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Witness:	Kevin DeGraw
Sponsoring Party:	Union Electric Company
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MISSOURI PUBLIC SERVICE COMMISSION

FILE NO. ER-2014-0258

DIRECT TESTIMONY

OF

KEVIN DEGRAW

ON

BEHALF OF

UNION ELECTRIC COMPANY
d/b/a AMEREN MISSOURI

St. Louis, Missouri
July, 2014

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DIRECT TESTIMONY

OF

KEVIN DEGRAW

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I. INTRODUCTION

Q. Please state your name, position, and business address.

A. My name is Kevin DeGraw. I am Vice President of Power Operations for Union Electric Company d/b/a Ameren Missouri ("Ameren Missouri" or "Company"). My office address is 1901 Chouteau Avenue, St. Louis, Missouri.

Q. What is your professional and academic background?

A. I joined Ameren in 2009 and served as Vice President of Enterprise Risk Management at Ameren Missouri. Prior to 2009, I worked at Northrop Grumman for twelve years as a Program Manager and a manager of manufacturing operations, where we built and overhauled nuclear-powered ships for the U.S. Navy. Prior to that, I worked in design engineering at Ford Motor Company, and I served in the U.S. Navy as a Surface Warfare Nuclear Propulsion Officer.

I received a Bachelor of Science degree in Mechanical Engineering from the State University of New York and a Masters of Business Administration degree from the University of Michigan.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to address the Company's decision to retire its oldest coal-fired power plant, the Meramec Energy Center ("Meramec") by 2022. I will also

address some issues we have had with our coal refining activity at the Labadie, Rush Island, and Sioux Energy Centers.

II. MERAMEC ENERGY CENTER

Q. Please describe Meramec.

A. Meramec is a four unit, coal-fired base load power plant whose first generating unit went online in 1953 and whose last generating unit went online in 1961. It is by far the Company's oldest and least efficient base load power plant, and is one of the older coal-fired power plants in the nation. Its low efficiency, relative to the Company's other coal-fired plants, is because of the technology available at the time it was built as well as the age of the plant. This is not unlike the efficiency of an older model car versus a much newer car. Meramec has served the Company and its customers very well over the past approximately 61 years, and we believe it can still provide service for a few more years, but, as I discuss below, it is clear that it is nearing the end of its useful life and that it will have to be retired by 2022.

Q. Please provide some background on the Company's decision to retire Meramec by 2022.

A. For many years we have believed that it was likely the plant would retire by 2022. The last time a full depreciation study was completed, our expert consultants, Black and Veatch, estimated that the life of Meramec would end in 2022. That estimate, and the depreciation study in which it was used, were prepared as of year-end 2008, and were filed in connection with the Company's 2009 rate case (File No. ER-2010-0036). However, a Missouri Industrial Energy Consumers ("MIEC") depreciation consultant argued in that case that since unit 4 at Meramec was at that time 47 years old, it was more reasonable to assume, for depreciation purposes, that the plant would not be retired until 2027. The Company disagreed at that time, but the Missouri

Public Service Commission ("Commission") chose to use the 2027 retirement date for the plant for depreciation purposes.

Since that time, we have continued to evaluate the viability of Meramec, from both an operational and economic standpoint. It has become apparent that both the capital and operational costs necessary to keep it running on a long-term basis would continue to increase to levels that, given its relatively lower efficiency, would negatively impact the economics of its operation as a base load plant and, eventually, its operation at all. Much of the expected capital costs are expected to be related to new environmental requirements.

Significantly, we also have experienced some equipment failures at Meramec that caused us to have concerns about our ability to operate the plant safely. In 2012, we had two failures in high energy pipes that could have resulted in severe injuries to employee(s) working in the area. Since its retirement date was last set for depreciation purposes, the plant has also run much less because the economics in the market (Meramec is, as noted, less efficient and has higher dispatch costs) have not supported dispatching it nearly as often as was the case historically.

In summary, it has become even clearer since 2009 that the plant will not continue to operate past 2022.

Q. You earlier mentioned safety issues and also the issue of age. Please explain further how those issues have impacted the retirement decision.

A. The Meramec plant was originally designed for a 40 year life. Excellent maintenance and operation practices have allowed the plant to operate safely well past 40 years, however, any equipment must eventually be replaced. As the plant has aged, we have started to see some component failures (or potential failures) that could create safety issues. We believe that plant economics currently support running the plant for several more years – to 2022 –but

even if a plant can be operated from the standpoint of economics, we need to be sure that it can be operated safely. Consequently, as part of our evaluation of Meramec's future, we engaged Burns and McDonnell to conduct a comprehensive assessment of key plant components. That effort began in September of 2013, and was completed with the delivery of their report on May 6, 2014. In summary, Burns and McDonnell determined that the plant could be safely operated through 2022 with certain capital investments and maintenance expense. The level of capital and maintenance expense predicted currently support economic operation until 2022 in Ameren Missouri's economic modeling. Ameren Missouri has an excellent piping and equipment inspection and monitoring process. The Burns and McDonnell study identified additional inspection routines that will need to be completed. However, it is expected that capital and maintenance requirements necessary in order to operate the plant past 2022 are much greater, and would not be economic.

Q. You also mentioned environmental requirements. How do your expectations regarding such requirements relate to the date on which you plan to close Meramec?

A. Ameren Missouri has been very proactive in making sure that it complies with the ever-increasing environmental requirements applicable to its generating plants. Based upon our best view of environmental requirements and what they would mean for our coal-fired power plants (including Meramec) over the next several years, we believe we can likely avoid having to make any significant capital investments in Meramec to comply with environmental requirements that would cause the plant to become uneconomic until about 2022. We have a difficult time seeing any scenario where Meramec could operate after 2022 without installing substantial pollution control equipment (likely a flue gas desulfurization unit, or "scrubber", at a minimum) at a cost of several hundred million dollars. It is readily apparent, without

complicated analyses, that an investment of that magnitude (that would have a life of at least 20 years) cannot be supported by the economics of the plant, both because of the magnitude of that one investment and because significant other investments would have to be made to address other plant components, some of which will, by then, be between 73 and 81 years old. At that point, shut-down is the best option for customers.

Q. When was the decision to retire Meramec by 2022 made?

A. Ameren Missouri's leadership, including its CEO, had significant discussions about Meramec in the latter part of 2013. At that time, the decision to retire Meramec was made contingent on receiving satisfactory results from the Burns and McDonnell condition assessment I mentioned earlier. By "satisfactory" I mean we needed reasonable assurance that the plant could continue to be operated safely without having to make significant investments that would in effect force shut-down of the plant now or in the near term. As I indicated earlier, we then engaged Burns and McDonnell to perform its study, with the final report delivered to us on May 6. Having satisfied the contingency, Ameren Missouri's leadership then discussed the results of the report and the decision was finalized in the past few weeks. Ameren Missouri's Board of Directors ratified the decision on June 26, 2014.

Q. You state that the Meramec plant will be retired by 2022. Is it possible that the plant may be retired before that?

A. That is possible. Ameren Missouri cannot know for sure what the impact of future environmental requirements may be. For example, Missouri's implementation of the greenhouse gas rules may require Meramec to be retired earlier. It is also possible that other environmental rules could have the same effect.

III. REFINED COAL

Q. Can you explain the coal refinement process at the Labadie, Sioux, and Rush Island Energy Centers?

A. Yes. Pursuant to certificates of convenience and necessity issued by the Commission, Ameren Missouri was authorized to sell coal at the Labadie, Sioux and, Rush Island Plants to coal refining companies, and lease space to those companies on the plant sites for them to conduct the refining process. These companies refine the coal they purchase by adding a chemical to reduce pollution and then re-selling the coal back to Ameren Missouri before it is burned in the plants. The refining companies receive tax credits to compensate them for their work. Ameren Missouri receives coal handling fees and lease payments from the coal refiners, which help offset its operations and maintenance ("O&M") expenses at the plants. In this rate case, the Company is including over $20 million of annual coal refinement payments as an off-set to its O&M costs.

Q. Has the coal refinement process caused any issues at the plants?

A. Yes. The refinement process creates bromic acid as a byproduct in the exhaust gas at the plants. The bromic acid has condensed causing corrosion on the air heater baskets at the plants and related equipment. This corrosion is expected to increase the operations and maintenance costs at the plants. This is an industry-wide problem for power plants utilizing this type of coal refining. Additionally, the refinement chemicals increase slagging rates in the boilers, requiring more frequent boiler cleaning operations.

Q. How much are O&M costs expected to increase as a result of this corrosion?

A. We expect that O&M costs will eventually increase by approximately $3.5 million per year. However, in the second half of 2014, we expect to spend an incremental

$1.2 million to address this problem. We have included an annualized pro forma amount of $2.4 million in incremental costs in our revenue requirement in this case. We propose to true-up that amount to reflect an annualization of the precise amount of incremental O&M costs that we actually incur in the second half of 2014.

Q. Does the corrosion problem suggest that coal refinement should be stopped at Ameren Missouri's plants?

A. Not at all. Coal refinement produces revenues in excess of $20 million that are far in excess of the incremental costs caused by the corrosion. In addition, the refinement process reduces pollution from our coal plants, which benefits our customers and the general public. The benefits of coal refinement far outweigh its costs.

Q. Does this conclude your direct testimony?

A. Yes, it does.

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.	)))	Case No. ER-2014-0258

AFFIDAVIT OF KEVIN DEGRAW

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

Kevin DeGraw, being first duly sworn on his oath, states:

1. My name is Kevin DeGraw. I work in the City of St. Louis, Missouri, and I am employed by Union Electric Company d/b/a Ameren Missouri as Vice President of Power Operations.

2. Attached hereto and made a part hereof for all purposes is my Direct Testimony on behalf of Union Electric Company d/b/a Ameren Missouri consisting of 7 pages and Schedule(s) N/A, 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.

Kevin DeGraw

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