



Callaway Plant

December 28, 2017

ULNRC-06406

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555-0001

Ladies and Gentlemen:

**DOCKET NUMBER 50-483  
CALLAWAY PLANT UNIT 1  
UNION ELECTRIC CO.  
RENEWED FACILITY OPERATING LICENSE NPF-30  
SPECIAL REPORT 2017-03: INOPERABILITY OF A POST ACCIDENT MONITORING  
(PAM) INSTRUMENT**

References:

- 1) Ameren Missouri letter ULNRC-06362, "Special Report 2017-01 (PAM Report): Inoperability of a Post Accident Monitoring (PAM) Instrument," dated April 4, 2017
- 2) Ameren Missouri letter ULNRC-06368, "Supplement to Special Report 2017-01 (PAM Report): Inoperability of a Post-Accident Monitoring (PAM) Instruments," dated April 27, 2017

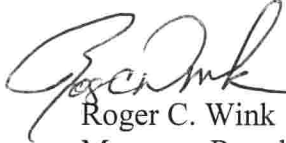
Enclosed Special Report 2017-03 addresses inoperability of the Containment Radiation Level (High Range) instrumentation at Callaway Plant. These instruments were previously addressed in Special Report 2017-01, as submitted per Ameren Missouri letters dated April 4, 2017 and April 27, 2017 (References 1 and 2 above). The instruments remain inoperable and are not able to meet range requirements specified in the Final Safety Analysis Report (FSAR) and Regulatory Guide 1.97.

This correspondence does not contain new commitments. None of the material in this letter or the enclosed report is considered proprietary.

ULNRC-06406  
December 28, 2017  
Page 2 of 4

If there are any questions, please contact Mr. Thomas Elwood, Regulatory Affairs and Licensing Supervisor, at 314-225-1905.

Sincerely,

 PIN 6581  
Roger C. Wink  
Manager, Regulatory Affairs

Enclosure: Special Report 2017-03

cc: Mr. Kriss M. Kennedy  
Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region IV  
1600 East Lamar Boulevard  
Arlington, TX 76011-4511

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

Mr. L. John Klos  
Project Manager, Callaway Plant  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Mail Stop O8H4  
Washington, DC 20555-0001

**Index and send hardcopy to QA File A160.0761**

**Hardcopy:**

Certrec Corporation  
6100 Western Place, Suite 1050  
Fort Worth, TX 76107  
(Certrec receives ALL attachments as long as they are non-safeguards and may be publicly disclosed.)

**Electronic distribution for the following can be made via Other Situations ULNRC Distribution:**

F. M. Diya  
B. L. Cox  
S. P. Banker  
R. C. Wink  
T. B. Elwood  
Corporate Communications  
NSRB Secretary  
STARS Regulatory Affairs  
Mr. Jay Silberg (Pillsbury Winthrop Shaw Pittman LLP)  
Missouri Public Service Commission

## **SPECIAL REPORT 2017-03**

### **Requirement**

Callaway Plant Unit 1 Technical Specification (TS) 3.3.3, "Post Accident Monitoring (PAM) Instrumentation," contains requirements for the Containment Radiation Level (High Range) instrumentation. TS 3.3.3 Limiting Condition for Operation (LCO) requires two Containment Radiation Level (High Range) instrumentation channels to be Operable during Modes 1, 2, and 3. With both of the required Containment Radiation Level (High Range) instruments inoperable, Required Action C.1 specifies, "Restore all but one channel to OPERABLE status," with a specified Completion Time of 7 days. With both of the required Containment Radiation Level instrumentation channels inoperable for more than 7 days, Required Action F.1 applies, which specifies, "Initiate action in accordance with Specification 5.6.8."<sup>1</sup>

Specification 5.6.8, "PAM Report," states, "When a report is required by Condition B or F of LCO 3.3.3, 'Post Accident Monitoring (PAM) Instrumentation,' a report shall be submitted within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status."

### **Background**

On April 4, 2017 Ameren Missouri submitted letter ULNRC-06362, "Special Report 2017-01 (PAM Report): Inoperability of a Post Accident Monitoring (PAM) Instrument," as supplemented by Ameren Missouri letter ULNRC-06368, "Supplement to Special Report 2017-01 (PAM Report): Inoperability of a Post-Accident Monitoring (PAM) Instruments," dated April 27, 2017. Special Report 2017-01 identified that the Containment Radiation Level (High Range) instrumentation, GTRE0059 and GTRE0060, were declared inoperable on March 6, 2017 in response to industry operating experience concerning the potential for degraded instrument performance during loss-of-coolant accident (LOCA) conditions due to thermally induced current (TIC) and/or moisture intrusion into the coaxial Amphenol (N) style connector for this instrumentation from water permeating the Rockbestos RSS-6-104/LE coaxial cable jacket.

While subsequently developing a plant modification to replace the Containment Radiation Level (High Range) coax cables, it was identified that the equipment does not meet (and never has met) the range requirements specified in the FSAR and Regulatory Guide 1.97. The design/performance criterion for the two instruments is to detect radiation levels in the containment over a range of 1 rad/hr to 10E7 rad/hr.

During the recent refueling outage at Callaway (from October 7 to December 19, 2017) the original cables (Rockbestos) were replaced with new cables (Brand Rex) per the planned modification so that the potential effects of TIC would be minimized. It was discovered, however, that the new cables installed do not reduce the TIC effect enough to make GTRE0059 and GTRE0060 conform to the range requirements. The instruments are therefore still considered to be inoperable.

---

1. It should be noted that Required Action A.1 under TS 3.3.3 also applies with a Containment Radiation Level channel inoperable. It specifies, "Restore required channel to OPERABLE status," with a Completion Time of 30 days. With that Required Action and Completion time not met, Required Action B.1 applies, and it also requires initiating action "in accordance with Specification 5.6.8."

### **Preplanned Alternate Method of Monitoring**

An alternate means of monitoring, as described in the Bases for TS 3.3.3 Required Action F.1, is available as directed by plant procedure HTP-ZZ-07010, "Alternate Method for Obtaining CHARMS Readings." The procedurally directed alternate method uses portable survey instruments which would be used to measure radiation levels at pre-determined locations external to the Reactor Building. Correlations are provided to determine a Containment radiation level based on the external survey results.

### **Cause of the Inoperability and Basis for Special Report**

As reported in Special Report 2017-01 and as noted above, both channels of the Containment Radiation Level (High Range) instrumentation were declared inoperable on March 16, 2017 due to the potentially adverse effects of TIC and/or water permeation of the Rockbestos coaxial cable jacket during accident conditions. The Rockbestos coaxial cables were subsequently replaced with Brand Rex cables during the recent refueling outage, which eliminated the water permeation concerns. However, as noted above, the new cables are still susceptible to TIC effects to the extent that the instruments continue to be unable to meet the required range criteria.

It should be noted that after commencing the refueling outage at Callaway on October 7, 2017, TS 3.3.3 no longer applied once Mode 4 was reached. (As noted previously, the Applicability for TS 3.3.3 is Modes 1, 2 and 3.) Thus, the inoperability of the Containment Radiation Level (High Range) instrumentation, i.e., the applicable Conditions and Required Actions under TS 3.3.3, were no longer required to be tracked. During the outage, the above-noted cable replacement was completed. At the same time, the noted instrument range issue was identified.

On December 4, 2017, the Applicability of TS 3.3.3 was re-entered (when the plant reached Mode 3) during plant startup. This triggered re-entry into the applicable Conditions and Required Actions of TS 3.3.3 due to the determination that the Containment Radiation Level (High Range) instrumentation channels were still inoperable in light of the nonconformance to the range requirements of Regulatory Guide 1.97. In keeping with the requirements of the Required Actions under TS 3.3.3 and the reporting requirement of TS 5.6.8 (as described above), and in light of the new information and/or modified cause for inoperability of the Containment Radiation Level (High Range) instrumentation, it was determined that a new Special Report is required, i.e., Special Report 2017-03.

### **Plans and Schedule for Restoring the Instrumentation Channel to OPERABLE status**

As noted above, the Containment Radiation Level (High Range) instrumentation and cables are located inside the Containment Building and were recently replaced with the best cables available for the application. Callaway Plant is still working on a final resolution to address the potential TIC effects and the associated nonconformance with the FSAR-described design.