AmerenUE
Callaway Plant

PO Box 620
Fulton, MO 65251

June 8, 2009

10 CFR 52.75

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
11555 Rockville Pike
Rockville, MD. 20852

ALNRC 00027

Subject: AmerenUE, Callaway Plant Unit 2 (NRC Docket No. 52-037)
Response to RAI No. 13 (eRAI 2497), Revision 0, SRP
Section 08.01 – Electric Power

Reference: Surinder Arora (NRC) to David E. Shafer (AmerenUE), "Final RAI No. 13 (eRAI 2497) - Public" email dated May 12, 2009.

The purpose of this letter is to respond to the Request for Additional Information (RAI) identified in the NRC e-mail correspondence to AmerenUE, dated May 12, 2009 (Reference). This RAI is associated with the Electric Power System as discussed in Section 8.1 of the Final Safety Analysis Report (FSAR), as submitted in Part 2 of the Callaway Plant Unit 2 Combined License Application (COLA).

Enclosure 1 provides our response to RAI No. 13 (eRAI 2497), Revision 0.

This response does not include any new regulatory commitments or contain proprietary information.

COLA impacts associated with the response to this RAI are noted in Enclosure 2.

If there are any questions regarding this transmittal, please contact me at (573) 676-8519, SBond2@ameren.com or Dave Shafer at (573) 676-4722, DShafer@ameren.com.

D079
NRO

I declare under penalty of perjury that the foregoing is true and correct.

Executed on June 8, 2009

Scott Bond

Scott M. Bond
Manager
Nuclear Generation Development

SMB/AML/slk

Enclosure:

1. Response to RAI No. 13 (eRAI 2497), Revision 0
2. Proposed COLA Changes Associated with the Response to RAI No. 13 (eRAI 2497)

cc:

Mr. Elmo E. Collins, Jr.
Regional Administrator
U.S. Nuclear Regulatory Commission
Region IV
612 E. Lamar Blvd., Suite 400
Arlington, TX 76011-4125

Senior Resident Inspector
Callaway Resident Office
U.S. Nuclear Regulatory Commission
8201 NRC Road
Steedman, MO 65077

Bruce Olson, P.E.
Environmental Project Manager
U.S. EPR Projects Branch
Division of New Reactor Licensing
Office of New Reactors
Bruce.Olson@nrc.gov

Surinder Arora, P.E.
Project Manager
U.S. EPR Projects Branch
Division of New Reactor Licensing
Office of New Reactors
Surinder.Arora@nrc.gov

Joseph Colaccino, Chief
U.S. EPR Projects Branch
Division of New Reactor Licensing
Office of New Reactors
Joseph.Colaccino@nrc.gov

Michael Miernicki
Senior Project Manager
U.S. EPR Projects Branch
Division of New Reactor Licensing
Office of New Reactors
Michael.Miernicki@nrc.gov

Project Team/Others Distribution List

RACC Members Distribution List

File code: A160.5761

Enclosure 1

Response to RAI No. 13 (eRAI 2497), Revision 0

Question 08.01-1

Callaway FSAR Sections 8.1.4.4 and 8.2.1.1 describe agreements and protocols that are in place between Callaway Unit 2 and the transmission system operator (TSO) to provide safe and reliable operation of the transmission system and equipment at Callaway Unit 2. However, a description of the communication procedures between the TSO and Callaway Unit 2, and the associated training and testing of operators and maintenance personnel as requested in GL 2006-02 questions 1(b), 1(c) and 1(d) are not provided in the COL application. Please provide the requested information and include it in a future revision of the FSAR.

Response

A description of the communications agreements and protocols in place between Callaway Plant Unit 2 and the transmission systems operator (TSO), and the Callaway Plant Unit 2 procedures and training will be added to FSAR Section 8.2.1.1 as shown in Enclosure 2, Proposed COLA Changes Associated with the Response to RAI No. 13 (eRAI 2683).

COLA Impact

COLA Part 2 FSAR, Section 8.2.1.1 will be revised as shown in Enclosure 2 during the next formal revision of the Callaway Plant Unit 2 COLA.

Enclosure 2

Proposed COLA Changes Associated with the Response to RAI No. 13 (eRAI 2497)

This arrangement provides two physically-separated offsite power sources to Callaway Plant comprised of five 345 kV circuits. The CAL-BLAN circuits and the CAL-LSCR circuit form one preferred offsite power source for the Callaway Plant, with the MTGY-CAL circuits forming the second. The nearest point between these two sources is where the Loose Creek and Montgomery lines attach to their respective switchyard termination structures. The distance between the centerline of these lines at this point is approximately 1550 ft (472 m). An overview of these transmission lines is provided in Figure 8.1-1.

The Callaway Plant Unit 2 switchyard is connected to the Callaway Plant Unit 1 switchyard by two 345 kV, 1800 MVA circuits routed on common steel towers. These circuits are approximately 1 mi (1.6 km) in length and are contained entirely on AmerenUE property.

Two physically independent circuits that minimize the likelihood of their simultaneous failure under operational and environmental conditions and postulated events are provided to Callaway Plant Unit 2 by the switchyard connecting circuits and the MTGY-CAL circuits. The nearest distance between a switchyard connecting circuit and a MTGY-CAL line is the point where they attach to the switchyard termination structures. The distance between the centerline of these lines at this point is approximately 250 ft (76 m).

Design details of the seven 345 kV circuits described above are given in the Table 8.2-1. Figure 8.2-1 depicts the 345 kV transmission line configurations.}

The U.S. EPR FSAR includes the following COL Item in Section 8.2.1.1:

> A COL applicant that references the U.S. EPR design certification will provide site-specific information regarding the communication agreements and protocols between the station and the transmission system operator, independent system operator, or reliability coordinator and authority. Additionally, the applicant will provide a description of the analysis tool used by the transmission operator to determine, in real time, the impact that the loss or unavailability of various transmission system elements will have on the condition of the transmission system to provide post-trip voltages at the switchyard. The information provided will be consistent with information requested in NRC generic letter 2006-02.

This COL Item is addressed as follows:

{The Callaway site lies within the service territory of AmerenUE. Midwest Independent System Operator (MISO) is the Transmission Provider and Reliability Coordinator for the region containing AmerenUE's service territory, and is responsible for the regional reliability coordination as defined in the NERC (North American Electric Reliability Corporation) and Regional Standards and applicable MISO Operating Manuals. AmerenUE operates its transmission facilities as a balancing authority under the direction and control of MISO. LBDCR 09-0182

Formal agreements are established between AmerenUE, MISO and Callaway Plant to provide reliable operation of the transmission system connected to Callaway Plant. These agreements establish requirements for transmission system parameters, operation, and analysis, as well as establishing protocols for communications between these entities.

As a part of these agreements ~~AmerenUE~~ Ameren Transmission Operations and MISO perform both seasonal (winter and summer) and real time grid analyses. The frequency and type of studies to be performed, as well as the required transmission system operation criteria are outlined in the agreements and are in accordance with Federal Energy Regulatory Commission (FERC) reliability standards, MISO and AmerenUE standards, regional practices and the Callaway Plant Transmission Owner Agreement. LBDCR 09-0182

The reliability of the AmerenUE system is continuously (real time) analyzed by both ~~AmerenUE~~ Ameren Transmission Operations and MISO. ~~AmerenUE~~ Ameren Transmission Operations uses power system analysis programs along with a state estimator to evaluate the strength of the transmission system and identify contingencies which could pose a threat to the system. This allows operators to react to strengthen the transmission system where needed. Operational planning studies are also performed using Power System State Estimation (PSSE) program, an offline power flow study tool. PSSE is used for analysis of near term operating conditions under varying load, generation, and transmission topology patterns.

The agreements between AmerenUE, MISO and Callaway Plant also establish protocols for communications so that Callaway Plant remains cognizant of grid vulnerabilities to make informed decisions regarding reliability and operability of the offsite power supply. Callaway Plant reviews the transmission system parameters and informs ~~AmerenUE~~ Ameren Transmission Operations prior to initiating any plant activities that may affect grid reliability. In addition, plant operators inform ~~AmerenUE~~ Ameren Transmission Operations of changes in generation ramp rates and notify them of any developing problems that may impact generation. ~~AmerenUE~~ Ameren Transmission Operations then conveys any pertinent information to MISO.

Initial planning of the addition of a large generating unit such as Callaway Plant Unit 2 requires completion of the MISO Large Generator Interconnection Procedure (Large Generator Interconnect Agreement MISO). Studies performed as part of this procedure evaluate the transmission system to MISO and AmerenUE standards. The study identifies any transmission system modifications required to accommodate the additional generating unit (combined turbine-generator-exciter) and the main step-up transformers including modifications to substations and switchyards.~~}~~

The agreement between MISO, AmerenUE, and the Callaway Plant establishes the basis for procedures that support the reliability and safety of the Callaway Plant. In conjunction with, and as referred to in, that document, is a generic protocol document, "Midwest ISO Real-Time Operations-Communication and Mitigation Protocols for Nuclear Plant/Electric System Interfaces," RTO-OP-03, which is used to guide or govern communication between Midwest ISO, Ameren Transmission Operations, and Callaway Plant.

For Callaway Plant and per the agreement/protocol described above, Ameren Transmission Operations and/or MISO are required to notify the Callaway Plant whenever an impaired or potentially degraded grid condition is recognized by Ameren Transmission Operations and/or MISO. Specific examples of conditions identified in the agreement include the following:

1. MISO will monitor the appropriate system conditions and notify Callaway Plant via Ameren Transmission Operations when operating conditions are outside of established limits, defined as the Category 8 Alarm, as well as when they are restored to within acceptable criteria.

2. Ameren Transmission Operations will immediately notify Callaway Plant of an actual violation to the operating criteria affecting Callaway Plant.

3. MISO or Ameren Transmission Operations will immediately notify Callaway Plant upon verification that study results indicate a post-contingent violation of operating criteria not mitigated within 15 minutes.

Callaway Plant notifies Ameren Transmission Operations (who in turn notifies MISO as necessary) for the following conditions and/or activities:

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1. Changes to switchyard voltage, switchyard breaker alignment, or main generator VAR loading. Notification of such changes is performed in accordance with applicable Callaway Plant procedures which govern switchyard maintenance, power reduction in support of maintenance, or isolation of devices for maintenance.

2. Changes in Callaway Plant post-trip offsite power loading. Notification of such changes is performed in accordance with certain Operations Alarm Response Procedures.

3. Changes in status of Callaway Plant offsite power voltage regulating devices (such as Load Tap Changers in manual mode versus automatic mode). Operating procedures governing the manipulation of these devices require communication with the Ameren Transmission Operations several days before any planned manual operation.

Operators will receive classroom and simulator training on recognition of grid conditions, selecting the appropriate procedure for response, and procedure usage as part of the standard operator training program. Knowledge gained in this training will be tested by written quizzes and evaluated simulator scenarios.}

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8.2.1.2 Station Switchyard

The U.S. EPR FSAR includes the following COL Item in Section 8.2.1.2:

A COL applicant that references the U.S. EPR design certification will provide site-specific information for the switchyard layout design.

This COL Item is addressed as follows:

{The 345 kV air insulated switchyard for Callaway Plant Unit 2 has been designed and is sized and configured along with the existing Callaway Plant Unit 1 switchyard to accommodate the output of both Callaway Units 1 and 2. The location of this switchyard is on the Callaway site approximately 350 ft (107 m) southwest of Callaway Plant Unit 2 and 700 ft (213 m) to the northwest of the existing Callaway Plant Unit 1 345 kV switchyard. The two 345 kV switchyards are interconnected by overhead lines and transmit electrical power output from Callaway Plant to the AmerenUE transmission system. The Callaway Plant Unit 2 switchyard layout and location are shown on Figure 8.2-1.

A schematic of the Callaway Plant Unit 2 switchyard layout design, which incorporates a breaker and a half scheme, is presented in Figure 8.2-2. Circuit breakers are rated in accordance with IEEE Standard C37.06 (IEEE, 2000). Circuit breakers are equipped with dual trip coils. The 345 kV circuit breakers in the switchyard are rated according to the following criteria.

- Circuit breaker continuous current ratings are chosen such that no single contingency in the switchyard (e.g., a breaker being out for maintenance) will result in a load exceeding 100% of the nameplate continuous current rating of the breaker.

- Interrupting duties are specified such that no fault occurring on the system while operating in steady-state conditions will exceed the breaker's nameplate interrupting capability.

- Short Time ratings are specified such that no fault occurring on the system while operating in steady-state conditions will exceed the switch's nameplate short time rating.