STATE OF ILLINOIS

ILLINOIS COMMERCE COMMISSION

NORTH SHORE GAS COMPANY	:	
	:	
	:	No. 07-____
Proposed General Increase	:	
In Rates For Gas Service	:	

Direct Testimony of

BRIAN M. MAROZAS

Coordinator, Trading Risk Management Department
Peoples Energy Corporation

On Behalf of
North Shore Gas Company

March 9, 2007

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I. INTRODUCTION AND WITNESS BACKGROUND

A. Witness Identification

Q. Please state your name and business address

A. My name is Brian M. Marozas. My business address is 130 E. Randolph Drive, Chicago, Illinois, 60601.

Q. By whom are you employed and in what capacity?

A. I am employed by Peoples Energy Corporation. My present position is Coordinator in the Trading Risk Management Department.

B. Purpose of Testimony

Q. Mr. Marozas, what is the purpose of your testimony?

A. I will explain how I developed the forecast of normal heating degree days ("HDD") for North Shore Gas Company ("North Shore" or the "Company").

C. Summary of Conclusions

Q. Please summarize your conclusions.

A. Using a ten-year average (1997-2006) for HDD, I forecast 6,044 as the normal HDD.

D. Background and Experience

Q. Please briefly outline your educational background.

A. I have a BA in Mathematics & Statistics from Miami University, a BA in Engineering Physics from Miami University, and an MBA in Finance from DePaul University.

Q. Please summarize your work experience.

A. I joined The Peoples Gas Light and Coke Company ("Peoples Gas" or "Respondent") in 1991 as a member of the Gas Supply Planning Department where I performed various duties related to the operation of the demand forecast and supply optimization models for Peoples Gas and its affiliate North Shore. In 1998, I transferred to the Gas Supply Administration Department where I performed various duties related to the purchase, transportation and storage of natural gas for Peoples Gas and North Shore. In 1999, I became Risk Manager of Peoples Energy Corporation's Trading Risk Management Department where I performed various duties related to managing market, operational, and other risks at Peoples Energy Corporation's different business segments. In 2004, I assumed the position of Senior Financial Analyst in the Financial Analysis Department. In this position, I performed various duties related to financial modeling. These models are used for long-term strategic planning, merger and acquisition analyses, and large capital projects analyses. I have also reassumed the role of managing the demand forecast model for the utilities. In January 2006 I assumed my present position, and I perform various duties related to managing market, operational, and other risks at Peoples Energy Corporation's different business segments.

II. FORECAST OF NORMAL HEATING DEGREE DAYS

Q. On what did you base your forecast of normal HDD?

A. I based the forecast on actual historical observations of the yearly HDD data recorded at the O'Hare Airport weather station from 1960 to 2006.

Q. Please explain how you used this data to obtain a normal HDD forecast.

A. I used the common forecasting technique of using the average of historical outcomes to predict future outcomes. In this case, I used the average of historical annual HDD to predict weather one year into the future. For this analysis, I tested two alternative means of forecasting normal HDD: 1) a 30-year average of HDD data ending in 2006, and 2) a 10-year average of HDD data also ending in 2006. I then conducted a statistical comparison of the predictive capability of these two time horizons to determine which was more appropriate. Specifically, I first calculated and compared the root mean squared error for each of the two averaging periods. Second, to better understand these periods, I used a linear regression technique to examine the trending behavior of the HDD data.

Q. Please describe how you analyzed the HDD data.

A. The data series from O'Hare Airport weather station begins in 1960, so it was possible to calculate both 10-year and 30-year averages for the years ending 1989 through 2006. I compared the 10-year and 30-year average HDD figure for each year with the actual temperature observed one year later. For example, I compared the 10-year and 30-year averages for 1989 with the actual temperature for 1990, recording the difference (error) between the actual and forecasted values for each. I repeated this process for each year from 1990 to 2005, the most recent year for which actual data existed one year later. The analysis I conducted parallels the situation with which North Shore is confronted: using HDD data of the most recent year available (2006) in order to predict normal weather in the future.

Q. How did you compare the predictive capabilities of the two averages?

A. I conducted a statistical analysis to compare the predictive capabilities of the 10-year and 30-year averages. I calculated a standard statistic called the "root mean squared error" ("RMSE"). The RMSE statistic, which is widely used to measure the accuracy of forecasts, is a number representing the degree to which forecasted values differ from actual data. The smaller the RMSE, the smaller the overall differences between the actual and forecasted HDD. The formula for the RMSE is: $RMSE = \sqrt{\frac{1}{n}\sum_{i=1}^{n}\left(HDD_i - HDD_i^E\right)^2}$ where the letter *i* denotes the year of the observation, *n* denotes the total number of years (*i.e.*, 17), HDD_i refers to actual values, and HDD_i^E is the forecasted HDD. $\left(HDD_i - HDD_i^E\right)$, therefore, measures the difference between actual and forecasted value.

Q. Please describe your results.

A. My results are shown in Table 1. Based on O'Hare weather station's historical data, a 10-year HDD average outperforms a 30-year average in predicting weather one year into the future. In other words, as a forecasting instrument, 10-year averages tend to produce more accurate forecasts than 30-year averages. This statistic shows that the errors of 30-year averages are higher than those of 10-year averages by a magnitude of 32 HDD. Based on the RMSE test, therefore, a 10-year average (1997 - 2006) represents a better option for purposes of forecasting normal HDD.

Table 1

Historical Weather Analysis

HDD Average	RMSE
30-Year	553
10-Year	521
Difference	32

Q. You said you examined the data using a linear regression technique. Please explain.

A. Linear regression is a technique used to explain the relationship between two variables by finding a straight line that best fits the data. Here, the two variables are the year and the observed HDD, and the linear regression technique can be used to estimate a time trend in the O'Hare HDD data. I used this model to obtain a HDD forecast, using the trend line. To perform the regressions, I used Microsoft® Excel.

Q. What time period did you use to develop a forecast based on a linear regression?

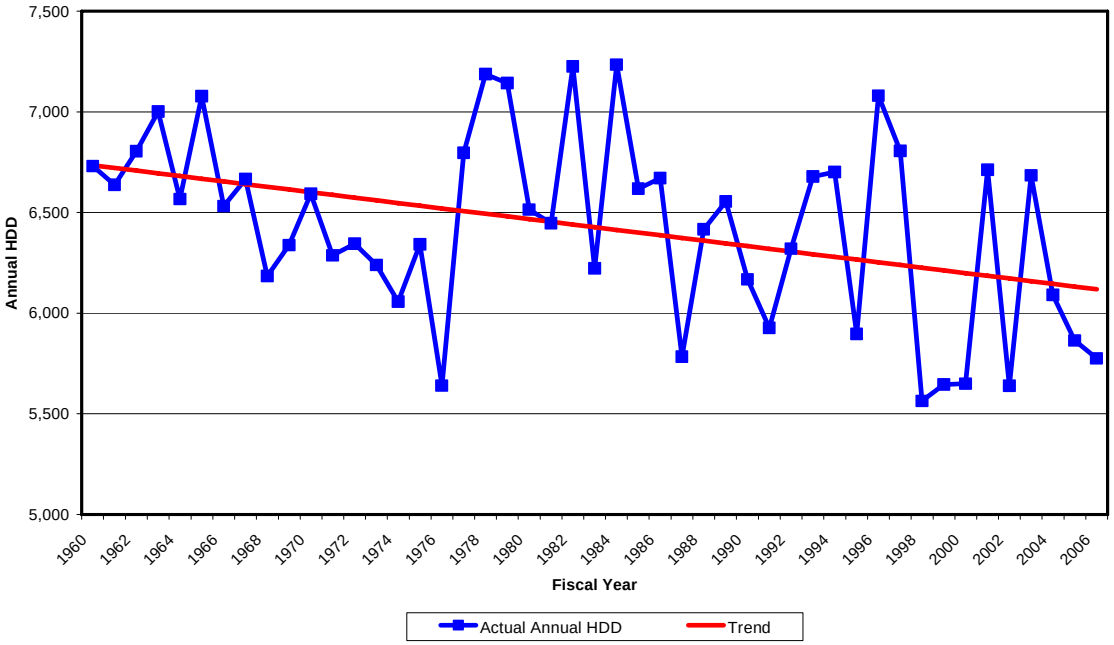
A. I used HDD data from O'Hare for fiscal years 1960-2006.

Q. What were the results of your regression analysis?

A. Figure 1 shows the annual HDD observations and the trend line that best fits these points for the years 1960-2006. The fitted line shows a downward trend that is statistically significant as measured by a t-statistic. Broadly speaking, a test of significance is a procedure by which sample results are used to verify the truth or falsity of a null hypothesis. In our case, the null hypothesis is that the trend line is flat (*i.e.*, there is no trend). In the language of significance tests, a statistic is said

to be statistically significant if the value of the test statistic lies in the critical region. This is a region of values that would make the null hypothesis improbable should the results of the test of significance fall into that region but would be relatively plausible for the alternative hypothesis (*i.e.*, there is a trend). In this case the null hypothesis (*i.e.*, no trend) is rejected. For the Company's regression analysis, the t-test would reject the null hypothesis for every explanatory variable in the trend line equations to the 99th percentile. In other words, each of the explanatory variables is statistically significant.

Figure 1



Q. What is the importance of this trend line to your analysis?

A. If a data series is "trend-less" (*i.e.*, the line slope is equal to zero), then its mean value will remain stable in time. In this case, an average calculated over a wide set of observations would be a good predictor of future values given that data is essentially mean stationary. However, the O'Hare HDD data shows a significant

downward trend. Under these circumstances, any prediction that relies on an average taken over a long period of time (*e.g.*, 30 years) ignores the historical progression of the HDD series and would not be expected to be as accurate as an average based on a shorter time period (*e.g.*, 10 years) relating to a more recent period.

Q. What do you conclude from your forecasting results?

A. Table 2 shows the projection based on the 2006 30-year and 10-year HDD averages at O'Hare.

Table 2

Normal HDD Forecast Analysis

	Results
30-Year Average	6,401
10-Year Average	6,044

As noted above, given the clear downward trend in HDD, a forecast based on a 30-year HDD average will tend to overstate expected HDD. A 10-year HDD average has less of a tendency to overstate HDD since it focuses on a more recent period, thus partly reflecting the historical downward trend in HDD. A forecast based on the 10-year average reflects the historical trend, without forecasting that the trend will continue. Based on these observations and the RMSE test results, I conclude that a 10-year HDD average, 6,044 HDD, provides an appropriate forecast of normal weather.

Q. Does this conclude your direct testimony?

136 A. Yes, it does.