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Witness: Mark J. Peters
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MISSOURI PUBLIC SERVICE COMMISSION

FILE NO. ER-2014-0258

DIRECT TESTIMONY

OF

MARK J. PETERS

ON

BEHALF OF

UNION ELECTRIC COMPANY
d/b/a Ameren Missouri

St. Louis, Missouri
July, 2014

NP

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I. INTRODUCTION

Q. Please state your name and business address.

A. Mark J. Peters, Union Electric Company d/b/a Ameren Missouri ("Ameren Missouri" or "Company"), One Ameren Plaza, 1901 Chouteau Avenue, St. Louis, Missouri 63103.

Q. What is your position with Ameren Missouri?

A. I am Manager, Asset & Trading Optimization in the Corporate Planning Department.

Q. Please describe your educational background and employment experience.

A. I received a Bachelor of Arts degree in Liberal Arts & Sciences (Concentration in Economics) in August of 1985 from the University of Illinois (Urbana-Champaign). My current duties include supervision and guidance of the group responsible for developing fuel budgets, reviewing and updating economic dispatch parameters for the generating units owned by Ameren Missouri, providing power plant project justification studies, and performing other special studies.

I began employment with Illinois Power Company in August of 1985, holding a variety of roles prior to its acquisition by Ameren Corporation. Following Illinois Power's acquisition by Ameren Corporation, I was a member of the Strategic Initiatives

group of Ameren Services Company, concentrating on Ameren Corporation's Illinois utility subsidiaries' post-2006 energy supply acquisition process. In December of 2007, I accepted the position of Managing Supervisor – Asset & Trade Optimization in the Commercial Transactions section of Corporate Planning. In that role, I was initially responsible for the guidance and supervision of a group that provided analytical support to the Ameren Missouri trading group, which is managed by Ameren Missouri witness Jaime Haro. In December 2012, I added the duties noted in the beginning of this section.

II. PURPOSE AND SUMMARY OF TESTIMONY

Q. What is the purpose of your direct testimony in this proceeding?

A. The purpose of my direct testimony is to sponsor the determination of a normalized level of net fuel costs, which was used by Company witness Laura Moore in determining Ameren Missouri's revenue requirement for this case. Net fuel costs consist of nuclear fuel, coal, oil, and natural gas costs associated with producing electricity from the Ameren Missouri generation fleet, plus the variable component of net purchased power, less the energy revenues from net off-system sales.

Q. Please summarize your testimony and conclusions.

A. Ameren Missouri's normalized net fuel costs were calculated using the PROSYM production cost model.

The normalized annual net fuel costs are $673.7 million, which consists of fuel costs of $854.2 million and variable net purchase power costs of $34 million, offset by net off-system energy sales revenues of $214.5 million.

III. PRODUCTION COST MODELING

Q. What is a production cost model?

A. A production cost model is a computer application used to simulate an electric utility's generation system and load obligations. One of the primary uses of a production cost model is to develop production cost estimates used for planning and decision making, including the development of a normalized level of net fuel costs upon which a utility's revenue requirement can be based.

"Net fuel costs" as used in this testimony is a subset of the total fuel and net purchased power costs, including transportation and emissions costs and revenues, net of net off-system sales revenues, which comprise the Net Base Energy Cost or Factor (B) in the Company's Rider FAC tariffs. The Net Base Energy Cost is discussed in the direct testimony of Ameren Missouri witness Laura M. Moore.

Q. How long has PROSYM been used as a production cost model by Ameren Missouri?

A. It is my understanding that PROSYM has been used to model Ameren Missouri's system since 1995.

Q. How is PROSYM used by Ameren Missouri?

A. PROSYM is used by Ameren Missouri to model generation output. The results of this modeling are used for operational, financial and regulatory purposes. Model output provides information used in developing budgets and financial forecasts, fuel burn projections, emissions, and other generation station project analysis, and is used in the preparation and evidentiary support for various regulatory filings, such as Federal

Energy Regulatory Commission Public Utility Regulatory Policy Act ("PURPA") filings; and rate cases, such as this one.

Q. What are the major inputs to the PROSYM model run used for calculating a normalized level of net fuel costs?

A. The major inputs include: normalized hourly loads, unit operating characteristics, unit availabilities, prices for the primary variable cost components (fuel by type by plant, variable operating & maintenance costs, opportunity cost of emissions), and the market price of electrical energy.

Q. What are the major outputs of the PROSYM model run used for calculating a normalized level of net fuel costs?

A. The major outputs include: generation output by unit, expressed in megawatt-hours ("MWh"), millions of British thermal units ("MMbtu"), and the cost in dollars; net purchases, expressed in both MWh and dollars; and net off-system sales, expressed in both MWh and dollars.

Q. Please generally describe how net off-system sales and net purchases are determined by the model.

A. Ameren Missouri is a market participant within the Midcontinent Independent System Operator, Inc.'s ("MISO") markets. We purchase energy to serve our entire load from the MISO market and separately sell all of our generation output into the MISO market. For modeling purposes, however, we report only on a net basis as described below.

In any given period, the model dispatches generation that has dispatch costs below the hourly market price for power, presuming the unit is available for dispatch in

that period. In any period where Ameren Missouri has a load requirement in excess of available generation that has a dispatch cost below the hourly market price for power, the model will report a net purchase equal to the difference between load and economical generation. In any period where Ameren Missouri has a load requirement less than available generation that has a dispatch cost below the hourly market price for power, the model will report a net sale equal to the difference between load and economical generation.

IV. PRODUCTION COST MODEL INPUTS

Q. What load data assumptions were used in the PROSYM model run used for calculating a normalized level of net fuel costs?

A. Normalized hourly loads developed from the actual loads for the test year, April 1, 2013, through March 31, 2014, were used for this purpose. The normalized hourly loads reflect kilowatt-hour ("kWh") sales and distribution line losses.

Q. What operational data assumptions were used in the PROSYM model run used for calculating a normalized level of net fuel costs?

A. Operational data assumptions reflecting the characteristics of the generating units were used for this purpose, including: the unit input/output curve, which calculates the fuel input required for a given level of generator output; the unit minimum load, which is the lowest load level at which a unit normally operates including the average impact, if any, of providing regulating reserve service; the unit maximum load, which is the highest level at which the unit normally operates; ramp rates, which is a measurement of how quickly a specific generating unit can increase or decrease its output; minimum up and down times, which establish the minimum amount of time a unit

must remain on line when returning to service and the minimum amount of time it must remain offline when taken out of service, respectively; identification of the unit commit status, which indicates if the unit is "must run"; identification of specific fuel used for startup and generation, including the ratio of those fuels if more than one for a given unit; and fuel blending. Schedule MJP-1 lists the operational data used for this case.

Q. Have there been any significant changes to the operational data assumptions since the last rate case?

A. Yes, the following are significant changes since the last rate case:

a) The commit status for each generating unit at the Meramec Energy Center has been changed from must run, allowing the model to commit and de-commit the units; however, the unit minimum run time and minimum down time have been adjusted to limit the total number of starts on a given unit to no more than 30 in a given year to address concerns with negative consequences expected to arise from more frequent cycling of the units.

b) The O'Fallon Solar Energy Center has been added as a generation resource.

c) The fuel blend at the Sioux Energy Center has been changed to 100 percent Powder River Basin ("PRB") coal to reflect anticipated operations.

Each of these changes results in a reduction in Ameren Missouri's net fuel costs. The addition of the O'Fallon Solar Energy Center increases off-system sales revenue, while the change in the Meramec dispatch status and the Sioux fuel blend result in a reduction in fuel costs in excess of the decrease in off-system sales revenue resulting from reductions in unit output.

Q. What unit availability data assumptions were used in the PROSYM model run used for calculating a normalized level of net fuel costs?

A. Unit availability data assumptions were developed by unit to annualize planned outages, unplanned outages and de-ratings. Planned outages are major unit outages that occur at scheduled intervals. The length of the scheduled outage depends on the type of work being performed. Planned outage intervals vary due to factors such as: type of unit, unplanned outage rates during the maintenance interval, and plant modifications. A normalized planned outage length was used for this case, as reflected in Schedule MJP-2. The lengths of the planned outage assumptions are based on a 6-year average of actual planned outages that occurred between April 1, 2008, and March 31, 2014, with the exception of the assumption for the Callaway Energy Center, which was based on an annualized average of their four most recent refueling outages (Refuel 16 through Refuel 19).

In addition to the length of the planned outage, the time period when the planned outage occurs is also important. The planned outage schedule assumption used in modeling Ameren Missouri's generation with the PROSYM model in this proceeding is shown in Schedule MJP-3. This assumption was developed in consideration of historical practices and market prices, whereby such outages are generally scheduled in the spring and fall when the negative financial consequences of removing a unit from service are lower.

Unplanned outages are short outages when a unit is completely off-line. These outages typically last from one to seven days and occur between the planned outages. The unplanned outages, by definition are unforeseen events whose timing cannot be

predicted, and thus are modeled as random events. They are the result of operational problems that must be corrected for the unit to operate properly. The normalized unplanned outage rate assumption for this proceeding is based on a 6-year average of unplanned outages that occurred between April 1, 2008 through March 31, 2014, and is reflected in Schedule MJP-4.

A unit de-rate occurs when a generating unit cannot reach its maximum output due to operational problems. The magnitude of the de-rate varies based on the operating issues involved. As with the unplanned outage assumption, these are unforeseen events whose timing cannot be predicted, and thus are modeled as random events. The de-rate assumption used in this case is based on a 6-year average of de-rates that occurred between April 1, 2008, through March 31, 2014, and is reflected in Schedule MJP-5.

Q. What fuel data assumptions were used in the PROSYM model run used for calculating a normalized level of net fuel costs?

A. Ameren Missouri units burn four general types of fuel: nuclear fuel, coal, natural gas (including landfill gas), and oil. The specific fuels (and the applicable ratio of those fuels if more than one) used by each generating unit for both normal generation and unit startup are identified in the model, and an incremental and average cost assumption is developed for each. The incremental cost assumptions are used by the model in its dispatch logic – determining when and at what output level a specific unit should run. Average costs represent the accounting costs incurred for the fuel consumed by generation and are used to calculate the fuel cost for each generating unit.

The natural gas and oil price assumptions are based on the average daily spot market prices for the 36 month period ending December 31, 2014, using 27 months of

historical data and 9 months of forward prices for natural gas, and 28 months of historical data and 8 months of forward prices for oil. The nuclear fuel cost assumption is based on the average nuclear fuel cost associated with Callaway Refuel 20, which is scheduled to be completed in November 2014.

The incremental coal cost assumptions are based on the average spot market prices for the 36 month period ending December 31, 2014, using 29 months of historical data and 7 months of forward prices.

The average (accounting) coal cost assumptions reflect coal and transportation costs based upon coal and transportation prices that will be effective as of January 1, 2015.

We have not included a cost assumption for landfill gas as I have been advised that those costs represent RES compliance costs and are accounted for in the RES cost rebase operations and maintenance expense portion of the revenue requirement.

Q. What market price of energy assumptions were used in the PROSYM model run used for calculating a normalized level of net fuel costs?

A. The market price of energy assumption used in the model is the generation weighted average market prices for the period January 1, 2012, through December 31, 2014, described in Mr. Haro's testimony. These projected market prices will be replaced with actual generation weighted average market prices as part of the true-up process in this proceeding.

Q. Are there costs and revenues other than those established by the PROSYM production cost model which should be considered in the determination of net fuel costs?

A. Yes. There are other costs and revenues that should be considered in net fuel costs which are addressed in Mr. Haro's testimony.

Q. Please list the items that are modeled in PROSYM that should be trued-up using data as of the end of the anticipated true-up date in this case.

A. The following PROSYM input assumptions should be updated as of the applicable true-up date: Ameren Missouri's retail kWh sales and distribution line losses; coal, nuclear, natural gas, and oil costs; unit availabilities; energy prices and known and measurable changes to unit operating characteristics, if any.

Q. Does this complete your direct testimony?

A. Yes, it does.

SCHEDULES
MJP-1 through MJP-5
are HIGHLY CONFIDENTIAL IN THEIR ENTIRETY

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Increase Its Revenues for Electric Service.	)))	File No. ER-2014-0258

AFFIDAVIT OF MARK J. PETERS

STATE OF MISSOURI)
) ss
CITY OF ST. LOUIS)

Mark J. Peters, being first duly sworn on his oath, states:

1. My name is Mark J. Peters. I work in the City of St. Louis, Missouri, and I am employed by Union Electric Company d/b/a Ameren Missouri as Manager, Asset & Trading Optimization in the Corporate Planning department

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of Ameren Missouri consisting of 10 pages, and Schedules MJP-1 through MJP-5, all of which have been prepared in written form for introduction into evidence in the above-referenced docket.

3. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct.

Mark J. Peters

Subscribed and sworn to before me this 3rd day of July, 2014.

Notary Public

My commission expires:

Julie Irby - Notary Public
Notary Seal, State of
Missouri - St. Louis County
Commission #13753418
My Commission Expires 1/15/2017