BEFORE THE STATE CORPORATION COMMISSION

OF THE STATE OF KANSAS

DIRECT TESTIMONY

OF

PAUL DIETZ

WESTAR ENERGY

DOCKET NO. 11-WSEE-377-PRE

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Paul Dietz. My business address is 818 South Kansas Ave. Topeka, KS 66601.

Q. BY WHOM AND IN WHAT CAPACITY ARE YOU EMPLOYED?

A. Westar Energy, Inc. as Manager of Marketing Services.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I hold a master's degree in economics and master's of business administration degree in Finance from the University of Kansas, a master's degree in computer information technology from Regis University in Denver, Colorado, and a bachelor's degree in Economics from the University of Kansas. I have worked in a quantitative analysis / financial engineering role since I left the

Kansas Corporation Commission in May 2000. I was employed as a managing research economist at the Commission from December 1996 until May 2000. Additionally, I hold the Financial Risk Manager certification from the Global Association of Financial Risk Managers.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE COMMISSION?

A. Yes I have. I testified in Docket Nos. 97-WSRE-676-MER, 98-KGSG-611-TAR, 97-WSRG-486-MER, 97-KCPE-661-RTS, 98-MDWG-370-COC, 98-KGSG-475-CON, 00-KGSG-162-PGA, 08-WSEE-309-PRE, and in 08-WTEE-104-RTS.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I explain the model used by Westar to generate its annual peak load and energy forecasts. I also briefly discuss the capacity Schedule 3A tariff charges Westar will begin collecting from non-dispatchable generators including wind generators.

II. LOAD FORECASTING PROCESS

Q. DID WESTAR AND STAFF DEVELOP AND IMPLEMENT A MUTUALLY ACCEPTABLE PEAK LOAD FORECAST MODEL CONSISTENT WITH THE ORDER IN DOCKET NO. 07-WSEE-616-PRE?

A. Yes. We accomplished this by fall 2008. Since then, Westar and Staff have made periodic changes and updates to the model.

Q. WHAT ARE THE FACTORS THAT DRIVE WESTAR'S PEAK LOAD?

A. Westar's peak load is primarily influenced by four factors: weather, business cycle conditions, time structure (e.g., seasonal and daily), and long term growth in Westar's service territory.

Q. HOW DOES THE MODEL CAPTURE THE INFLUENCE OF WEATHER ON PEAK LOAD?

A. The model captures the influence of weather on peak load through use of the hourly ambient and dew point temperatures (in °F). The model clearly shows, as expected, higher temperatures produce larger peak load forecasts. Additionally, a higher dew point temperature is associated with higher relative humidity, contributing to higher load.

Q. HOW DOES THE MODEL CAPTURE THE INFLUENCE OF THE BUSINESS CYCLE?

A. Economic theory suggests that (real) interest rates offer a window to the overall health and growth prospects for the larger, macro-economy. According to that theory higher interest rates indicate an economy with relatively robust growth prospects, while low interest rates – like those we currently see in the market place – suggest the opposite. Thus, when interest rates increase, the model shows an eventual increase in load, including peak load. Falling interest rates imply a slower growth or even reduction in peak load.

Q. HOW DOES THE MODEL CAPTURE THE LONG TERM GROWTH FACTOR?

A. Customer growth as well as expansions and contractions in their facilities are captured by the inclusion of a time trend variable. The time trend variable captures what economists call the secular or long-term average growth trend.

Q. PLEASE DESCRIBE THE "TIME STRUCTURE" COMPONENT OF THE MODEL.

A. The time structure component relates to weekdays, weekends, months, seasons, and holidays. For example, a system peak is unlikely to occur over a weekend or on Fridays. By contrast, peaks are more likely to occur Tuesdays, Wednesdays, or Thursdays. Additionally, peaks are unlikely to occur over holidays and days immediately preceding or following a holiday. There is also a "seasonal" component among the time structure variables: the peak is less likely to occur in either late June or early September and more likely during the months of July and August. The model captured all of these time structure features.

Q. PLEASE DESCRIBE WESTAR'S PEAK LOAD FORECAST MODEL.

A. The model captures various component trends or cycles in the behavior of Westar's peak load. As a baseline, it captures the long-term growth trend, which shows steady growth of about one

percent per year. It captures the variation around that trend due to the business cycle. It captures the influence of temperature and time structure, day of the week, holiday, and other relevant factors. By successfully capturing these components, Westar and Staff, have developed a reasonably accurate peak load forecast model.

Q. FOR WHICH MEASURE OF PEAK LOAD IS WESTAR PRESENTING FORECASTS?

A. The peak load forecasts presented here are for Westar's Native Load series.

Q. HOW DOES WESTAR DEFINE ITS NATIVE LOAD?

A. For purposes of this docket, native load is defined as the summation of its Westar North native load series, Westar South load responsibility series, and KEPCo load series. Put another way, it is the total load attributable to Westar's retail and full requirements wholesale customers. The latter includes all of Westar's Generation Formula Rate (GFR) customers, including KEPCo, and Westar North full requirements customers served under grandfathered wholesale contracts.

Q. CAN YOU BRIEFLY DESCRIBE THE DATA SET USED TO ESTIMATE THE PEAK LOAD MODEL?

A. Hourly data observations are drawn from the time period 1997 through 2009. Since the peak is almost certain to occur between

June 15 and September 14, we use observations for the period between those days.

Q. DOES WESTAR'S NATIVE LOAD PEAK FORECAST SERVE AS THE BASIS FOR ITS GENERATION CAPACITY EXPANSION PLANS?

A. Yes. The native peak load estimate is one of the most important items considered by Westar when contemplating capacity additions.

Q. WHAT SORT OF WEATHER SCENARIOS DOES WESTAR USE TO FORECAST ITS PEAK LOADS?

A. Because the peak load usually occurs during the hottest hour of the summer, Westar and Staff have developed a model of the summer extreme temperatures for both Topeka and Wichita based upon historical weather data. Our expectation is that the peak load is most likely to occur when the temperature is about 105° F at Topeka and 107° F at Wichita.

Q. IN YOUR OPINION, HOW WELL DOES THAT FORECAST WEATHER SCENARIO WORK?

A. For capacity planning purposes, it works very well. The all-time record highs are about 111° F at Topeka and about 115° F at Wichita, so evidence shows it can be much hotter than what Westar uses as its extreme weather scenario. However, over the long-run of 30 or more years, Westar does expect the *average* summer peak

temperatures to be about 105° F and 107° F. This suggests Westar is using a *normalized weather scenario* for its peak load forecasting.

Q. TURNING NOW TO WESTAR'S ANNUAL ENERGY FORECASTS, WHAT IS THE BASIS FOR THOSE FORECASTS IN THIS PROCEEDING?

A. Westar uses an hourly model to forecast the hourly native load for each hour of the year. Like the peak load model, the hourly load model was developed in collaboration with Staff. The design and specification of the hourly load model is very similar to that of the peak load model. While the models are not identical, the hourly model is effectively an hourly analog of the peak load model. Both models rely on hourly ambient temperature and dew point temperature, both rely on the same measure of interest rates (12 month treasury bills), both rely on similar time structure components: day of week, holiday, season, etc., both include a time trend variable, and both are models of the same load metric – native load.

Q. YOU SAY THE TWO MODELS ARE "NOT IDENTICAL." WHAT ARE THEIR PRINCIPAL DIFFERENCES?

A. There are two such differences, both motivated by a technical consideration – the need to mitigate the effects of serial correlation. The model of hourly load includes prior hour and prior day

observations of the native load as explanatory variables, while the peak load model does not. This is because the hourly model is a model of differences (or changes in levels) while the peak load model is a model of levels. Nevertheless, in terms of their motivation, empirical basis, basic underlying structure, and theoretical support, the two models are effectively equivalent.

Q. WHAT SORT OF WEATHER SCENARIO DOES WESTAR USE TO FORECAST ITS HOURLY ENERGY LOADS?

A. For each hour of the year, Westar uses the average hourly temperature over the 1997 through 2009 time period. That is equivalent to using a 13-year temperature norm for each hour. As additional weather data becomes available, the calculation of the hourly temperature norm is updated. For example, when the hourly model is re-estimated in 2011, hourly temperature observations over the 1997 through 2010 time period will be used to establish the 14-year temperature norm as the new hourly weather forecast scenario. A comparison of the 20- and 30-year norms with the 13-year norms reveals no significant difference for almost all hours of the year.

Q. DO WESTAR AND STAFF RETAIN THE OPTION OF MODIFYING EITHER OF THESE LOAD MODELS?

A. Yes. From time to time these models will be reviewed and changed as necessary to take advantage of our improved understanding. Our goal is to improve the forecast accuracy of both models.

III. COST OF INEFFICIENT DISPATCH

Q. DOES THE INTRODUCTION OF RENEWABLE GENERATION RESOURCES AFFECT WESTAR'S OPERATIONS?

A. Yes. As a balancing area authority, we are required to keep generation and load in balance in our balancing area. Because renewable resources such as wind are non-dispatchable, we must be ready and able to react to unanticipated changes in output from such generation sources. The activity we perform to keep these resources in balance is called "regulation service."

Q. WHAT DO YOU MEAN BY "NON-DISPATCHABLE"?

A. Conventional generation, such as our coal and natural gas fired plants, is "dispatchable." In other words, the output of such plants can be controlled by varying fuel input and other factors to generate a certain amount of energy. The output of wind generation, however, depends on wind speed. Consequently, such generation is uncontrolled and largely unpredictable. Wind generation cannot be "dispatched" to a specified level and output from such resources can change quickly and without notice as wind conditions change.

Q. HAS WESTAR MADE AN EFFORT TO DETERMINE THE COSTS ASSOCIATED WITH SUCH UNPREDICTABLE CHANGES IN OUTPUT?

A. Yes. In fact, we developed a rate to be assessed non-dispatchable generation resources located inside our balancing area. We filed the rate with the Federal Energy Regulatory Commission (FERC) as Schedule 3A of our Open Access Transmission Tariff. It is currently pending before FERC.

Q. WHAT IS THE RATE UNDER SCHEDULE 3A?

A. Under our proposal, non-dispatchable generators would be assessed an annual payment calculated as 4.01% of the generator's name plate capacity times $53,358.74 per MW.

Q. HOW WAS THE APPROPRIATE RATE LEVEL FOR SUCH SERVICE DETERMINED?

A. We performed a portfolio-wide study of the regulation service requirements for Westar's system. The study method and its results are addressed in my supplemental testimony filed in FERC Docket No. ER09-1273 on January 19, 2010.

Q. THANK YOU.