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Issues: Weather Normalization
Witness: Curt Wells
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Case No.: GR-2006-0387
Date Testimony Prepared: September 13, 2006

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY OPERATIONS DIVISION

DIRECT TESTIMONY

OF

CURT WELLS

ATMOS ENERGY CORPORATION

CASE NO. GR-2006-0387

Jefferson City, Missouri
September 2006

Staff Exhibit No. 136
Case No(s). GR-2006-0387
Date 11-30-06 Rptr PF

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Atmos Energy Corporation's Tariff Revision Designed to Consolidate Rates and Implement a General Rate Increase for Natural Gas Service in the Missouri Service Area of the Company.	))))))	Case No. GR-2006-0387

AFFIDAVIT OF CURT WELLS

STATE OF MISSOURI)
) **ss**
COUNTY OF COLE)

Curt Wells, of lawful age, on his oath states: that he has participated in the preparation of the following Direct Testimony in question and answer form, consisting of 5 pages of Direct Testimony to be presented in the above case, that the answers in the following Direct Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true to the best of his knowledge and belief.

Curt Wells

Subscribed and sworn to before me this 11th day of September, 2006.

ROSEMARIE RIEDL
MY COMMISSION EXPIRES
June 1, 2009
NOTARY SEAL
#06509538
COLE COUNTY
NOTARY PUBLIC, STATE OF MISSOURI

Notary Public

My commission expires June 1, 2009

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Q. Please state your name and business address.

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

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

A. I am a Regulatory Economist in the Energy Department of the Utility Operations Division.

Q. Please review your educational background and work experience.

A. I have a Bachelor's degree in Economics from Duke University, a Master's degree in Economics from The Pennsylvania State University, and a Master's degree in Applied Economics from Southern Methodist University. I have been employed by the Commission since February, 2006. Prior to joining the Commission, I completed a career in the U.S. Air Force, which included assignments as a navigator in weather reconnaissance aircraft, and later in the Purchasing/Contracting area as Contract Negotiator and Administrator, Contracting Policy Manager, Installation Purchasing Department Chief, and Contracting Program Manager.

Q. Have you filed testimony in prior cases?

A. Yes. I filed testimony in the following rate cases:

Case Number	Company	Issue
ER-2006-0315	Empire District Electric Company	Revenue
ER-2006-0314	Kansas City Power & Light Company	Weather, Revenue

Both cases are now pending before the Commission.

EXECUTIVE SUMMARY

Q. What is the purpose of your testimony?

A. I will explain my calculations of actual and normal heating-degree-days (HDDs), which I furnished to the Rates/Tariffs Section of the Energy Department. Daily actual and normal HDDs are required for the weather normalization analysis.

Q. How is your testimony organized?

A. I have organized my testimony in the following sections: Definition of Heating Degree-Day (HDD), Selection of Weather Stations, Types of Weather Stations, and Weather Variables.

DEFINITION OF HEATING DEGREE DAYS

Q. What is a heating degree day?

A. Degree days are weather measures that were originally devised to evaluate energy demand and consumption. Degree days are based on how far the daily average temperature departs from a human comfort level of 65 degrees Fahrenheit (°F). Heating degree days are used to examine the relationship between cold weather and space heating.

Q. How are HDDs calculated?

A. HDDs are calculated as the number of degrees the daily average temperature is below 65° F, and are set equal to zero when the daily average temperature (TAVG) is above

65° F. The daily average temperature is the average of the day's maximum (TMAX) and minimum temperatures (TMIN).

Q. What is the source of your data on TMAX and TMIN?

A. The TMAX and TMIN data were gathered by the National Oceanic and Atmospheric Administration (NOAA) for the test year, and for the current NOAA normals period, January, 1971 through December, 2000.

SELECTION OF WEATHER STATIONS

Q. How did you select the weather stations to be used in the present case?

A. Because the service territory of Atmos Energy Corporation (Atmos or Company) is scattered across the state of Missouri, Staff witness Henry Warren and I collaborated on the choice of weather stations, which were based on the geographic distribution of the Company's customers and completeness of the weather data. The stations selected were Butler in the West, Poplar Bluff and Cape Girardeau in the Southeast, Kirksville in the North, and Hannibal and Steffenville in the Northeast.

TYPES OF WEATHER STATIONS

Q. What types of weather stations are maintained at the selected locations?

A. Cape Girardeau is a First Order station. The others are Cooperative stations.

Q. What is the difference between the two types of weather stations?

A. First-order weather stations are usually located at regional or municipal airports, where professional observers continuously monitor the weather instruments. The instruments record daily TMAX and TMIN, along with hourly observations of precipitation, temperature, dew point, wind and other weather elements. In contrast, trained volunteers usually man Cooperative Network weather stations, where they record daily observations of

TMAX, TMIN and precipitation. Both first-order and cooperative network stations meet the same NOAA quality control standards.

WEATHER VARIABLES

Q. What weather variables did you develop for the present rate case?

A. I developed the daily actual HDDs and the daily normal HDDs for the Rates/Tariffs Section of the Energy Department to weather normalize Company's sales and revenues. Staff witness Mr. James Gray is testifying to the weather normalization analysis and results that used the daily actual and normal HDDs.

Q. How did you calculate daily HDDs for the test year?

A. I calculated daily HDDs as the number of degrees below 65 each day's average temperature is. Average temperature is arrived at by averaging the NOAA's daily TMAX and TMIN for each station.

Q. How did you calculate adjusted daily HDDs for each of the days in the 30-year period, January 1, 1971 through December 31, 2000?

A. I first tabulated daily TMAX and TMIN for each day in these 30 years for each station, as well as for selected alternate weather stations where data were missing from the chosen weather stations. This was necessary because NOAA only adjusts the monthly average temperatures; it does not correct for missing daily data. I adjusted actual daily TMAX and TMIN for these 30 years so that the monthly averages of the adjusted daily TMAX and TMIN were equal to the adjusted monthly average TMAX and TMIN that NOAA uses to calculate the monthly station normals over the same period. Adjusted daily TAVG and HDD for each day in the thirty- (30-) year history were then calculated as discussed above. The details of the tabulation and adjustment processes are shown in my workpapers.

Q. How did you determine the daily normal HDDs for the weather normalization analysis?

A. I determined the daily normal HDDs by averaging the adjusted daily HDDs for each calendar date, without respect to the year. For example, the 30 observations of actual HDDs for January 1st of each year were averaged to determine the normal HDDs for January 1st.

Q. Does this conclude your Direct Testimony?

A. Yes, it does.