the real world is another. And that can demonstrate the potential for serious consequences. Mr. Reed drives that point home by "back casting" the Staff's regression. In other words, he used Staff's approach on *previously experienced situations* in order to test its accuracy in predicting the future. (Reed Reb., p. 27-28; Sch. JJR-10) He documents how Ms. Jenkins' approach would have *under-predicted* the actual demand *on all 12 historical cold days* with high usage he utilized in his approach. These were the three highest demand days that were also in the top ten coldest days over the winters of 1997/1998 through 2000/2001. Even after adding in Staff's proposed reserve margin, Ms. Jenkins' regression equation would have under-predicted demand on *5 of the 12* observations by a *significant margin*. At one extreme, the under-prediction in terms of MMBtus is even larger than the amount on which she bases her proposed disallowance. (Reed Reb., p. 27)

The significance of this back-casting test is that it shows her forecast *under-performed* under actual conditions even on days that were not close to design day

conditions. It is the flaw in her data selection that introduces error, as noted by the authorities on statistics. (Reed Reb., p. 28) Put another way, if Ms. Jenkins had been William Tell, and her regression equation were the equivalent of his bow and arrow, she would not have hit the apple even when aiming directly at it.

Mr. Reed's criticism of her approach is also validated by similar comments appearing in material from other Missouri LDCs – material that supposedly was reviewed by Ms. Jenkins -- and comments on design day planning by another gas utility in another state. (Reed Sur., p. 27-28) They all indicate the data used in a regression designed for this purpose need to reflect usage on *cold* days in order to be significant for forecasting purposes. So from the evidence, Mr. Reed is on a much more reasonable and reliable foundation for his data selection based on (a) the science of statistics and, (b) his reliance on methods generally utilized by others in the same field.

As yet, another test of the reasonableness and reliability of Staff's data set, Mr. Reed selected a smaller portion of the totality of data Ms. Jenkins used by limiting his subset to days of 35 HDD or greater (meaning days where it was 30° F or colder). When the Staff equation for the Kansas City region is re-run just with that more selective and appropriate data – and changing nothing else -- the Staff's forecast result increases by some 25,000 MMBtus. That represents a significant chunk (close to half) of the theoretical basis for Staff's recommended disallowance. And it significantly narrows the gaps between the dueling forecasts. The exact HC numbers on this topic are shown on page 33 of Mr. Reed's surrebuttal.

MGE inquired about whether there was any authoritative support for Ms. Jenkins' data selection technique. The response received was that "Ms. Jenkins relies on her education and training related to statistical analysis." (Reed Sur., p. 15)

Ms. Jenkins unwittingly gives yet another demonstration of her lack of statistical acumen in selecting a peak HDD for the Joplin region. She touts her number of 70.2 HDD as producing a "99% confidence interval." (Jenkins Reb., p. 10) Mr. Reed subjected that claim to further statistical scrutiny. He demonstrates that she wrongly assumed the distribution of the data set she used was normal. As graphically depicted on Schedule JJR-14, the data set she used is not normally distributed. Specifically, he demonstrates that 70.2 HDD is not representative of a 99% confidence interval as she claims. In reality, he says, the Staff number for the Joplin region is closer to a 1-in-20 probability rather than 1-in-100 as reflected in her claim of a 99 percent confidence interval. In fact, the Staff HDD level that purports to represent a 99% confidence interval has been exceeded twice in the 40-year period used by Staff. (Reed Sur., p. 19-20) (Id.) Again, Staff has not explained why the customers in the Joplin region would be entitled to less protection against weather extremes than those in Kansas City and St. Joseph.

V. Evaluation of Expert Testimony

In ***State Board of Registration for Healing Arts v. McDonagh***, *123 S.W.3d 146, 154-55 (Mo. banc 2003)*, the Missouri Supreme Court ruled that the standards set out in *section 490.065* RSMo apply to the admission of expert testimony in contested case administrative proceedings. In determining whether a witness is an expert under *section 490.065.1*, the fact finder looks to whether he or she possesses a "peculiar

knowledge, wisdom or skill regarding the subject of inquiry, acquired by study, investigation, observation, practice, or experience." *Id.* Moreover, witness credibility is a matter for the fact finder, "which is free to believe none, part, or all of the testimony."

Subsection 3 of 490.065 states that "The facts or data in a particular case upon which an expert bases an opinion or inference may be those perceived by or made known to him at or before the hearing and must be of a type reasonably relied upon by experts in the field in forming opinions or inferences upon the subject ***and must be otherwise reasonably reliable***." [Emphasis added] The fact finder in this case – the Commission – should focus on this statutory provision in evaluating the credibility of the opinion of Staff's expert in this case and, in particular, the reasonableness and reliability of the facts or data upon which her opinion is based. Indeed, ***McDonagh*** states that the fact finder "must also independently assess their reliability."

Serious doubt has been presented concerning the quality of the facts and data relied upon by the Staff witness and whether they stand up to the tests of being "of a type reasonably relied upon by experts in the field" and "otherwise reasonably reliable." This pre-hearing brief has already highlighted instances where critical facts or data relied upon by Staff are not reasonably reliable and are not relied upon by other experts in the field. In brief:

- Her claim of a 99% confidence level (i.e., a 1-in-100 year event) for her Joplin data turns out, in reality, to be significantly less – about a 1-in-20 year event.

- Her determination of a level of baseload demand is contrary to widely-accepted definitions utilized in the field of design day demand prediction, and it produces illogical results that directly conflict with real-world observations.

- There is no evidence that her technique for selection of usage and weather data for use in her regression equation (i.e., throw everything into the pot) is of a type reasonably relied upon by experts in that field. Instead, MGE has demonstrated that other gas companies are much more selective in choosing data to reflect usage per HDD.

- Her lack of selectivity in data selection for inputs to the regression equation she used has been demonstrated to suffer from a statistical bias problem that experts in the field have identified and about which they have published cautions.

- When her approach is back-cast onto recent actual situations, it significantly under-predicts the demand level that was actually experienced on MGE's system.

VI. Capacity Decisions and Decision-Making

As indicated earlier, a prudence review of this type properly focuses on decisions. The question is whether "the conduct was reasonable at the time, under all circumstances, considering that the company had to solve its problem prospectively rather than in reliance on hindsight." ***In Re Union Electric Company***, *supra*.

The origins of this case can be found in the Staff memos filed in the ACA cases established by the Commission for review of the ACA periods of July 1, 2001 to June 30, 2002 (Case No. GR-2002-0348; memo filed Dec. 19, 2003; Schedule JJR-1) and July 1, 2002 to June 30, 2003 (Case No. GR-2003-0330; memo filed Dec. 29, 2004; Schedule JJR-2). Therefore, the time period under review in this case is July 1, 2001 to June 30, 2003.

Among numerous subjects analyzed and evaluated in each of the Staff ACA memos for those periods, there is one part that says "because of inadequate peak day

analysis, the Company's estimates of peak day usage are not an appropriate basis to use in making decisions regarding contract renewal. However, the Company was making contract decisions impacting customer bills based on this inadequate analysis." (Sch. JJR-1, p. 11 of 16) The Staff memo then proceeds to mention immediately two specific contracting decisions made by MGE. (Id.) Ms. Jenkins also identified these two specific capacity decisions in her direct testimony. One is the purchase of incremental capacity on the Pony Express (f/k/a KN Interstate) pipeline and the other is a renewal and consolidation of MGE's capacity on SSC that did not change MGE's capacity level on that pipeline, but did achieve other benefits and produce a discount flowed through to the customers.[7] (Jenkins Dir., p. 8, 29-30; Reed Reb., p. 4-6)

Even though the Pony Express capacity addition was listed just below the heading of "Imprudent Decision" in her direct testimony (p. 29), we are told in her surrebuttal (p. 6, lines 7-8) that "Staff does not state that the [Pony Express] decision was imprudent." It is expressed as a "double negative" but the sentence seems to be acknowledgement that Staff believes MGE's decision to increase capacity on Pony Express was prudent (or at least "not imprudent").

A substantial portion of the prepared testimony in this case is devoted to the first part of Staff's claim that MGE's predictions are not an appropriate basis to use in making contract decisions. That testimony, however, has instead revealed that Staff's estimates are the ones that actually suffer from serious judgment problems and deviation from reasonable industry practices. That same evidence also demonstrates that Staff's estimates cannot reliably be used as a measuring stick. Attention, however,

[7] It should be noted that the amount of incremental capacity actually added on Pony Express is less than a third of the amount claimed by Staff here as "excessive." No incremental capacity was added by the Southern Star decision in early 2001.

also must be devoted to the decision and contracting process Staff criticizes. But before that is explored, there are two threshold questions about the contracting decisions[8] discussed by Staff that should be addressed.

The first is whether the decisions were really based on the forecasts that Ms. Jenkins claims. She ties the decisions in her direct testimony to the forecasts presented in the 2001/2002 and 2002/2003 Reliability Reports. Mr. Kirkland refutes that claim, pointing out that the decisions she targets would have relied on forecasts in existence in 1996 with regard to Pony Express and early 2001 with regard to SSC. (Kirkland Reb., p. 8)

The other threshold question is when the capacity decisions were actually made. The evidence clearly shows that *neither* decision was made during the ACA periods under review in this case, and therefore are outside the scope of this case.[9] They both predate July 1, 2001. In other words, there were *no capacity decisions* made by MGE in the July 1, 2001 to June 30, 2003 time period under review in this case to which Staff can attach a claim of imprudence. (Kirkland Reb., p. 3-6)

Prudence reviews examine decisions based on the information available at the time the decisions were made. MGE has provided the Commission with an overview of

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[8] Since October 2003, and throughout this case until her surrebuttal appeared, MGE had the impression from Staff testimony and its responses to data requests that Staff was challenging the prudence of both the Pony Express and SSC contract decisions. Staff has now apparently dropped any prudence challenge to the Pony Express decision. At this time, MGE cannot be certain of that, so for purposes of this brief, it will continue to discuss both of them since they are somewhat related.

[9] All MGE pipeline contracts are provided to Staff in the context of ACA filings. The 1996 decision and contract regarding Pony Express was reviewed by Staff in the July 1, 1997-June 30, 1998 ACA period, Case No. GR-98-167. The Southern Star consolidation contract signed 6/15/2001 was supplied to Staff on July 20, 2001 in response to Staff's data request number 6, and therefore available for review by Staff in the July 1, 2000 through June 30, 2001 ACA period, which was Case No. GR-2001-382. All contested issues (except Kansas Pipeline issues which were bifurcated) in those cases were tried in 2003 and submitted to the Commission for decision in February 2004.

the capacity planning and acquisition process in general (Kirkland Dir., p. 7-9) and on MGE in particular. (Id. 10-20) All of the Reliability Reports containing the details of the process have been submitted with the direct testimony. So just about everything MGE knew or relied upon has been presented for review but the Staff has not demonstrated that anything MGE did was out of the realm of reasonableness based on the information available at the time.

In the past, MGE has made capacity adjustments both up and down on what is now known as Southern Star Central (SSC). This discussion also shows that the decision to add the Pony Express capacity was made in 1996, at least partly in order to increase MGE's pipeline supplier diversity. Pony Express also allowed MGE to access lower cost natural gas itself from the Rocky Mountain area.

The decision to consolidate several pre-existing SSC contracts without adding to the existing capacity level on SSC was made prior to June 1, 2001. (Kirkland Dir., p. 16-18) MGE knew at that time that additional capacity from Pony Express was coming on, so it did not have to add to the existing capacity on SSC. The timing of all this means MGE could have relied on *only* the information that was available prior to December 1996 for Pony Express and prior to June 2001 for Southern Star. (Reed Reb., p. 6)

What sort of information would have been available in 1996? The evidence shows that MGE filed a 135 page Reliability Report (Sch. DNK-2, p. 00001-000135) on May 28, 1996. This was pursuant to a prior Commission order to do so, and pursuant to an outline that had been agreed to by Staff and others in advance. (Sch. DNK-2, p. 000139) That report sets out and discusses in detail MGE's demand forecasting and

capacity planning process. Mr. Kirkland discusses that report and the accompanying Staff memorandum. (Kirkland Reb., p. 9-20)

The report specifically discusses "Identified Needs for Transportation or Storage Capacity." (Id., p. 000074) There is even the following information about projections of MGE system demand:

> Accurate projections of system demand are vital to ensuring that MGE can meet its sale obligations in a cost efficient and reliable manner. The Company's short- and long-term forecasts are the product of continuously collecting, analyzing, and modeling the best available weather, volume and customer data. As a result of these efforts, Missouri Gas Energy has been identified by its largest pipeline supplier as the benchmark by which other customers should set their forecasting standards. (Sch. DNK-2, p. 000122)

There can be no dispute that the Staff filed a "Recommendation" on June 28, 1996, in which it reported to the Commission on its examination and evaluation of the MGE report filed a month earlier. (Sch. DNK-2, p. 000137-000141) Eight different topics covered by the Reliability Report were each evaluated by Staff. Each was graded. (Sch. DNK-2, p. 000140) Each topic presented by MGE under the agreed outline received the following evaluation by Staff: "Adequate."

What were some of the topics reviewed by Staff? They sound eerily familiar:

- "I.A. Peak day projections. This information reviews the historic weather-induced peak day gas demand and the criteria utilized for estimating peak demand during the forecast period. Staff response: Adequate."

- "I. B. Annual Load Projections. This information reviews the historic gas purchase volumes and forecasted monthly gas load. Also covered is the volume variance expected for each month for weather induced variations. Staff response: Adequate."

- "I. C. Projected Supply/Transportation Requirements. This section

discusses overall expected demand by month for the forecast period. Staff response: Adequate."

- "II. A. Pipeline Transportation/Storage Capacity. This information reviews existing transportation and storage deliverability and any areas with identified additional capacity needs. Staff response: Adequate."

- "III. A. Discussion of Projected Demand and Supply Needs. Staff response: Adequate."

So simply by looking at that first Reliability Report and the Staff's evaluation of it, we obtain a *contemporaneous* evaluation by two outside parties of MGE's planning and decision-making process back in the 1996 time frame when MGE was deciding about the Pony Express capacity addition. MGE's largest pipeline suppler holds up MGE's forecasting at the time as "the benchmark" by which others should set their standards. The Staff was not as forthcoming with praise, but nevertheless gave MGE a passing grade on all topics. The significant fact, though, is that *the Staff reviewed the process in 1996, found it to be adequate,* and did not indicate the type of faults Ms. Jenkins now claims, by virtue of hindsight through the distorted lens of her flawed assumptions, were present.

This same report-filing and evaluation process was repeated in 1997 with another Reliability Report covering similar topics and containing an MGE forecast from 1997 through 2007/2008. (Kirkland Reb., p. 20; Sch. DNK-3, p. 000001-000127) Staff filed its report on May 30, 1997, reviewing MGE's report. (Sch. DNK-3, p. 000128 – 000132) MGE was again found by Staff to have performed all of the tasks assigned in an "adequate" manner. (Kirkland Reb., p. 21)

The same process occurred again in 1998 with another overall "adequate"

finding by Staff. (Kirkland Reb., p. 22-25) There was no indication that the Staff viewed MGE's capacity planning or decision-making process in the same light that Ms. Jenkins does now. In fact, in the 1998 memo, Staff even made the statement that "This additional capacity should cover MGE's projected design day through the 10 year period of 1998-2008." (Sch. DNK-4, p. 000137)

There was no Reliability Report required or filed for 1999. However, on August 1, 2000, Staff took it upon itself to file recommendations with the Commission regarding MGE capacity planning and decision-making in the context of the 1998-1999 ACA case, Case No. GR-99-304. (Sch. DNK 5, p. 000003-000005) Significantly, Lesa Jenkins' name appears as one of the authors of that memorandum and a paragraph on the first page of that August 1, 2000 memo reads as follows:

> In addition, Staff conducted a reliability analysis for the MGE distribution system including a review of MGE information regarding a) estimated peak day requirements and the capacity levels to meet those requirements, b) peak day reserve margin and the rationale for this reserve margin, and c) annual estimated demand. No concerns were noted at this time.

So here we have Ms. Jenkins on August 1, 2000, participating in a memorandum that specifically states the Staff had *no concerns* about MGE's capacity levels or the manner in which it estimated demands. By this time, MGE had submitted to the Staff and the Commission more than 400 pages of documentation on its capacity planning methods and decisions. MGE's predictions or methods did not undergo any significant changes between 1996 and 2004.

This memo with her name appears almost four years after MGE made the decision and signed the Pony Express contract (in November 1996) requiring the incremental capacity addition to take effect in October 2001. It is also just before

the time MGE started negotiations with SSC that lead to the consolidation (but not an increase in capacity) of the then-existing contracts of which Ms. Jenkins now complains and apparently concludes there is substantial excess capacity. If this were a movie, dramatic music would be playing in the background right now.

So how do the Staff's allegations of lack of documentation and inappropriate planning fit into the standards for a prudence review that are recognized by the Commission? They don't. The decision to acquire pipeline capacity is one of the most fundamental responsibilities of a company like MGE and has been since the early 1990s when FERC unbundled the interstate pipelines. The process to analyze, negotiate, construct and put into place pipeline facilities is complex and has a long lead time. (Reed Reb., p. 11) In 1996, 1997, 1998, and 2000, Staff provided feedback to MGE that its capacity planning and acquisition was being done in an "adequate" manner and that there were "no concerns." So as Mr. Reed and Mr. Kirkland both note, MGE not only had commercial confidence in its Southern Star and Pony Express decisions, but also regulatory affirmation for the entire process. The following highlights why Staff's claim is pure hindsight and does not meet any of the recognized criteria for a finding of imprudence:

- Staff has not relied on the information and circumstances that were available at the time of the decisions that are now claimed to be imprudent because it invented its own forecasting approach after-the-fact and now holds it above all others;

- Staff has not provided any credible evidence that MGE's actions or decisions were outside of a range of reasonable or generally-accepted behavior. The only evidence it has presented, with the aid of hindsight, is a narrow view and discredited approach to demand forecasting; and

- MGE provided all the documentation requested by the Reliability Report format Staff agreed to. Staff reviewed and approved the demand forecasting process relied upon by MGE for a number of years prior to the ACA periods under review in this case and did not indicate the type of "problems" now claimed by Ms. Jenkins. (Reed Reb., p. 12)

VII. Risks Versus Costs

Viewed from a high level, design day demand planning attempts to ensure that there is enough gas available and deliverable to meet customers' needs during an extraordinarily cold period. In a sense, it is a type of "disaster planning."

What are the risks involved if MGE cannot deliver enough gas to meet demands? The Staff clearly recognizes there are dangers and severe consequences. (Staff 1996 Memo: DNK-2 p. 000137-000138 and Jenkins Dir., p. 2) Mr. Kirkland describes them also, and includes the potential human costs of injuries and deaths. (Kirkland Dir., p. 9) Since gas outages are relatively rare, it may not be widely known that before service can be safely restored, trained personnel have to go into each structure and shut off all the gas valves, and then return later to open them and assure that pilot lights are safely ignited. All of this can take a considerable amount of expense and time. It is certainly not something that you want to happen during subfreezing temperatures.

Another consideration here is that MGE has no financial incentive to maintain an unreasonably high level of upstream pipeline capacity. The expense for capacity is not a part of MGE's rate base so MGE does not earn a return on it. (Reed Reb., p. 31) In

fact, MGE has every incentive to keep this expense as low as is reasonably possible in order to make natural gas competitive with alternatives for heating fuel. MGE does have a statutory responsibility to provide safe and adequate service to its customers.

The Staff, in developing its narrowly focused approach that places too much emphasis on the raw results of a flawed regression, has not properly considered the significant risks associated with maintaining too little upstream capacity, especially since the risks associated with too much versus too little capacity are not symmetrical. (Reed Reb., p. 38) For purposes of illustrating the possible consequences of insufficient capacity, Mr. Reed prepared a detailed analysis. (Reed Reb., p. 33-38 and JJR-12) It does not attempt to predict any precise outcomes, but is designed to convey a general scope of what can be involved. What it reveals are these two scenarios:

- On a hypothetical basis, if MGE had exactly followed Ms. Jenkins' approach for these two ACA periods, MGE's customers would have saved the equivalent of roughly the cost of one gallon of milk each year. (Reed Reb., p. 31)

- If, hypothetically, Kansas City were to experience the same heatload factor that was experienced on January 3, 1999 (i.e., 60 HDD), but on a *very cold* day with temperatures at the Staff design day level of 81.5 HDD, and if MGE had contracted for capacity *exactly* following Ms. Jenkins' approach, Kansas City could have experienced a capacity shortfall of 15,000 MMBtu in 2000 and a shortfall of 44,000 MMBtu by 2005. (This example assumes the heatload factor experienced on January 3, 1999 is adjusted to account for an annual growth factor of 0.75%, which is not an issue in this case.) A capacity shortfall of this magnitude is equivalent to roughly the amount used on an extremely cold day by a medium sized city such as Raytown or Jefferson City.

A rational person should agree that the cost of a reasonable level of protection is insignificant compared to the possible consequences and sheer inconvenience of a widespread outage. Put another way, can you buy an insurance policy that covers you for a thousand dollars worth of damage to your house for about five bucks a year? Given a choice, wouldn't a rational customer prefer to pay a few dollars a year for the reasonable assurance that natural gas will be there to heat his or her home on the coldest night in a century? Would not a person, after being forced from their home on the coldest night of the century with water pipes freezing and bursting, willingly forego that excruciating experience for a few dollars a year?

Also, it is important to note that under extreme weather conditions, not only is the possible demand that will be placed on the system unknown in advance, but also the performance of all the utility's infrastructure required to serve that demand will be tested and the value of any redundancy will be very apparent. There is no "do-over" or "mulligan" if MGE does not have sufficient capacity when customers need heat during extreme cold conditions.

VIII. Summary

At the end, we are left with dueling forecasts of what level of demand MGE's customers will put on its system under extreme winter conditions with temperatures around 18°F below zero. The forecast prepared by MGE fits within industry norms. The one prepared by CEA was designed to be more "robust" than what MGE formerly used and to incorporate suggestions made by Staff; it too fits within industry norms. The one used by Staff has a lot of problems.

The Staff's allegation of excess capacity and imprudent decision-making in this case emanates from, and therefore rests solely upon, the predictive ability of the unaltered output of an algebraic equation where Staff chose all the inputs. The validity and reliability of data inputs are absolutely critical when you are relying on math to predict something that may occur in the future. Think back to 1999 when a faulty input number -- the result of someone at Lockheed-Martin failing to convert English measures to metric values -- caused the Mars Climate Orbiter, a $125 million spacecraft, to smash into the planet instead of reaching a safe orbit. You can think of other disasters that were caused by a misjudgment or bad prediction on how something would work under extreme circumstances, such as the skywalks at the Hyatt Regency in Kansas City. This is not a situation where you want to cut corners. Ultimately, if there is a capacity failure, the responsibility rests on MGE rather than Staff. As noted previously, there is no "do-over" if MGE relies on Staff's approach and it turns out, as indicated, to under-predict the actual demands because of its flaws. The customers of MGE could be exposed to significant injuries and costs.

MGE has clearly demonstrated that some of the values used by Staff for its inputs are unrealistic and unreliable. They deviate from widely-accepted definitions. They defy real-world observations. They do not represent what Staff claims. When they were fed into the Staff's regression, they produced a result that is the entire basis for the Staff's case. Garbage in. Garbage out.

In the grand scheme of things though, the forecasts are not all that far apart. A look at Schedule JJR-16 shows that if you plot out the predicted demand of Staff and CEA for the Kansas City area (which represents the majority of customer usage) all the

way to the extreme a design day type of temperature, they are not drastically different. If the Staff input errors were properly corrected, Staff could probably end up very close to the CEA result. The CEA result, as previously noted, is not materially different from what MGE obtained in the first place.

They are all *forecasts*. There is not just one true and correct answer. As Mr. Reed also observes, the most troubling aspect of Staff's position is that it attempts to use statistical analysis to draw a very specific, yet very arbitrary, "bright line" which it advocates as the basis for disallowance of costs. (Reed Sur., p. 36) Prudence really involves determining whether something is within a range of reasonable behavior. For the Staff in this case, there is no "range." It is either Staff's number, or pay up.

Respectfully submitted,

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Certificate of Service

I hereby certify that a true and correct copy of the above and foregoing document was either mailed or hand delivered or sent electronically this 22nd day of August, 2006, to:

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