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Issues:	*Price Risk Management and Hedging*
Witness:	*John H. Herbert*
Sponsoring Party:	*MoPSC Staff*
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Case Nos.:	*GR-2001-382, GR-2000-425, GR-99-304 and GR-98-167 (Consolidated)*
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MISSOURI PUBLIC SERVICE COMMISSION

UTILITY SERVICES DIVISION

SURREBUTTAL TESTIMONY

OF

JOHN H. HERBERT

MISSOURI GAS ENERGY

CASE NOS. GR-2001-382, GR-2000-425, GR-99-304 AND GR-98-167 (Consolidated)

Jefferson City, Missouri
April 2003

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Missouri Gas Energy's Purchased Gas Adjustment Tariff Revisions to be Reviewed in its 2000-2001 Actual Cost Adjustment	)))	**Case No. GR-2001-382**

AFFIDAVIT OF JOHN H. HERBERT

STATE OF VIRGINIA)
) ss.
COUNTY OF FAIRFAX)

John H. Herbert, of lawful age, on his oath states: that he has participated in the preparation of the following surrebuttal testimony in question and answer form, consisting of 17 pages to be presented in the above case; that the answers in the following surrebuttal testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true and correct to the best of his knowledge and belief.

John H. Herbert

Subscribed and sworn to before me this 18th day of April 2003.

Notary Public

My Commission Expires: 1/31/06

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(CONSOLIDATED)

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(CONSOLIDATED)

Q. Please state your name, occupation and business address for the record.

A. John H. Herbert, Independent Consultant, 2929 Rosemary Lane, Falls Church, Virginia 22042.

Q. Are you the same John H. Herbert that prepared direct and rebuttal testimony for this proceeding?

A. Yes, I am.

Q. Please state the purpose of your surrebutal testimony.

A. The purpose of my testimony is to respond to several issues addressed by Mr. Michael T. Langston's rebuttal testimony pertaining to Staff's proposed adjustments for Missouri Gas Energy (MGE or Company), Case No. GR-2001-382, more specifically relating to price risk management.

My direct and rebuttal testimony shows that even though Mr. Langston incorrectly relies on the current prices and predictions about prices to guide his supply management decisions, he gets both the history and forecasts of price behavior wrong. This testimony will show that Mr. Langston's claims about price behavior are not supported by market facts.

My testimony also shows that Mr. Langston consistently ignores information about price risk in his supply management decisions. This lack of attention appears to result in Mr. Langston consistently increasing his customer's exposure to price risk even when the price risk is great.

As a consequence of his not paying attention to customers exposure to price risk and the amount of price risk, Mr. Langston's decisions left MGE's customers uninsured to significant amounts of price risk.

Mr. Langston suggests in his testimony that 30% of normal volumes based on normal heating degree days for heating season months is not a useful indicator for measuring utility customer volumes exposed to price risk that can and should be hedged. He also suggests that volumes based on warmest heating degree days for heating season months is not a useful indicator for measuring utility customer volumes exposed to price risk that can and should be hedged. Therefore, this testimony provides some history about these and related indicators. As in "The General Report on Analysis of Gas Supply and Hedging Practice by Regulated Natural Gas Utilities in Missouri" and my direct and rebuttal testimony, the common sense appeal of such indicators is also addressed. At the end of the day the management of price risk is about volumes exposed to price risk and price risk.

This surrebuttal testimony also supplies quantitative information on how high natural gas price volatility is relative to other commodities and where such information can be found.

Price Behavior in November, the First Heating Season Month

Q. On page 17, lines 5 and 6 of Mr. Langston's rebuttal testimony, he states that by selling supplies into the market in November, "MGE would effectively be dumping gas into the market at prices likely well below the price for which it had purchased gas . . . ."

Again on page 19, Mr. Langston claims that MGE utilized its storage in November "to avoid over-nominating flowing gas, and thereby (i) protect customers from potentially higher costs that could result from having to sell excess flowing gas in the market at depressed prices; . . ." Do you agree with this statement?

A. Market facts indicate that this statement is totally inaccurate. This statement is perhaps based on memory or limited information.

A different view from Mr. Langston emerges when we rely on market facts, that is price information for the period 1993 through 2002 for the Henry Hub in Louisiana.

The Henry Hub index is chosen for a variety of reasons. It is highly correlated with the Williams system price index in Oklahoma and other locations where MGE and other Missouri companies purchase much of their natural gas. The Henry Hub market, moreover, is the major gas market in the United States. The Henry Hub market supports much more trading than most other markets and is used as an overall market indicator throughout the country. Accordingly, the Henry Hub index, or some closely correlated index is used in contracts to set the price of natural gas (be it fixed or variable) for companies in Missouri and most everywhere else. Moreover, the Henry Hub series has been used for years starting in 1993. Before 1993 daily trading even at the Henry Hub was not very active. Most other daily markets were thin prior to 1996. Thus, using the Henry Hub price allows us to get a more comprehensive view of price behavior than using other indices. Both the Henry Hub index and the Williams Oklahoma index are published in Gas Daily. Thus, this is information the company could and should have known prior to and during the heating season 2000/2001.

When we view the price information (See Schedule 1 attached), we find the following. Price tended to increase during November in 4 years (1993, 1995, 1996 and 2000). Price tended to decrease in 3 years (1997, 1999 and 2001) and it exhibited neither a strong increase or decrease throughout the month in 3 years (1994, 1998 and 2002). Conclusion: price in November does not exhibit any general systematic behavior.

The size of the daily increase in price from first-of-the-month price for each November over all years suggests that the avoided costs because the company bought more gas at first of the month, and thus avoided paying a higher cost later in the month, are great. Moreover, these avoided costs appear to be greater than the cost of having to sell unneeded gas into the market in those years when price declined. When we sum the changes in price in November in Schedule 1 for those years when price increased (GAINS) and compare them to the sum of the changes in price in those years when price declined (LOSSES) prior to year 2000 we obtain the following:

GAINS	LOSSES	NET GAIN
$1.74	-$1.44	$0.30

Thus, there is a net gain of $0.30/MMBtu. If we include November 2000, 2001 and 2002 we obtain a net gain of $1.92.

However, this is not to suggest that the purpose of more first of the month purchases when storage levels are low, as described in Lesa Jenkins' direct, rebuttal and surrebutal testimony is economic gain. The purpose of the approach laid out by Ms. Jenkins was that by purchasing more first of the month natural gas the company would preserve storage volumes so that customers would not be unnecessarily exposed to price risk in a later month when price risk exposure is generally greater.

Moreover, the examination of other market information can help us understand the price behavior in Schedule 1.

Starting in 1994 weekly inventories of natural gas began to be reported by the American Gas Association. No series is tracked more closely in the gas industry than this storage series because this series provides information on the current condition of the natural gas market and there is no better non-price current indicator. In my rebuttal testimony starting on page 11, line 16 and ending on page 13, line 8 a storage series representing storage in the producing region was reported.

The following is discussed in my rebuttal testimony and also in the report "The General Report on Analysis of Gas Supply and Hedging Practice by Regulated Natural Gas Utilities in Missouri." When storage levels in the producing region decline relative to year earlier levels this indicates that supplies are relatively tight. This is similar to most other goods that are sold on markets. When the number of items on the shelf declines relative to year earlier levels, this indicates that available supplies are tight relative to demand in the current year. This type of comparison is particularly relevant for seasonal businesses such as the gas business.

Viewing November 1996, which like November 2000 also exhibited a significant price increase, is instructive. In November 1996 and November 2000 storage levels in the producing region were much below year earlier levels. In both years heating degree days on a day by day basis and on an overall basis were also above year earlier levels. Hence, the price rose.

On the other hand storage levels in the producing region in November 1997 were above year earlier levels and during the month and over the entire month heating degree days were low relative to year earlier levels. Hence, the price declined.

Now, the way that heating degree days evolved during the month cannot be known ahead of time which is why the industry on an ongoing basis tracks current and day-ahead temperature forecasts as part of its normal management of supplies. However, the information about storage is different. It is a basic indicator of the conditions of the market.

In October and November 2000 our storage series was as low as it had ever been previously at that time of the year, a sure sign that readily available supply was tight relative to demand. Instead of focusing on such a series Mr. Langston made a decision to order modest amounts of first of the month supplies. It is not entirely clear what Mr. Langston was specifically focusing on when making this decision. Perhaps it was the fact that prices were high as reported in the trade press. It certainly wasn't price volatility.

Mr. Langston followed the same casual approach to decision making in late November 2000 in ordering supplies for December. He states now that he expected the price level to drop because prices were at historically high levels. Yet, most importantly he did provide the type of evidence he relied on in making this decision. He relied on information in Schedule MTL – 24 which is a newsletter dated November 27, a Monday. He relied on dated short-term weather forecasts included in a secondary source in making his decision. This secondary source indicated that, when the weather forecast calling for above normal temperatures in the central US and "**normal**" weather for the entire country was combined with recent storage information, the net result on price was a wash. Thus, Mr. Langston cannot even make the claim that his price speculation that prices would decline was

supported by a strong signal from an uncertain weather forecast for a limited number of forward days.

Mr. Langston thought the price level was likely to decline. Again he made the decision to order modest amounts of first of the month supplies at the end of November for December even though storage levels in the producing region relative to year earlier levels continued to decline in November and were then at historically low levels for the end of November.

Mr. Langston also ignored the fact that the same newsletter on the same page indicated that price volatility for December was 61% and for January was 82%, indicating a large amount of price risk in the market. Again Mr. Langston appears to have been oblivious to and unconcerned with price risk.

The large price risk and the precarious storage situation were facts known at the time both prior to and during the heating season.

Unconcerned with price risk and continuing to speculate on price, Mr. Langston continued to dig his customers into a hole by withdrawing enormous amounts of natural gas from storage in December. This is explained in a variety of ways in Lesa Jenkins' direct, rebuttal and surrebutal testimony.

One might ask oneself the question "What explains Mr. Langston's behavior and his blind spot with respect to price risk?" The explanation is straightforward.

Mr. Langston does not consider the price forecasts that guide his decision making to be speculations, and I quote Mr. Langston, "MGE ordered less flowing supplies for December 2000, not because it was speculating or as a result of mismanagement, but rather because MGE was reasonably managing its system based on the circumstances and facts

known at the time, which indicated that gas prices would recede from their unprecedented high levels."

The Price Level in January When Price Risk Exposure is Usually Greatest Compared to November When It is Usually Much Less

Q. On page 23, line 18 through line 20 of his rebuttal testimony, Mr. Langston states: "the flaw with Staff's proposed approach is that it also assumes that natural gas prices are also directly tied to heating demand and thus highest in January, and this is simply not the case." Do you agree with this?

A. Not at all. When we take the same comprehensive daily price information presented previously in Schedule 1 and compare the average price for January with November for the period prior to year 2000, we find that the January price exceeds the November price by $1.14 (see Schedule 2 attached to this testimony). This dollar amount is almost 50% of the average price of $2.40/MMBtu for November for the period. When we do the same sort of comparison using Inside FERC first of the month indices we get much the same results.

While we don't want to suggest that price level is a controlling factor for price and supply risk management, it is just that when Mr. Langston refers to the standard of price level that guides his behavior he gets the market facts wrong.

For prudent supply and price risk management it is the volume of natural gas that is exposed to price risk and the amount of price risk that matters. Mr. Langston imprudently increased MGE customers exposure to price risk during the heating season because he wasn't focused on price risk nor on how his decisions were consistently increasing MGE customers exposure to price risk.

Price Risk for Natural Gas Compared to the Price Risk for Other Commodities

Q. You mention that Mr. Langston ignores price risk and price risk is important because it indicates the possible damage to customers from utilities not hedging much of their customer requirements. But, if price risk is small and not large as you suggest, then Mr. Langston is right in ignoring price risk. What kind of evidence do you have and what kind of evidence can we check to assure ourselves that natural gas price risk is great?

A. First, the Energy Information Administration in a report "Derivatives and Risk Management in the Petroleum, Natural Gas, and Electric Industries" published recently in October 2002, included a table in its Executive Summary Table S1. This table listed spot market price volatilities for a variety of physical commodities generally for the period 1989 through 2001. Major physical commodities are listed below:

Commodity	Price Volatility
Natural gas	78.0%
Light Sweet Crude Oil	38.3%
Motor Gasoline	39.1%
Heating Oil	38.5%
Copper	32.3%
Gold Bar	12.0%
Silver Bar	20.2%
Platinum	22.6%
Coffee	37.3%
Sugar	99.0%
Corn	37.7%
Soybeans	23.8%
Cotton	76.2%
Orange Juice	20.3%
Cattle	13.3%
Pork Bellies	71.8%

Natural gas price volatility is higher for all listed physical commodities except for sugar, and it is generally much larger than for oil products which are much in the news because of the high price volatility associated with oil commodities.

Second, you can daily check price volatility estimates for a variety of commodities as provided by price reporting services such as Bloomberg. When you do this you will often find that the price volatility for natural gas to be greater than these other commodities.

Third, you can simply compare the high and low price for a commodity during a year. Such a comparison is shown for copper, wheat and natural gas for 1998 as part of Figure 3 in an article published in 1999 in the Public Utilities Fortnightly. The percentage difference between the high value and the low value is much greater for natural gas than for these other commodities. The percentage differences between the high and low prices for the commodity during a year was used in the article because it provides a relatively transparent indicator of relative amount of price volatility. The percentage differences for the high and low prices for copper and wheat are 32% and 46%, respectively. The percentage difference for the high and low prices for natural gas is 106%.

We can also use the ratio of the high and low prices for a year as a basis for deriving annualized estimates of price volatility. When we do this we obtain a value of 52% for natural gas, a value of 20% for copper and a value of 27% for wheat.

Fourth, some indication of the high price volatility associated with natural gas can be obtained from viewing the open interest for the variety of commodity option contracts published daily in the Wall Street Journal. Interest in the option market for commodities is much driven by price risk or price volatility because it is a market for price risk insurance. The value for open interest can be viewed as the number of outstanding insurance policies. For example, on April 1, 2003, a date that is easy to check by going to a library and viewing a copy of the Wall Street Journal, open interest for the natural gas call option was 482,419. Open interest for other important commodity option contract markets on the same day was

218,024 for corn and 121,977 for soybeans. Open interest for the call option for natural gas was actually greater than all other commodity contracts, except for crude oil, reported in the Wall Street Journal on April 1, 2003.

The most important concept for a utility to address as part of a price risk management program is price risk or price volatility not price level. Moreover, examples of how to compute this number using price figures relevant to MGE is also included as Figure 3 in the report "The General Report on Analysis of Gas Supply and Hedging Practice by Regulated Natural Gas Utilities in Missouri."

The Importance of Volumes Exposed to Price Risk for a Price Risk Management Program

Q. Doesn't Mr. Langston continue to focus on price level or cost because it is crucial for a prudent utility price risk management program?

A. No, the consideration of the expected price level is not crucial for a price risk management program. This is discussed in my direct testimony, rebuttal testimony and "The General Report on Analysis of Gas Supply and Hedging Practice by Regulated Natural Gas Utilities in Missouri."

The focus of a utility price risk management program is first of all about volumes exposed to price risk. This is discussed from page 3, line 6 to page 6, line 10 and from page 9, line 4 to page 11, line 7 of my direct testimony. The main body of my direct testimony is only 10 pages long, so the large portion devoted to this single, general item emphasizes its importance.

The importance for a utility company to focus on the volume of customer requirements exposed to price risk is discussed at length in "The General Report on Analysis

of Gas Supply and Hedging Practice by Regulated Natural Gas Utilities in Missouri." The report also discusses the portion of these volumes that can be effectively hedged. The report, itself was included as Schedule 2 in my direct testimony. A partial list of relevant page citations is included below:

1. Bottom of page of Schedule 2-7 to the next to the last paragraph of Schedule 2-9;

2. Item 1, Schedule 2-13;

3. Item 3, Schedule 2-14;

4. 1st paragraph, Schedule 2-40;

5. Item 1 in check-sheet on Schedule 2-79;

6. Item 1, 3 and 4 on Schedule 2-82;

7. Section 8.3 "Measuring Price Risk Exposure" on Schedule 2-86 to last complete sentence on Schedule 2-87; and

8. Item 1, Schedule 2-98.

The Importance of Hedging at Least 30% of Normal Requirements

Q. On page 31 of Mr. Langston's rebuttal testimony he states that Mr. Herbert's "response also demonstrates the arbitrary nature of the 30% figure, and unbelievably, that it was developed, at least in part, on the amount of damages that it would calculate rather than assessing whether MGE's hedging practices for the winter of 2000/2001 were prudent." Do you agree with these claims?

A. Not at all. The imprudence is about the decision to leave or increase volumes of customer requirements exposed to price risk. Moreover, I was responding to a question about conversations with staff leading up to the use of the 30% of normal requirements as volumes that could be reasonably hedged by all utilities in Missouri. Mr. Herbert described

the conversation with staff during a conference call during which the 30% figure was decided. At the end of my answer to the question about the staff conference call conversation I included a thought that I had at the end of the conference call. My thought was that the damages would be much too low based on the 30% of normal requirements number. This was just a thought, as stated clearly, and I did not discuss it during the conference call. Moreover, the damage I was thinking about was the customers volumes exposed to price risk that I thought could have been effectively hedged by many utilities in Missouri. The greater the volume unnecessarily exposed to price risk the greater the possible damage. I thought a better figure would have been nearer 70% of normal requirements. Mr. Langston's incorrect interpretation of my answer is perhaps due to his total focus on price level and not on price risk and the volume exposed to price risk as the relevant measures for a utility price risk management program.

An insurance example might help. I have a relatively new car and my son is coming home and he will be driving the car. I currently have liability insurance. Because I believe my son is more likely to have a collision I additionally take out collision insurance. I don't assess what the expected level of cost will be if my son is in an accident before I take out the insurance since it is a very difficult number to estimate, as is the price level of natural gas. But, I would not pay more for the collision insurance than the car is worth. Thus, the cost of the car insurance is somewhat easier to assess. However, I take out the insurance because of the increased exposure to car damages from a collision because my son will be driving the car.

Mr. Langston's lack of focus on customers' expected volumes exposed to price risk is perhaps why he continues to not comprehend why Ms. Jenkins focuses on requirements by month that are dependent on expected levels of heating degree days.

Trading programs are executed on a day by day basis. Price risk management programs for a utility are based on expected volumes to be required by customers.

The greater the expected volumes or the greater the expected heating degree days the greater the price risk exposure.

All planning is done in terms of expected values. Mr. Langston would have us believe that planning is not based on expected values, and price risk management is about price level and not price risk or price volatility. I cannot support this position.

Q. Mr. Langston also claims on page 31 of his rebuttal testimony that the 30% of normal requirements number is arbitrary. Do you agree with this?

A. Not at all. As noted above, the importance of the volume to hedge and the fact that warmest heating season monthly requirements would be a reasonable figure for many utilities to hedge is discussed in several documents. It is discussed in the report "The General Report on Analysis of Gas Supply and Hedging Practice by Regulated Natural Gas Utilities in Missouri" and in my direct and rebuttal testimony. Moreover, the 30% figure was discussed with staff and considered a lower bound estimate of volumes to hedge since many utility companies would be expected to be able to effectively hedge a greater portion of their customers exposure to price risk.

Moreover, the importance of volumes to hedging is not new and has been discussed at hearings, workshops and in publications. Perhaps, it is worth summarizing this history here.

In Order No. 79/98 issued by The Public Utilities Board of Manitoba on June 19, 1998, it was determined that companies should focus on volumes not price in a utility hedging program. Volumes to hedge would be volumes that would be required by the Company. On page 91 and 92 of the Order, the Board stated: "Professor Herbert noted that the major purpose of hedging is to reduce exposure to price risk volatility. Instead of volatility, Centra paid more attention to price levels and whether current price fell above or below some price level in making its decision. In other words, Professor Herbert concludes Centra lost its focus on the commodity and instead focused on the price." Because the company did not focus on volumes to hedge and the maintenance of hedges to cover expected purchases, a disallowance of more than 28 million dollars (Canadian) was assessed on the stockholders and this cost was not allowed to be passed onto consumers.

It was subsequently determined that the Company should henceforth follow a passive hedging program and that the utility should hedge warmest year volumes. Once hedges were put in place they would stay in place. Warmest year volumes are, of course, not only larger than warmest month volumes for the heating season where each month is considered separately, but also much larger than 30% of normal requirements for most utilities.

In a subsequent workshop for the Michigan State Institute of Public Utilities on December 9, 1998, in Williamsburg, Virginia, expected utility requirements or sales to customers by month were discussed as a target for setting up a price risk management program. Expected utility requirements or sales to customers for heating season months are of course greater than requirements during warmest heating season months and greater than 30% of normal or expected requirements. Ken Zimmerman, chief economist at the Oklahoma

Commission who led the Oneok price risk management hearing cited in my rebuttal testimony attended this workshop.

During 1999, it was considered and discussed in a Public Utilities Fortnightly article whether a utility could hedge more than expected heating season month requirements. This fee article was well received and led to Public Utilities Fortnightly contracting for two additional utility hedging articles.

In testimony prepared for a proceeding Pennsylvania Public Utility Commission v. The Peoples Natural Gas Company, Docket No. R 00005068, May 2000, I stated on page 16 of my direct testimony that "[t]he futures contract market is a specialized market that allows purchases of a commodity to reduce price risk by locking in the commodity price. A utility takes a position in the futures market to compliment an expected purchase of gas in the cash market."

Also in year 2000 I conducted another workshop for Michigan State Institute of Public Utilities (IPU) on Price Risk Management for Utilities and their Regulators. In my audience at this workshop were senior officers at major companies, senior staff from utility commissions, and Ken Costello of NRRI, referenced as an authority on price risk management by Mr. Reed in his direct testimony.

A framework for effective price risk management programs was considered at the year 2000 IPU workshop. This framework considered requirements during warmest heating season months as requirements that could be effectively hedged by many utilities. Some utilities that had operational and contractual flexibility and expertise might hedge more. Only companies that had no operational or contractual flexibility might hedge less. Because natural gas price volatility is great and natural gas price changes are skewed towards high

values it is reasonable for a utility to consider hedging more than requirements during warmest heating season months.

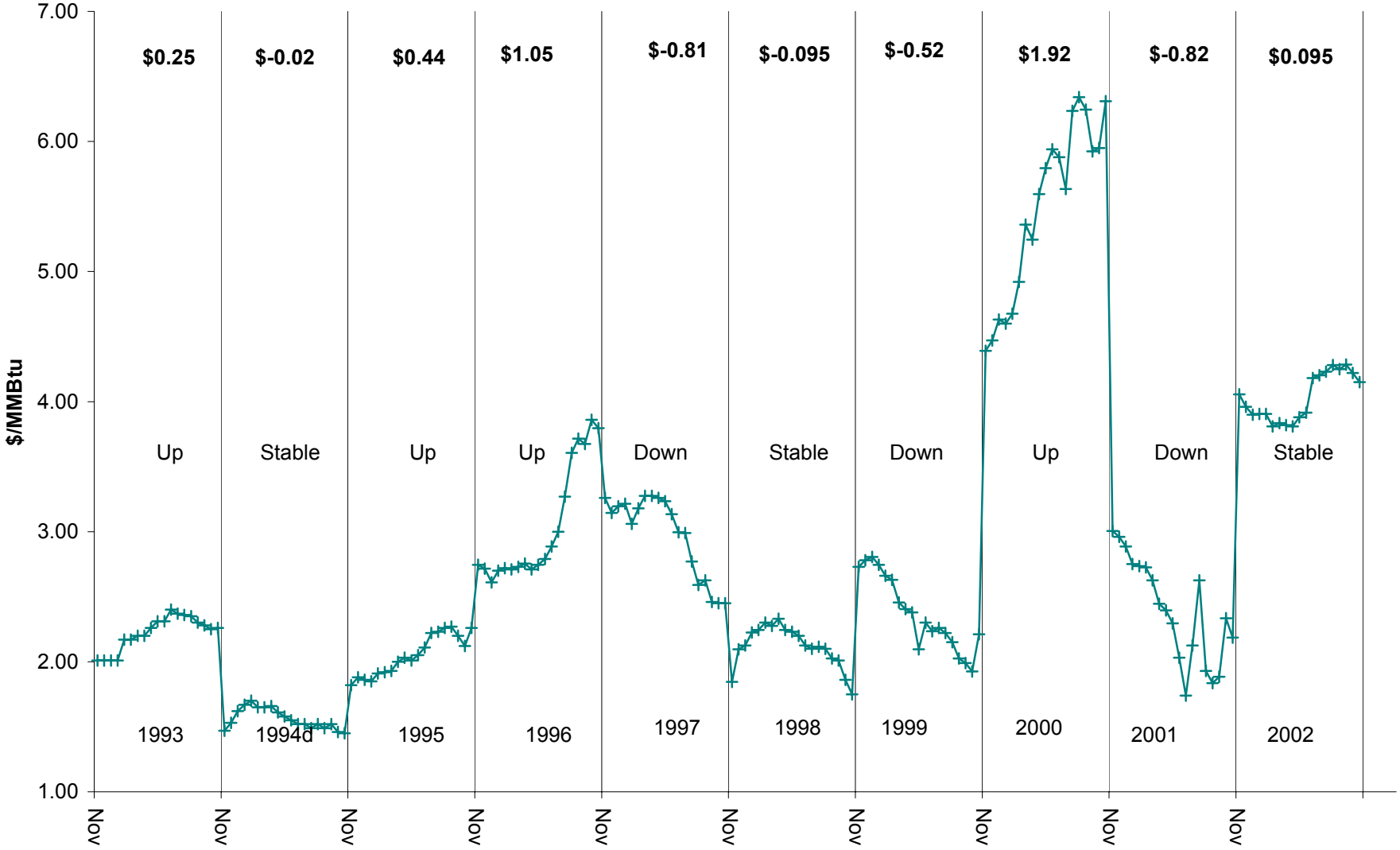
In publications, in proceedings and hearings at state commissions, at workshops for New York and Virginia Commission staff and administrative law judges, at a major utility company, the position that it is usually reasonable to manage price risk for warmest heating season month requirements has been discussed and maintained.

Q. Does this conclude your surrebuttal testimony?

A. Yes, it does.

Surrebuttal Schedule
John H. Herbert
MGE/Case No. GR-2001-382

Schedule 1. Daily Henry Hub Prices During November Sometimes go Up and Sometimes go Down and Sometimes stay relatively Stable But Overall Exhibit No General Behavior
- the sum of the changes in price for a month are also provided in bold type -



Surrebuttal Schedule
John H. Herbert
MGE/Case No. GR-2001-382

Schedule 2. OVERALL JANUARY PRICE EXCEEDS NOVEMBER PRICE BY $1.14
(Average Henry Hub Price in November and in a subsequent January)