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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**

UE Exhibit No. 11  
Date 3-12-15 Reporter KF  
File No. ER-2014-0258

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**DIRECT TESTIMONY**

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**I. INTRODUCTION**

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**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

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

3 **II. MERAMEC ENERGY CENTER**

4 **Q. Please describe Meramec.**

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

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

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

1 Public Service Commission (“Commission”) chose to use the 2027 retirement date for the plant  
2 for depreciation purposes.

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

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

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

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

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

1 even if a plant can be operated from the standpoint of economics, we need to be sure that it can  
2 be operated safely. Consequently, as part of our evaluation of Meramec's future, we engaged  
3 Burns and McDonnell to conduct a comprehensive assessment of key plant components. That  
4 effort began in September of 2013, and was completed with the delivery of their report on May  
5 6, 2014. In summary, Burns and McDonnell determined that the plant could be safely operated  
6 through 2022 with certain capital investments and maintenance expense. The level of capital and  
7 maintenance expense predicted currently support economic operation until 2022 in Ameren  
8 Missouri's economic modeling. Ameren Missouri has an excellent piping and equipment  
9 inspection and monitoring process. The Burns and McDonnell study identified additional  
10 inspection routines that will need to be completed. However, it is expected that capital and  
11 maintenance requirements necessary in order to operate the plant past 2022 are much greater,  
12 and would not be economic.

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

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

1 complicated analyses, that an investment of that magnitude (that would have a life of at least  
2 20 years) cannot be supported by the economics of the plant, both because of the magnitude of  
3 that one investment and because significant other investments would have to be made to address  
4 other plant components, some of which will, by then, be between 73 and 81 years old. At that  
5 point, shut-down is the best option for customers.

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

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

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

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

### III. REFINED COAL

1  
2 **Q. Can you explain the coal refinement process at the Labadie, Sioux, and Rush**  
3 **Island Energy Centers?**

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

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

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

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

22 A. We expect that O&M costs will eventually increase by approximately  
23 \$3.5 million per year. However, in the second half of 2014, we expect to spend an incremental



1 \$1.2 million to address this problem. We have included an annualized pro forma amount of  
2 \$2.4 million in incremental costs in our revenue requirement in this case. We propose to true-up  
3 that amount to reflect an annualization of the precise amount of incremental O&M costs that we  
4 actually incur in the second half of 2014.

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

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

11 **Q. Does this conclude your direct testimony?**

12 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 ) Case No. ER-2014-0258  
Increase Its Revenues for Electric Service. )

**AFFIDAVIT OF KEVIN DEGRAW**

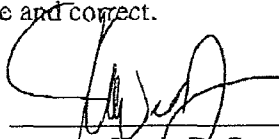
**STATE OF MISSOURI )**  
**) ss**  
**CITY OF ST. LOUIS )**

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

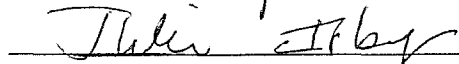
1. My name is Kevin DeGraw. I work in the City of St. Louis, Missouri, and I am employed by Union Electric Company d/b/a Ameren Missouri as Vice President of Power Operations.

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