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Considerations
Witness: Mark C. Birk
Sponsoring Party: Union Electric Company
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MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. EA-2012-_____

DIRECT TESTIMONY

OF

MARK C. BIRK

ON

BEHALF OF

**UNION ELECTRIC COMPANY
d/b/a AMEREN MISSOURI**

****DENOTES HIGHLY CONFIDENTIAL INFORMATION****

St. Louis, Missouri
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1 **DIRECT TESTIMONY**

2 **OF**

3 **MARK C. BIRK**

4 **CASE NO. EA-2012-_____**

5 **I. INTRODUCTION**

6 **Q. Please state your name and business address.**

7 A. My name is Mark C. Birk. My business address is One Ameren Plaza,
8 1901 Chouteau Avenue, St. Louis, Missouri 63103.

9 **Q. By whom and in what capacity are you employed?**

10 A. I am employed by Union Electric Company d/b/a Ameren Missouri
11 ("Company" or "Ameren Missouri") as Vice President of Power Operations.

12 **Q. Please describe your educational background and employment**
13 **experience.**

14 A. I received my Bachelor of Science degree in Electrical Engineering from
15 the University of Missouri-Rolla in 1986 and my Master of Science in Electrical
16 Engineering from the same institution in 1991. In 2009, I also received a Master of
17 Business Administration from Washington University in St. Louis. I am a licensed
18 professional engineer in the State of Missouri. I began my employment with Union
19 Electric Company in 1986 as an assistant engineer in the nuclear function. In 1989, I
20 transferred to Union Electric's Meramec Power Plant as an electrical engineer. In 1996, I
21 transferred to the Energy Supply Operations Group and became a Power Supply
22 Supervisor. I became Manager of Energy Supply Operations in the spring of 2000. I
23 became General Manager of Energy Delivery Technical Services in the fall of 2001 and

1 Vice President of that department in 2002. I became Vice President of Ameren Energy,
2 Inc., Ameren Corporation's short-term trading affiliate, in the fall of 2003 and assumed
3 my current position with Ameren Missouri as Vice President of Power Operations in
4 September of 2004.

5 **Q. Please summarize your duties and responsibilities as Vice President of**
6 **Power Operations for Ameren Missouri.**

7 A. I am responsible for all of the generation assets of Ameren Missouri,
8 except the Callaway Nuclear Plant. This includes responsibility for the Company's coal-
9 fired base load fleet, responsibility for the Company's intermediate and peaking
10 combustion turbine generating units, and responsibility for the Company's hydroelectric
11 plants. In addition to being chief safety officer for Ameren Missouri's non-nuclear
12 generation fleet, I am also responsible for the safe, reliable and efficient operation of the
13 plants, environmental compliance at the plants, and the design, construction management
14 and implementation of all plant-related projects.

15 **II. PURPOSE OF TESTIMONY**

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

17 A. The purpose of my testimony is to request approval of the Commission to
18 sell a portion of the Company's coal supply and lease a portion of its Rush Island Plant
19 site in connection with the purchase and use of refined coal at the Rush Island facility.
20 The use of refined coal will provide environmental and financial benefits to the Company
21 and its customers. In my testimony, I will provide an explanation of the refined coal
22 process and its impact on operations at the Rush Island Plant.

1 **Q. Please describe the Company's Rush Island Plant.**

2 A. The Rush Island Plant is a 1204 megawatt base load coal-fired generating
3 facility located in Jefferson County, Missouri.

4 **III. OVERVIEW OF REFINED COAL PROCESS**

5 **Q. Please provide an overview of the refined coal process.**

6 A. Refined coal is defined by the Internal Revenue Service ("IRS") Code as
7 coal that has been treated such that when burned to produce steam, generates at least a
8 20% reduction in nitrogen oxide ("NOx") emissions and at least a 40% reduction in either
9 sulfur dioxide ("SO₂") or mercury emissions. Refined coal provides significant tax
10 benefits to the owners of the refined coal facilities for the first 10 years of operation.

11 Buffington Partners, LLC ("BP"), an affiliate of Coal Emissions Reduction
12 Technologies, LLC ("CERT"), is a provider of refined coal with which the Company has
13 contracted to provide refined coal at the Rush Island Plant. BP uses the Chem-Mod
14 technology to produce refined coal, which consists of mixing additives with the coal to
15 achieve emissions reductions. While the contractual arrangements for refined coal are
16 complex and will be discussed in more detail by Ameren Missouri witness Robert Neff,
17 the primary benefit to Ameren Missouri and its customers is reduced operating costs.
18 Reduced operating costs will be realized through fees charged by Ameren Missouri to BP
19 for the leasing of a small amount of land for the facility, a license to access the facility
20 and other related handling services. Additional operating cost savings are expected
21 through reduced additive costs when the United States Environmental Protection
22 Agency's ("USEPA") Maximum Achievable Control Technology ("MACT") rule, which
23 is expected to require mercury reductions, takes effect.

1 **IV. REFINED COAL SELECTION & OPERATION**

2 **Q. What vender was selected for supply of refined coal products?**

3 **A. BP was selected as the supplier of refined coal at Rush Island. BP is one**
4 of several licensees of the Chem-Mod process in the U.S. Ameren Missouri reviewed
5 proposals from both BP and another Chem-Mod licensee, and made the determination
6 that BP was a better fit at Rush Island, primarily due to their system being less intrusive
7 on the existing plant coal handing equipment and because there was not sufficient lead
8 time available to install the more complex alternative system.

9 **Q. Were other Ameren Missouri coal-fired generating units considered**
10 **as candidates for using refined coal?**

11 **A. Yes. The Labadie and Meramec Plants were reviewed for the Chem-Mod**
12 process as they also use pulverized coal boilers. Both stations were ruled out due to the
13 risk of increased particulate loading on the Electrostatic Precipitators ("ESPs") which
14 could exceed the Prevention of Significant Deterioration ("PSD") limits of 25 tons
15 annually on a site basis. Particulate emissions, based on recent stack testing for the draft
16 USEPA MACT rule, are higher at Labadie and Meramec than at Rush Island.

17 Use of refined coal at the Sioux Plant is currently under negotiations with another
18 refined coal provider, Clean Coal Solutions, LLC ("CCS"). CCS uses a proprietary
19 process called CyClean which is only applicable to cyclone-fired generating units.
20 Should Ameren Missouri reach agreement with CCS for the Sioux Plant, a separate filing
21 will be made to seek the necessary approvals from the Commission.

1 Q. **What kind of equipment will be needed to process the refined coal?**

2 A. The equipment used to refine the coal includes (a) storage silos and
3 dispensing equipment for the dry additive application, (b) liquid storage tanks and
4 dispensing equipment for the liquid additive application, (c) mixing equipment for
5 mixing the additives with the raw coal, and (d) a trailer containing all electrical and
6 control equipment. This equipment will be located on the Rush Island Plant site.

7 All equipment and infrastructure will be funded, installed, owned and operated by
8 BP. Ameren Missouri is responsible (and compensated) for providing leased space at the
9 Rush Island Plant site, coal handling services of the coal feedstock and coal for BP to
10 refine. Ameren Missouri's responsibilities also include providing incidental utility hook-
11 ups for power and water as well as emergency services.

12 Q. **In the event the refined coal facility does not operate, will Ameren**
13 **Missouri be able to continue electric operations?**

14 A. Yes. In the event that BP's facility is out of service we will continue
15 operation as we do today. BP's structures will not interfere with delivery of coal to the
16 energy centers for electric generation.

17 Q. **The tax code requires lower NOx and either mercury or SO₂ emission**
18 **rates be demonstrated to qualify for tax credits. Please explain Ameren Missouri's**
19 **expectations for emissions performance with refined coal.**

20 A. BP has successfully completed testing using Rush Island coal feedstock in
21 a pilot scale combustion facility, demonstrating that the refined coal qualifies for tax
22 credits (the tax code allows the fuel to be qualified in an approved pilot scale test).

1 Ameren Missouri expects to improve mercury capture at the Rush Island Plant
2 with the use of the additive BP is providing. Although BP has met IRS testing
3 requirements with respect to NOx emissions reductions, Ameren Missouri is uncertain at
4 this time of the level of reductions in NOx emissions that will be achieved at the Rush
5 Island Plant.

6 **Q. Is Ameren Missouri responsible for demonstrating the lower**
7 **emissions rate?**

8 **A.** No, BP is responsible for demonstrating the required mercury and NOx
9 emission reductions are being achieved. Testing of the refined coal is required every
10 6 months or whenever the fuel is changed. BP bears 100% of the cost of emissions
11 reductions testing and 100% of the risk that the sorbents applied to the raw coal feedstock
12 in the facility will generate the required emissions reductions. Ameren Missouri has no
13 responsibilities or liabilities regarding the testing or the ultimate achievement of
14 emissions reductions.

15 BP plans to conduct off-site testing in a pilot scale combustion facility to prove
16 that the required mercury and NOx emission reductions could be achieved (pilot scale
17 tests are a permitted methodology in the tax code). The pilot scale testing will be
18 conducted at the pilot scale combustion facility at the University of North Dakota Energy
19 & Environmental Research ("EERC"), which is a well-known and well-respected third
20 party testing facility.

21 **Q. Are there operational benefits to burning refined coal? If so, please**
22 **describe.**

1 A. Yes. In addition to the emission benefits, BP believes operational benefits
2 associated with the Chem-Mod process include improved performance of fly ash as a
3 cement replacement in concrete mixes, reduced scale formation on boiler tubes, and
4 improved heat rate; however Ameren Missouri will not be able to quantify any such
5 potential benefits until the refined coal project is in full operation.

6 Q. **Are there significant operational risks associated with burning refined**
7 **coal?**

8 A. No, we do not believe there will be significant operational risks burning
9 refined coal but there are always some risks when implementing any new technology at a
10 power plant. Full scale testing of the Chem-Mod process is scheduled for late fall to
11 ensure that there will be no detrimental operational impacts.

12 Q. **What if the Company determines there are detrimental impacts to**
13 **using refined coal?**

14 A. The Company has the right to suspend refined coal usage if detrimental
15 impacts are observed. As discussed by Mr. Neff in his direct testimony, under the terms
16 of the Company's agreements with BP, the Company can suspend operation at any time
17 if in Ameren Missouri's sole judgment the refined coal causes operational problems.

18 Q. **Will Ameren Missouri be able to operate Rush Island using refined**
19 **coal under its current air operating permits?**

20 A. Ameren Missouri has received permission to conduct testing of the refined
21 coal from the Missouri Department of Natural Resources ("MDNR") Air Pollution
22 Control Program at the Rush Island Plant. BP has submitted an air permitting

1 applicability determination request to the MDNR asking confirmation that the project is
2 exempt from construction permitting due to *de minimis* emissions from the equipment.

3 Ameren Missouri will need to seek permission from the MDNR Air Pollution
4 Control Program to continue use of the refined coal after the test period has concluded.
5 However, since all pollutants are expected to have emissions below *de minimis* levels,
6 approval for continued use of refined coal is expected.

7 Q. Are there any other units in Missouri or other states burning refined
8 coal?

9 A. Yes, another refined coal provider, Clean Coal Solutions, LLC has four
10 operating units in Missouri using the Cyclean process, Thomas Hill 1 & 2 and New
11 Madrid 1 & 2, owned by Associated Electric Company, Inc. CCS has test programs in
12 place and is currently negotiating contracts with:

- 13 • ** _____
14 _____
15 • _____
16 • _____
17 • _____
18 • _____
19 • _____ **

20 Ameren Missouri is not aware of any units in operation which use refined coal
21 provided by CERT or its affiliates, but there are units in service using the Chem-Mod
22 process. CERT facilities planned to be in service by the end of the year include:

- 1 • ** _____
2 _____
- 3 • _____
- 4 • _____
- 5 _____
- 6 • _____
- 7 • _____
- 8 _____ **

9 We do not have a comprehensive list of other Chem-Mod licensees but are aware
10 of the following installations:

- 11 • Ameren Energy Resources: Duck Creek Plant
- 12 • DTE Energy: Monroe Power Plant, Belle River Power Plant, St. Clair
13 Power Plant

14 **Q. If refined coal is not used, what technologies would be required to**
15 **reduce emissions and at what cost?**

16 A. Currently, Ameren Missouri is assessing NOx reductions required to
17 achieve the recently issued Cross-State Air Pollution Rule ("CSAPR") allocations. At
18 this time, we are not able to quantify what NOx reductions will be achieved using refined
19 coal. As a consequence, at this time we have not accounted for any savings in the use of
20 refined coal for NOx emissions.

21 The proposed MACT rule requires reductions in mercury emissions from coal-
22 fired units. Our expectation is that the refined coal provided by BP will provide a

1 significant contribution toward achieving MACT limits for mercury by providing fuel
2 oxidizers.

3 Q. Will refined coal impact economics of the sale of fly ash?

4 A. Yes, due to the use of mercury capture additives, the fly ash will no longer
5 be marketable to the cement kilns and the impacts of this are currently under review. It
6 should be noted we expect that regardless of the use of refined coal, our fly ash is not
7 expected to be marketable in 2015 or 2016 due to the proposed MACT mercury capture
8 requirements.

9 Q. Can you provide any additional information regarding CERT's
10 technologies?

11 A. Yes. Included as Schedule MCB-1 is a copy of a presentation provided by
12 CERT to Ameren Missouri that provides additional information regarding their
13 technologies.

14 Q. Does this conclude your direct testimony?

15 A. Yes, it does.

Mary Hoyt - Notary Public
Notary Seal, State of
Missouri - Jefferson County
Commission #10397820
My Commission Expires 4/11/2014

Schedule MCB-1 is
Highly Confidential
in its entirety