



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION IV  
1600 E. LAMAR BLVD.  
ARLINGTON, TX 76011-4511

August 1, 2016

Mr. Fadi Diya, Senior Vice President  
and Chief Nuclear Officer  
Union Electric Company  
P.O. Box 620  
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT, UNIT 1– NRC EVALUATIONS OF CHANGES, TESTS, AND  
EXPERIMENTS AND PERMANENT PLANT MODIFICATIONS BASELINE  
INSPECTION REPORT 05000483/2016007

Dear Mr. Diya:

On June 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Callaway Plant, Unit 1. On June 30, 2016, the NRC inspectors discussed the results of this inspection with T. Hermann, Site Vice President, and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

The NRC inspectors did not identify any findings or violations of more than minor significance.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Thomas R. Farnholtz, Chief  
Engineering Branch 1  
Division of Reactor Safety

Docket No. 50-483  
License No. NPF-30

Enclosure:  
Inspection Report 05000483/2016007  
w/Attachment: Supplemental Information

cc: Electronic Distribution

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket(s): 50-483  
License(s): NPF-30  
Report(s): 05000483/2016007  
Licensee: Union Electric Company  
Facility: Callaway Plant, Unit 1  
Location: Junction Highway CC and Highway O  
Steedman, MO  
Dates: June 13 to June 30, 2016  
Inspectors: G. George, Senior Reactor Inspector, Engineering Branch 1, Lead  
W. Smith, Reactor Inspector, Engineering Branch 1  
J. Watkins, Reactor Inspector, Engineering Branch 2  
Approved By: Thomas R. Farnholtz  
Chief, Engineering Branch 1  
Division of Reactor Safety

Enclosure

## SUMMARY OF FINDINGS

IR 05000483; 06/13/2016 – 06/30/2016; Callaway Energy Center; Evaluations of Changes, Tests, and Experiments and Permanent Plant Modifications.

This report covers a two-week announced baseline inspection on evaluations of changes, tests, and experiments and permanent plant modifications. The inspection was conducted by Region IV based engineering inspectors. No findings of more-than-minor significance were identified. The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Cross-cutting aspects were determined using IMC 0310, "Aspects Within the Cross-Cutting Areas." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated July 9, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5, dated February 2014.

**A. NRC-Identified Findings and Self-Revealed Findings**

No findings of more-than-minor significance were identified.

**B. Licensee-Identified Violations**

No findings of more-than-minor significance were identified.

## REPORT DETAILS

### 1. REACTOR SAFETY

#### Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

#### 1R17 Evaluations of Changes, Tests, and Experiments and Permanent Plant Modifications (71111.17T)

##### .1 Evaluations of Changes, Tests, and Experiments

##### a. Inspection Scope

The inspectors reviewed 5 evaluations performed pursuant to Title 10, Code of Federal Regulations (CFR), Part 50, Section 59, to determine whether the evaluations were adequate and that prior NRC approval was obtained as appropriate. The inspectors also reviewed 25 screenings, where licensee personnel had determined that a 10 CFR 50.59 evaluation was not necessary. The inspectors reviewed these documents to determine if:

- the changes, tests, and experiments performed were evaluated in accordance with 10 CFR 50.59 and that sufficient documentation existed to confirm that a license amendment was not required;
- the safety issue requiring the change, tests and experiment was resolved;
- the licensee conclusions for evaluations of changes, tests, and experiments were correct and consistent with 10 CFR 50.59; and
- the design and licensing basis documentation was updated to reflect the change.

The inspectors used, in part, Nuclear Energy Institute (NEI) 96-07, "Guidelines for 10 CFR 50.59 Implementation," Revision 1, to determine acceptability of the completed evaluations and screenings. The NEI document was endorsed by the NRC in Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," dated November 2000. The list of evaluations, screenings, and/or applicability determinations reviewed by the inspectors is included as an attachment to this report.

This inspection constituted 5 samples of evaluations and 25 samples of screenings and/or applicability determinations as defined in Inspection Procedure (IP) 71111.17-04. The minimum sample size for 10 CFR 50.59 evaluations was not met because the minimum number of evaluations since the previous triennial inspection were not available at the time of the inspection.

b. Findings

No findings were identified.

.2 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed 11 permanent plant modifications that had been installed in the plant during the last three years. The modifications were selected based upon risk significance, safety significance, and complexity. The inspectors reviewed the modifications selected to determine if:

- the supporting design and licensing basis documentation was updated;
- the changes were in accordance with the specified design requirements;
- the procedures and training plans affected by the modification have been adequately updated;
- the test documentation as required by the applicable test programs has been updated; and
- post-modification testing adequately verified system operability and/or functionality.

The inspectors also used applicable industry standards to evaluate acceptability of the modifications. The list of modifications and other documents reviewed by the inspectors is included as an attachment to this report.

This inspection constituted 11 permanent plant modification samples as defined in Inspection Procedure 71111.17-04.

.2.1 Replacement of Safety-Related Current/Pneumatic Transducers

The inspectors reviewed Replacement Item Equivalency 14-0055, implemented to replace current/pneumatic transducers used to control position of safety-related atmospheric steam dump valves and turbine-drive auxiliary feedwater flow control valves. The previous Masoneilan current/pneumatic transducers were replaced with Thermo-Fisher Scientific current/pneumatic transducers. The Masoneilan transducers were highly susceptible to hysteresis and large magnitude drift. This engineering replacement involved the seismic qualification and testing of the Thermo-Fisher Scientific transducer. The replacement item equivalency also modified existing instrumentation tubing associated with the replacement transducers. The inspectors did not identify any more-than-minor concerns with the design change package.

## .2.2 Commercial Grade Replacement of Diesel Crankcase Pressure Switch

The inspectors reviewed Commercial Grade Dedication 0422-1, implemented to replace obsolete United Electric J300-440 pressure switches with United Electric J400-440 pressure switches. The licensee completed a commercial grade dedication evaluation to evaluate the critical characteristics associated with the safety functions of the pressure switches to maintain crankcase pressure boundary and maintain continuity of the safety-related circuit. The inspectors reviewed the critical characteristic evaluation and operational tests of the new pressure switches. The inspectors did not identify any concerns with the design change package.

## .2.3 Modification to Seismically Analyze Fire Protection Pipe in the Fuel Building

The inspectors reviewed Replacement Item Equivalency 15-001, implemented to seismically analyze existing fire protection pipe in the fuel building and determine if additional seismic supports were necessary. The licensee had identified, in Callaway Action Request 201405221, that a section of the fire protection pipe in the fuel building was not seismically supported as reflected in drawings; therefore, the assumed pipe break in an internal flooding calculation was potentially non-conservative. To correct the condition, the licensee seismically analyzed the unsupported sections fire protection piping in accordance with ASME Boiler and Pressure Vessel Code Section III, 1974 Edition, 1975 Summer Addenda, piping design criteria. The inspectors did not identify any concerns with the design change package.

## .2.4 Revise Overcurrent Protection in the Containment Penetrations for Motor Operated Valves

The inspectors reviewed Modification Package 15-009, implemented to install additional cabling for motor operated valves going through containment electrical penetration assemblies for component cooling water containment isolation valve EGHV0062 and EJHV8811A, and containment recirculation sump isolation valves EJHV8811BA and EJHV8811B. This modification was necessary to ensure that the instantaneous breaker settings associated with these valves would protect the electrical penetration conductors throughout the entire penetration time-current damage curve. This modification revised the wiring going through the containment penetration by adding an additional power conductor to increase the ampacity of the associated circuits. Additionally, the upper trip tolerance acceptance criteria for the associated breakers were changed and the breakers were retested within the new tolerances. The inspectors did not identify any concerns with the design change package.

## .2.5 Hardened Condensate Storage Tank

The inspectors reviewed Modification Package 13-0033 which installed a hardened condensate storage tank to meet NRC Order EA-12-049. The NRC order was issued for beyond design basis external events, and required licensees to use a condensate storage tank as the first alternative to normal and makeup water sources. The existing condensate storage tank was not sufficiently protected from external events, so a

hardened condensate storage tank was added and tied into the auxiliary feedwater system. The inspectors reviewed the connections to the safety-related auxiliary feedwater system and the construction and operation of the tank. Specifically, the inspectors reviewed the isolation valves, check valves, level setpoints for swapover logic, the nitrogen sparge system, and any affects to the net positive suction head for the safety-related pumps. The inspectors did not identify any concerns with the design change package.

#### .2.6 Replacement Component Cooling Water Pump Oil Bearings and Oil Sight Glasses

The inspectors reviewed Modification Package 04-1021 which installed new pump bearing covers to prevent oil leakage from the shaft of the pumps and to install oil sight glasses that provided better indication of oil level on component cooling water pumps PEG01A, PEG01B, PEG01C, and PEG01D. The existing bearing seals on the component cooling water pumps allowed oil leakage through the bearing housing, which would challenge the operability of the system. Additionally, the constant level oilers were repositioned with oil level sight glasses so that the oil level in component cooling water pumps could be determined by operators. The inspectors did not identify any concerns with the design change package.

#### .2.7 Replacement Drain Valves on Control Room and Class 1E Air Conditioning Units

The inspectors reviewed Modification Package 13-0005 that replaced the oil drain plugs with valves for the control room air conditioning units SGK04A and SGK04B and Class 1E air conditioning units SGK05A and SGK05B. The control room air conditioning unit SGK04B was replaced in March 2013 and the licensee discovered that the replacement unit had an oil drain valve instead of an oil drain plug as specified by the design documentation. For improved maintenance purposes, the licensee changed the design of the oil drain plugs to allow for oil drain valves on SGK04A, SGK04A, SGK05A, and SGK05B. The addition of an oil drain valve allowed for maintenance to be performed without draining the entire oil reservoir and also shortened the maintenance duration because the valve did not require a wait time for the thread sealant chemicals on the fitted connection to the drain to cure. The inspectors did not identify any concerns with the design change package.

#### .2.8 Isolate Containment Air Cooler Coil

The inspectors reviewed Modification Package 08-0055, implemented to isolate the supply and return lines for train B containment cooler coil SGN01BR3. Specifically, the modification installed blind flanges to isolate essential service water flow to and from containment cooler coil tube bundle SGN01BR3, located on the right bank and third from the top of the containment air cooler SGB01B. Cooler coil SGN01BR3 was isolated because of excessive leakage in the tube bundles, and was replaced with a new bundle and put back into service in a subsequent refueling outage. During the period with the cooler coil tube bundle out of service, the heat removal capacity of the containment coolers was diminished, but adequate to perform its safety function. The inspectors did not identify any concerns with the design change package.

## .2.9 Evaluate Lower Amperage Fuses for Various 14 AWG Control Circuits in Main Control Room

The inspectors reviewed Modification Package 05-3029, implemented to evaluate inadequately protected cables which are in circuits from multiple fire areas which culminate into main control room. This modification would eliminate the possibility of secondary fires as described in Sections B3.3 and B3.4 of NFPA 805. Each circuit was investigated to determine if the current fuse rating adequately protected the associated control cable conductors. Evaluated fuses that did not provide adequate protection of the conductors were replaced with lower amperage fuses that do provide the necessary cable protection without interfering with the normal operation of the equipment. Where circuits were found that the fuse rating could not be reduced, additional fuse blocks and lower rated fuses were installed for the specific affected cables. The inspectors reviewed the calculations, a sample of the affected circuits' wiring diagrams and schematics for the new fuses to verify the installation met the requirements of the modification and was in accordance with the design. The inspectors did not identify any concerns with the design change package.

## .2.10 Main Transformer Replacement

The inspectors reviewed Modification Package 09-0074, implemented to replace the four main generator step-up transformers. Three in-service transformers, one per phase, and one spare transformer were replaced along with all associated controls, cooling, and monitoring equipment. The transformers were replaced due to the existing transformers reaching their end of life as evidenced by increasing levels of combustible gases being produced by the transformers. A bushing monitoring and an online 8-gas dissolved gas analyzer system were installed on the new transformers to improve monitoring of the generator step-up transformers. In addition, the existing fire deluge system was replaced with a perimeter-style (horseshoe shaped) system. This was modified to reduce the probability of the fire protection piping surrounding the transformers from damage, in the event of a catastrophic transformer failure. Existing oil containment structures were evaluated to ensure that the additional oil could still be contained. The concrete support structure for the spare transformer was modified to accommodate the additional weight of the new transformers. The inspectors reviewed the procurement specifications, removal and installation instructions, and walked down the installation of the new transformers and new horse-shoe-shaped deluge fire protection system to verify the installation met the requirements of the modification and was in accordance with the design. The inspectors did not identify any concerns with the design change package.

## .2.11 Replace the Ametek Iso-Limiter Transformers XPN07 & XPN08

The inspectors reviewed Modification Package 09-0051, implemented to replace the existing ferroresonant transformers that normally supply power to non-safety instrument alternating current busses PN07 and PN08. The existing transformers generated large amounts of heat which caused frequent failures and made them prone to catch fire. The transformers created vibrations which contributed to the failures of the equipment. As a result of these reliability issues, these transformers required frequent replacement and



have been replaced nearly 30 times over the life of the plant. These transformers have been replaced with improved design models, which consists of a single three-phase transformer with a different core material that does not generate the excessive heat and noise. The inspectors reviewed the wiring diagrams and schematics for the new transformers, walked down the installation of the new transformers, verified the post modification noise and heat levels of the replaced transformers, and verified the installation was in accordance with the design. The inspectors did not identify any concerns with the design change package.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

**4OA2 Problem Identification and Resolution**

.1 Review of Corrective Action Program Documents

a. Inspection Scope

The inspectors reviewed five corrective action program documents that identified or were related to 10 CFR 50.59 program and permanent plant modifications. The inspectors reviewed these documents to evaluate the effectiveness of corrective actions related to permanent plant modifications and evaluations of changes, tests, and experiments. In addition, corrective action documents written on issues identified during the inspection were reviewed to verify adequate problem identification and incorporation of the problems into the corrective action system. The list of specific corrective action documents that were sampled and reviewed by the inspectors are listed in the attachment to this report.

b. Findings

No findings were identified.

**4OA6 Meetings**

.1 Exit Meeting Summary

On June 30, 2016, the inspectors presented the preliminary inspection results to Mr. T. Herrmann, Site Vice President, and other members of the licensee's staff. The licensee acknowledged the results as presented. No proprietary information was reviewed during this inspection or included in this report.

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

S. Abel, Director, Engineering Projects  
T. Becker, Supervising Engineer, Engineering – FIN  
J. Bruemmer, System Engineer, Engineering Programs  
C. Cash, Design Engineer, Engineering Design  
S. Chou, Design Engineer, Engineering Design  
M. Covey, Operations Manager, Operations  
T. Herrmann, Site Vice President  
L. Eitel, Supervisor, Engineering Design  
T. Elwood, Supervising Engineer, Regulatory Affairs and Licensing  
D. Epperson, Supervising Engineer, Engineering Design  
M. Haag, Principal Design Engineer, Engineering Design  
D. Hecker, System Engineer, Engineering Programs  
B. Jungmann, Director, Maintenance  
S. Kovaleski, Director, Engineering Design  
S. McLaughlin, Manager, Performance Improvement  
K. Mills, Director, Engineering Programs  
K. Norman, Design Engineer, Engineering Design  
E. Olson, Director, Engineering Programs  
S. Petze, Engineer, Regulatory Affairs  
G. Sellmayer, Supervising Engineer, Engineering Design  
P. Shirgur, Design Engineer, Engineering Design  
E. Smith, Supervisor, Nuclear Oversight Services  
S. Taylor, Design Engineer, Engineering Design  
D. Waller, Supervising Engineer, Major Projects

#### **NRC Personnel**

T. Hartman – Senior Resident Inspector  
M. Langelier – Resident Inspector

### **LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED**

None

## LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather, that selected sections of portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

### Applicability Determinations

| <u>Number</u> | <u>Description or Title</u>   | <u>Revision<br/>Date</u> |
|---------------|---|--------------------------|
| EDP-ZZ-01113  | Electrical Equipment Predictive Performance Manual  | 9                        |
| LDCN 13-0017  | Revise Containment Post-Accident Heat Removal Rate  | October 8,<br>2013       |
| MP 05-3029    | Evaluate Lower Amperage Fuses for Various 14AWG Control Circuits in the Main Control Room | 0                        |
| MP 09-0044    | Main Transformers Replacement   | 000.7                    |
| MP 09-0051    | Replace the Amtek Iso-Limiter Transformers XPN07 and XPN08                                | 000.2                    |
| MP 13-0033    | Hardened Condensate Storage Tank Refuel 21 Tie-ins  | April 29, 2016           |
| MP 13-0046    | Non-Safeguards Security Modifications for the ISFSI Project                               | 2                        |
| MP 14-0013    | East Intake Underground Cable Replacement   | 0                        |
| MP 15-0025    | Replacement of Supernatant Level Tree   | August 26,<br>2015       |
| MP 16-0003    | Enhancements to Modified Cask Handling Crane  | 0                        |
| MP 16-0006    | Reactor Vessel Cavity Walkway   | 0                        |
| MP 99-1047    | Emergency Diesel Generator Excitation System Controls Replacement                         | 000.1                    |
| OSP-SA-2413A  | Train A Diesel Generator and Sequencer Testing  | 23                       |
| OTA-RK-00016  | Annunciator Response Procedure MCB Panel RK016  | 0                        |
| OTN-MD-00001  | Switchyard Breakers and Disconnects   | 28                       |
| OTN-PA-00003  | Operating 12.47 Through 13.8 KV Disconnect Switches                                       | 1                        |
| RFR 200503034 | Roofing System Design and Installation Requirements                                       | June 1, 2005             |

10 CFR 50.59 Screenings

| <u>Number</u>          | <u>Description or Title</u>  | <u>Revision<br/>Date</u> |
|------------------------|--|--------------------------|
| CA2511-00922           | MP 13-0029 Isophase Bus Duct Backdraft Damper Design Improvement                             | 000.2                    |
| CA2511-00931           | MP 12-0017 LDCN 13-0014 Cycle 20 Core Reload Design  | 001                      |
| CA2511-00974           | MP 14-0019 Increase HKE04 Trolley Motor Breaker Setting                                      | 000                      |
| CA2511-01103           | MP15-005 LTC Dehydrating Breathers on ESF Transformers are Obsolete                          | 000                      |
| ECA-0.0                | Loss of All AC Power   | 23                       |
| EDP-ZZ-01113           | Electrical Equipment Predictive Performance Manual   | 9                        |
| MP 05-3029             | Evaluate Lower Amperage Fuses for Various 14AWG Control Circuits in the Main Control Room    | 0                        |
| MP 09-0044             | Main Transformers Replacement  | 000.7                    |
| MP 09-0051             | Replace the Amtek Iso-Limiter Transformers XPN07 and XPN08                                   | 000.4                    |
| MP 13-0033             | Hardened Condensate Storage Tank Refuel 21 Tie-ins   | April 29, 2016           |
| MP 13-0046             | Non-Safeguards Security Modifications for the ISFSI Project                                  | 2                        |
| MP 14-0013             | East Intake Underground Cable Replacement  | 0                        |
| MP 15-0019             | Revise Overcurrent Protection in the Containment Penetrations for EGHV0062, EJHV8811 A and B | 000                      |
| MP 15-0025             | Replacement of Supernatant Level Tree  | August 26, 2015          |
| MP 16-0003             | Enhancements to Modified Cask Handling Crane   | 0                        |
| MP 16-0006             | Reactor Vessel Cavity Walkway  | 0                        |
| MP 99-1047             | Emergency Diesel Generator Excitation System Controls Replacement                            | 000.1                    |
| OTA-RK-00016           | Annunciator Response Procedure MCB Panel RK016   | 0                        |
| OTA-RK-00016<br>ADD19E | NB01 Bus Degraded Voltage  | 1                        |
| OTA-RK-00016<br>ADD22E | NB02 Bus Degraded Voltage  | 1                        |

### 10 CFR 50.59 Screenings

| <u>Number</u> | <u>Description or Title</u>   | <u>Revision Date</u> |
|---------------|---|----------------------|
| OTN-MD-00001  | Switchyard Breakers and Disconnects   | 28                   |
| RFR 200503034 | Roofing System Design and Installation Requirements   | June 1, 2005         |
| RFR201200449  | Provide a qualified replacement for the ASD/TDAFW Discharge Valve Current-Pneumatic Transducers | August 27, 2014      |
| RFR20140543   | Prepare a Modification to Seismically Analyze FP Pipe in FB                                     | 0                    |

### 10 CFR 50.59 Evaluations

| <u>Number</u> | <u>Description or Title</u>   | <u>Revision</u> |
|---------------|---|-----------------|
| 13-05         | Pressurizer Pressure Uncertainty Change   | 0               |
| 13-06         | Reduction in the required level of Containment Cooler performance credited in Callaway's current licensing bases (LDCN 13-0017) | 0               |
| 14-01         | MP 99-1047, Emergency Diesel Generator Exciter modification   | 000.1           |
| 14-02         | Gen III shutdown seals for RCPs   | 0               |
| 16-05         | MP 13-0033, Hardened Condensate Storage Tank  | 0               |

### Permanent Plant Modifications

| <u>Number</u> | <u>Description or Title</u>   | <u>Revision</u> |
|---------------|---|-----------------|
| MP 04-1021    | CCW Pump Bearing Isolators and Oilers   | 1A              |
| MP 05-3029    | Evaluate Lower Amperage Fuses for Various 14AWG Control Circuits in the Main Control Room | 000.10          |
| MP 08-0055    | Isolate Containment Cooler Coil SGN01A  | Rev. 3          |
| MP 09-0044    | Main Transformers Replacement   | 000.7           |
| MP 09-0051    | Replace the Amtek Iso-Limiter Transformers XPN07 and XPN08                                | 000.4           |
| MP 13-0005    | Evaluate and Approve the use of Drain Valves on SGK04A/B and SGK05A/B                     | 0               |
| MP 13-0033    | Hardened Condensate Storage Tank Refuel 21 Tie-ins  | 4               |

Permanent Plant Modifications

| <u>Number</u> | <u>Description or Title</u>   | <u>Revision</u> |
|---------------|---|-----------------|
| MP 15-0019    | Revise Overcurrent Protection in the Containment Penetrations for EGHV0062, EJHV8811A and B | 0               |
| RFR 21095     | Approve Equivalent Pressure Switch  | A               |
| RIE 14-0055   | Replacement IP Transducer   | 0               |
| RIE 15-001    | Prepare a Modification to Seismically Analyze FP Pipe in the FB                             | 0               |

Corrective Action Program Documents (Reviewed)

|           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|
| 201305444 | 201309139 | 201403369 | 201409192 | 201502838 |
|-----------|-----------|-----------|-----------|-----------|

Corrective Action Program Documents (Issued)

|           |           |           |           |
|-----------|-----------|-----------|-----------|
| 201605704 | 201605721 | 201605722 | 201605865 |
| 201605961 | 201605970 | 201605969 |           |

Calculations

| <u>Number</u> | <u>Description or Title</u>   | <u>Revision / Date</u> |
|---------------|---|------------------------|
| 81402-J-001   | HCST Supply Valve ALHV0220 Opening Setpoint   | 0                      |
| ARC-1091      | Pipe Stress Analysis of As-built KC Piping Model P-298B                                   | 0                      |
| EA-A-06       | EGHV0062 New Penetration Ampacity and Breaker Setting and EJHV881 IA/B Penetration Rerate | 6, Add 18              |
| EA-A-06       | Short Circuit Protection of Containment Electrical Penetration Assemblies                 | 6, Add 3               |
| EG-53         | Stress Analysis for the CCW Pump Oiler and Sight Glass Configuration                      | October 20, 2010       |
| EQCN-13-01    | Equipment Qualification Change Notice   | October 10, 2013       |
| GK-33         | Seismic Analysis for SGK04 and SGK05 Oil Drain Valves                                     | April 1, 2013          |
| NG-12         | EGHV0062 New Penetration Ampacity and Breaker Setting                                     | 3, Add 25              |
| NG-23         | EJHV8811A and B New Penetration Ampacity and Breaker Tolerance                            | 0, Add 1               |

### Calculations

| <u>Number</u> | <u>Description or Title</u>   | <u>Revision / Date</u> |
|---------------|---|------------------------|
| ZZ-443        | Small Break LOCA Containment Pressure-Temperature Analysis                          | October 4, 2006        |
| ZZ-525        | Replacement Steam Generator LOCA and MSLB Containment Pressure Temperature Analysis | 1                      |
| ZZ-540        | DC Load Calculations for Maximum Current Flow Across 14 AWG Wire                    | 0                      |

### Procedures

| <u>Number</u>       | <u>Description or Title</u>  | <u>Revision</u> |
|---------------------|--|-----------------|
| OTA-KJ-00121-ADD6F  | High Crankcase Pressure  | 0               |
| EDP-ZZ-04015        | Evaluating and Processing Requests for Resolution  | 70              |
| APA-ZZ-00323        | Configuration Management Process   | 16              |
| APA-ZZ-00143        | 10 CFR 50.59 and 10 CFR 72.48 Reviews  | 16              |
| WEP-ZZ-00001        | Commercial Grade Evaluation  | 14              |
| EDP-ZZ-04054        | Conduct of Equipment Seismic Qualification Activities  | 6               |
| MPE-ZZ-QS009        | Testing of Molded Case Circuit Breakers, Starters, Overload Relays and Ground Fault Relaying | 31              |
| ECA 0.0             | Loss of All AC Power   | 23              |
| OSP-SA-2413A        | Train A Diesel Generator and Sequencer Testing   | 23              |
| OTA-RK-00016 ADD19E | NB01 Bus Degraded Voltage  | 1               |
| OTA-RK-00016 ADD22E | NB02 Bus Degraded Voltage  | 1               |
| OTA-RK-00016        | Annunciator Response Procedure MCB Panel RK016   | 0               |
| EDP-ZZ-01113        | Electrical Equipment Predictive Performance Manual   | 9               |
| OTN-MD-00001        | Switchyard Breakers and Disconnects  | 28              |
| OTN-PA-00003        | Operating 12.47 Through 13.8KV Disconnect Switches   | 1               |
| APA-ZZ-00600        | Design Change Control  | 57              |

## Drawings

| <u>Number</u> | <u>Description or Title</u>   | <u>Revision</u> |
|---------------|---|-----------------|
| 8618-X-94080  | One Line Diagram Metering and Relaying 345KV Differential and 345KV Bus-A and Bus-B Potential Devices | 15              |
| 8618-X-94081  | One Line Diagram Metering and Relaying Power Block to Switchyard Circuits                             | 11              |
| E-035-00080   | Electrical Penetration Assembly Termination List NO-8   | 6               |
| E-1058-00001  | Class 1 E 22.5 KVA Regulating Transformer Outline Diagram   | 0               |
| E-1058-00002  | Class 1 E 22.5 KVA Regulating Transformer Schematic Diagram   | 0               |
| E-1058-00004  | Class 1 E 22.5 KVA Regulating Transformer Component List  | 0               |
| E-1058-00005  | Seismic Testing Report for 22.5 KVA Regulating Transformer  | 0               |
| E-21001       | Main Single Line Diagram (FSAR Figure 8.3-1 Sheet 1)  | 25              |
| E-21PN01      | Instrument AC Power (Non-Class 1E Power System)   | 4               |
| E-23EG10      | Containment Isolation Valve Return from Thermal Barrier Cooling Coil                                  | 11              |
| E-23PN01      | Non-Class 1E Instrument AC Three-Line Meter and Relay Diagram   | 25              |
| M-22AL01(Q)   | Piping and Instrumentation Diagram Auxiliary Feedwater System   | 46              |
| M-22BG05      | Piping and Instrumentation Diagram Chemical and Volume Control System                                 | 25              |
| M-22BG05      | Piping and Instrumentation Diagram Chemical and Volume Control System                                 | 28              |
| M-22EJ01      | Piping and Instrumentation Diagram Residual Heat Removal System                                       | 59              |
| M-22EJ01      | Piping and Instrumentation Diagram Residual Heat Removal System                                       | 62              |
| M-22EM02      | Piping and Instrumentation Diagram High Pressure Coolant Injection System                             | 20              |
| M-22EM02      | Piping and Instrumentation Diagram High Pressure Coolant Injection System                             | 23              |



Drawings

| <u>Number</u>              | <u>Description or Title</u>                               | <u>Revision</u> |
|----------------------------|---|-----------------|
| MP13-0033-M-23AL01-013-002 | Piping Isometric Auxiliary Feedwater Pumps Suction Piping | 13              |

Miscellaneous

| <u>Number</u>          | <u>Description or Title</u>  | <u>Revision</u><br><u>Date</u> |
|------------------------|--|--------------------------------|
| CA 2687- MP 15-0019    | Post Change Test Plan. Revise Overcurrent Protection in the Containment Penetrations for EGHV0062, EJHV8811A and B | 0                              |
| CG 00422-1             | Commercial Grade Evaluation, Switch, Pressure, J400-440  | June 27, 2013                  |
| J-601B-00074           | Fischer Scientific Std5000 & Std6000 Current To Pressure Transducers   | 48                             |
| J-601B-00074, Tab 0054 | Fisher Scientific STD5000 & STD6000 Current to Pressure Transducers  | 48                             |
| PQL 00422              | Parts Q List, Switch, Pressure, J400-440   | June 6, 2013                   |
| QR-065-351021043       | Qualification Report for Current to Pressure Transducer Thermo Scientific P/N: STD6131-2                           | 1                              |
| VP-351021043-1         | NLI Verification Plan: Transducer, Current to Pressure, 4-20mA input, 3-15 PSIG output, 20 PSIG supply, Jack Plug  | 0                              |

Procedure Review Forms

| <u>Number</u>          | <u>Title</u>  | <u>Revision</u> |
|------------------------|---|-----------------|
| OSP-SA-2413A           | Train A Diesel Generator and Sequencer Testing      | 23              |
| OTN-PA-00003           | Operating 12.47 Through 13.8 KV disconnect Switches | 1               |
| OTA-RK-00016<br>ADD19E | NB01 Bus Degraded Voltage                           | 1               |
| OTA-RK-00016<br>ADD22E | NB02 Bus Degraded Voltage                           | 1               |
| OTA-RK-00016           | Annunciator Response Procedure MCB Panel RK016      | 0               |

August 1, 2016

Mr. Fadi Diya, Senior Vice President  
and Chief Nuclear Officer  
Union Electric Company  
P.O. Box 620  
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT, UNIT 1 – NRC EVALUATIONS OF CHANGES, TESTS, AND  
EXPERIMENTS AND PERMANENT PLANT MODIFICATIONS BASELINE  
INSPECTION REPORT 05000483/2016007

Dear Mr. Diya:

On June 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Callaway Plant, Unit 1. On June 30, 2016, the NRC inspectors discussed the results of this inspection with Mr. T. Hermann, Site Vice President, and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

The NRC inspectors did not identify any findings or violations of more than minor significance.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Thomas R. Farnholtz, Chief  
Engineering Branch 1  
Division of Reactor Safety

Docket No. 50-483  
License No. NPF-30

Enclosure:  
Inspection Report 05000483/2016007  
w/Attachment: Supplemental Information

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|---|---|---------------|---|-------------|---|-------------|---------------------|
| <input checked="" type="checkbox"/> SUNSI Review<br>by: GGeorge | ADAMS:<br><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |               | <input checked="" type="checkbox"/> Non-Sensitive<br><input type="checkbox"/> Sensitive |             | <input checked="" type="checkbox"/> Publicly Available<br><input type="checkbox"/> Non-Publicly Available |             | Keyword:<br>NRC-002 |
| OFFICE  | R4:RI/DRS   | R4:RI/DRS     | R4:SRI/DRS  | R4:C/EB1    | R4:C/PBB  | R4:C/EB1    |                     |
| NAME  | WCSmith   | JWatkins      | GGeorge   | TFarnholtz  | NTaylor   | TFarnholtz  |                     |
| SIGNATURE   | <i>E-mail</i>   | <i>E-mail</i> | <i>/RA/</i>   | <i>/RA/</i> | <i>/RA/</i>   | <i>/RA/</i> |                     |
| DATE  | 7/26/16   | 7/26/16       | 7/15/16   | 8/1/16      | 7/30/16   | 8/1/16      |                     |

OFFICIAL RECORD COPY

Letter to Fadi Diya from Thomas R. Farnholtz, dated August 1, 2016

SUBJECT: CALLAWAY PLANT, UNIT 1 – NRC EVALUATIONS OF CHANGES, TESTS, AND  
EXPERIMENTS AND PERMANENT PLANT MODIFICATIONS BASELINE  
INSPECTION REPORT 05000483/2016007

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