UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

May 3, 2018

Mr. Fadi Diya, Senior Vice President
and Chief Nuclear Officer
Ameren Missouri
Callaway Plant
P. O. Box 620
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT - NRC INTEGRATED INSPECTION REPORT 05000483/2018001

Dear Mr. Diya:

On March 31, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Callaway Plant. On April 4, 2018, the NRC inspectors discussed the results of this inspection with Mr. Tim Herrmann, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement; and the NRC resident inspector at the Callaway Plant.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; and the NRC resident inspector at the Callaway Plant.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Nicholas H. Taylor, Branch Chief
Project Branch B
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000483/2018001
w/Attachment 1: Supplemental Information
Attachment 2: Request for Information

U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Number:	05000483
License Number:	NPF-30
Report Number:	05000483/2018001
Enterprise Identifier:	I-2018-001-0006
Licensee:	Union Electric Company
Facility:	Callaway Plant
Location:	8315 County Road 459 Steedman, MO 65077
Inspection Dates:	January 1, 2018, to March 31, 2018
Inspectors:	D. Bradley, Senior Resident Inspector S. Janicki, Resident Inspector S. Alferink, Reactor Inspector D. Dodson, Senior Resident Inspector R. Kopriva, Senior Reactor Inspector S. Makor, Reactor Inspector J. Melfi, Project Engineer
Approved By:	N. Taylor Chief, Project Branch B Division of Reactor Projects

Enclosure

SUMMARY

The NRC continued monitoring licensee's performance by conducting an integrated inspection at the Callaway Plant in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to https://www.nrc.gov/reactors/operating/oversight.html for more information. NRC-identified and self-revealed findings, violations, and additional items are summarized in the tables below. A NRC-identified non-cited violation is documented in report section 71111.11.

List of Findings and Violations

Failure to Maintain Emergency Operating Procedures			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000483/2018001-01 Closed	[H.3] - Human Performance, Change Management	71111.11—Licensed Operator Performance
The inspectors identified a Green, non-cited violation of Technical Specification 5.4.1.a, "Procedures," for the licensee's failure to maintain emergency operating procedures for aligning auxiliary feedwater suction sources. Specifically, the licensee added continuous action steps to emergency operating procedures that placed both motor-driven auxiliary feedwater pumps in pull-to-lock and isolated their associated recirculation lines after depleting the two non-safety-related suction sources. These actions cause two of the three safety-related auxiliary feedwater pumps to be rendered inoperable prior to aligning the safety-related suction source of essential service water which is credited in accident analysis.			

Additional Tracking Items

Type	Issue number	Title	Report Section	Status
URI	05000483/2016001-01	Possible Incorrect Screening of the Spent Fuel Pool Decay Heat Removal Key Safety Function	71111.05AQ	Closed
LER	05000483/2013-009-00	Appendix R Unanalyzed Condition - Direct Current Ammeter Circuits Without Overcurrent Protection	71153	Closed
LER	05000483/2014-004-00	Postulated Hot Short Fire Event that Could Adversely Impact Shutdown Equipment	71153	Closed
LER	05000483/2017-001-00 05000483/2017-001-01	Violation of Technical Specification 3.7.9 Due to Ultimate Heat Sink Cooling Tower Train Inoperability	71153	Closed

LER	05000483/2017-002-01	Inadequate Protection from Tornado Missiles Identified due to Nonconforming Design	71153	Closed
LER	05000483/2017-003-00	Violation of Technical Specification 3.6.3, Containment Isolation Check Valve Found in Open Position	71153	Closed
NOV	05000483/2017007-01	Not Verifying the Operation and Timing of the Engineered Safety Feature Transformer XNB01 Load Tap Changer	92702	Closed

PLANT STATUS

Callaway Plant began the inspection period at full power. On March 14, 2018, the licensee reduced power to 45 percent to replace a reactor coolant system flow transmitter, commenced ascending in power upon completion of testing, and returned to full power on the same day. The licensee remained at this power level through the end of the inspection period.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed plant status activities described in IMC 2515 Appendix D, "Plant Status," and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Impending Severe Weather (1 Sample)

The inspectors evaluated readiness for impending adverse weather conditions for:

(1) Severe winter weather on January 11, 2018

71111.04 - Equipment Alignment

Partial Walkdown (3 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

(1) Component cooling water train B on January 10, 2018
(2) Control room filtration unit FGK02B on January 25, 2018
(3) Battery charger NK26 on February 7, 2018

Complete Walkdown (1 Sample)

The inspectors evaluated system configurations during a complete walkdown of:

(1) Instrument AC power (NN) system on January 18, 2018

71111.05AQ - Fire Protection Annual/Quarterly

Quarterly Inspection (5 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

(1) Control building 2016' elevation, fire area C-15 on January 12, 2018

(2) Auxiliary feedwater pipe chase 1988' elevation, fire area A-1 on February 16, 2018

(3) Control room air conditioning and filtration units, fire areas A-21 and A-22 on March 6, 2018

(4) Electrical penetration rooms, fire areas A-17 and A-18 on March 11, 2018

(5) Intake structure, fire area IS-1 on March 28, 2018

71111.06 - Flood Protection Measures

Internal Flooding (1 Sample)

The inspectors evaluated internal flooding mitigation protection:

(1) Control building 2016' elevation on January 9, 2018

71111.07 – Heat Sink Performance

Heat Sink (1 Sample)

The inspectors evaluated:

(1) Emergency diesel generator jacket water heat exchanger train A on March 22, 2018

71111.11 - Licensed Operator Requalification Program and Licensed Operator Performance

Operator Requalification (1 Sample)

The inspectors observed and evaluated simulator training for operating crews:

(1) Electrical faults on February 6, 2018

Operator Performance (1 Sample)

The inspectors observed and evaluated:

(1) Surveillance testing for the auxiliary feedwater system on February 20, 2018

(2) Surveillance testing for the emergency diesel generator train B and reactor coolant flow transmitter troubleshooting on March 7, 2018

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness (2 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

(1) 125 VDC system (NK) on January 17, 2018

(2) Instrument AC power system (NN) on February 14, 2018

71111.13 - Maintenance Risk Assessments and Emergent Work Control (5 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

(1) Elevated risk actions due to planned centrifugal charging pump B and component cooling water equipment outage on January 30, 2018

(2) Elevated risk actions due to planned switchyard maintenance on February 5, 2018

(3) Elevated risk actions due to planned safety injection train A equipment outage on February 13, 2018

(4) Emergent risk actions due to auxiliary feedwater pump door failure on February 20, 2018

(5) Elevated risk actions due to planned turbine-driven auxiliary feedwater pump equipment outage on February 27, 2018

71111.15 - Operability Determinations and Functionality Assessments (5 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

(1) Rising level trend in safety injection accumulators on January 8, 2018

(2) Reactor building service air header supply containment isolation valve KAV0118 out of position on January 15, 2018

(3) Battery charger NK25 equalize potentiometer failure on January 16, 2018

(4) Spent fuel pool calculation assumptions on February 13, 2018

(5) Turbine-driven auxiliary feedwater pump room door DSK13311 failure on March 2, 2018

71111.18 - Plant Modifications (1 Sample)

The inspectors evaluated the following permanent modification:

(1) MP 12-0020 electrical tie-ins for FLEX on March 29, 2018

71111.19 - Post Maintenance Testing (5 Samples)

The inspectors evaluated the following post maintenance tests:

(1) Control room air conditioning unit SGK04B equipment outage on January 10, 2018

(2) Class 1E battery charger NK25 equipment outage on January 22, 2018

(3) Class 1E battery charger NK21 equipment outage on January 29, 2018

(4) Turbine-driven auxiliary feedwater pump equipment outage on February 28, 2018

(5) Emergency diesel generator and essential service water train A equipment outage on March 23, 2018

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Routine (1 Sample)

(1) OSP-NE-0001A, standby diesel generator A periodic tests on January 24, 2018

In-service (2 Samples)

(1) OSP-BG-P005A, centrifugal charging pump A inservice test – Group B on February 15, 2018

(2) OSP-EG-P01BD, component cooling water train B pump and valve inservice test - group A on March 29, 2018

Containment Isolation Valve (1 Sample)

(1) OSP-KC-LL067, containment isolation valve leak rate test and results of check valve internal inspection under Condition Report 201706233 on March 15, 2018

71114.06—Drill Evaluation

Emergency Planning Drill (1 Sample)

The inspectors evaluated the radiological emergency response plan drill:

(1) Team 4 on March 8, 2018

Drill/Training Evolution (1 Sample)

The inspectors evaluated annual emergency response organization training evolution:

(1) Team 4 on February 1, 2018

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification (3 Samples)

The inspectors verified licensee performance indicators submittals listed below:

(1) MS06: Emergency AC Power Systems (01/01/2017-12/31/2017)

(2) MS10: Cooling Water Support Systems (01/01/2017-12/31/2017)

(3) BI01: Reactor Coolant System (RCS) Specific Activity Sample (01/01/2017-12/31/2017)

71152 - Problem Identification and Resolution

Annual Follow-up of Selected Issues (2 Samples)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

(1) Safety injection pump oil leak, Condition Report 201704706

(2) Ultimate heat sink cooling tower shroud bolting, Condition Report 201010236

71153 - Follow-up of Events and Notices of Enforcement Discretion

Licensee Event Reports (5 Samples)

The inspectors evaluated the following licensee event reports which can be accessed at https://lersearch.inl.gov/LERSearchCriteria.aspx:

(1) Licensee Event Report 05000483/2013-009-00, Appendix R Unanalyzed Condition - Direct Current Ammeter Circuits Without Overcurrent Protection, on October 9, 2013

(2) Licensee Event Report 05000483/2014-004-00, Postulated Hot Short Fire Event that Could Adversely Impact Shutdown Equipment, on September 19, 2014

(3) Licensee Event Reports 05000483/2017-001-00 and 05000483/2017-001-01, Violation of Technical Specification 3.7.9 Due to Ultimate Heat Sink (UHS) Cooling Tower Train Inoperability, on June 16, 2017

(4) Licensee Event Report 05000483/2017-002-01, Inadequate Protection from Tornado Missiles Identified due to Nonconforming Design, on August 15, 2017

(5) Licensee Event Report 05000483/2017-003-00, Violation of Technical Specification 3.6.3, Containment Isolation Check Valve Found in Open Position, on October 31, 2017

92702 - Followup on Traditional Enforcement Actions Including Violations, Deviations, Confirmatory Action Letters, Confirmatory Orders, and Alternative Dispute Resolution Confirmatory Orders

Notice of Violation (1 Sample)

The inspectors reviewed the licensee's response to Notice of Violation 05000483/2017007-01, Not Verifying the Operation and Timing of the Engineered Safety Feature Transformer XNB01 Load Tap Changer, and determined that the reason, corrective actions taken and planned to address recurrence, and the date when full compliance was achieved for this violation is adequately addressed and captured on the docket.

INSPECTION RESULTS

Failure to Maintain Emergency Operating Procedures			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000483/2018001-01 Closed	[H.3]—Human Performance, Change Management	71111.11—Licensed Operator Performance
The inspectors identified a Green, non-cited violation of Technical Specification 5.4.1.a, "Procedures," for the licensee's failure to maintain emergency operating procedures for aligning auxiliary feedwater suction sources. Specifically, the licensee added continuous action steps to emergency operating procedures that placed both motor-driven auxiliary feedwater pumps in pull-to-lock and isolated their associated recirculation lines after depleting the two non-safety-related suction sources. These actions cause two of the three safety related auxiliary feedwater pumps to be rendered inoperable prior to aligning the safety related suction source of essential service water which is credited in accident analysis.			

Description:

On March 7, 2018, the inspectors performed an observation of licensed control room operators and reviewed the use of auxiliary feedwater pumps (AFW or AFPs) in Emergency Operating Procedures (EOPs). The AFW system provides a reliable source of water to the steam generators and removes thermal energy from the reactor coolant system through the release of secondary steam to the atmosphere. The AFW pumps are comprised of two motor-driven (MD) pumps and one turbine-driven (TD) pump. Each pump has recirculation lines to provide a constant discharge pathway and prevent pump damage. These AFW pumps can be supplied with the following three suction sources:

(1) Condensate storage tank (CST) - non-safety-related and normally aligned
(2) Hardened CST (HCST) - non-safety-related
(3) Essential service water (ESW) - safety-related

In their review of EOPS, the inspectors noted that the following continuous action step was found in several EOPs and titled "AFW Supply Switchover Criteria:"

If CST to AFP suction header pressure lowers to less than 11.5 PSIG,
THEN PERFORM EOP Addendum 42, HCST Alignment.
If CST to AFP suction header pressure lowers to less than 2.75 PSIG,
THEN PERFORM EOP Addendum 19, Aligning ESW to AFW Suction.

The inspectors reviewed EOP Addendum 42, "HCST Alignment," Revision 1, which states the following and accomplishes it in step 1 of the addendum:

> When the HCST is supplying AFW, ONLY the TDAFW will be used, since it can be aligned to recirc back to the HCST. Therefore, the MDAFPs will be placed in Pull-to-Lock prior to isolating MDAFP recirc lines back to the CST.

The inspectors noted that EOP Addendum 19, "Aligning ESW to AFW Suction," Revision 3, did not restore the isolated and disabled motor-driven AFW pumps. Instead, EOP Addendum 19 refers only to the ESW valve lineup. As written, the discussed EOP addenda would leave the control room staff with only the turbine-driven AFW pump available.

The inspectors then reviewed accident analysis including section 15.2.8, "Feedwater System Pipe Break," of the Final Safety Analysis Report which states:

> For the auxiliary feedwater system, the worst case configuration has been used, i.e., only three intact steam generators receive auxiliary feedwater following the break . . . one motor-driven AFW pump to the intact steam generator…the turbine-driven AFW pump has been assumed to fail . . . the second motor-driven AFW pump is assumed to deliver…equally split to the two remaining intact steam generators . . .

The inspectors noted that the accident analysis of Final Safety Analysis Report chapter 15 does not refer to use of the HCST and does not refer to operator action to manually un-isolate motor-driven AFW pumps to reach and maintain safe shutdown.

The inspectors reviewed the extent of condition for the "AFW Supply Switchover Criteria" continuous action steps and found it in the following EOPs:

(1) E-0, "Reactor Trip or Safety Injection," Revision 19
(2) E-1, "Loss of Reactor or Secondary Coolant," Revision 19
(3) E-3, " Steam Generator Tube Rupture," Revision 22
(4) ES-0.1, "Reactor Trip Response," Revision 18
(5) FR-H.1, "Response To Loss of Secondary Heat Sink," Revision 18

The inspectors noted the "HCST Alignment" addendum was created in February 2016 and modified in October 2016 to the current Revision 1. The procedure review process noted the non-safety HCST "is a useful water source prior to using the ESW . . . the HCST is maintained at a higher cleanliness." Further, the procedure review noted the HCST:

> does not have a recirculation line from the Motor Drive Aux Feed pumps to the HCST . . . EOP Add 42 allows for the alignment of the recirc valves and stops the Motor Drive Aux Feedwater Pumps to prevent possible damage from overheating. Since this overall modification has been evaluated previously, this procedure change does not require further 50.59 review.

The inspectors concluded the licensee failed to maintain EOPs for aligning auxiliary feedwater suction sources. Specifically, the EOPs placed both motor-driven auxiliary feedwater pumps in pull-to-lock and isolated their associated recirculation lines prior to aligning the safety-related suction source of essential service water. This configuration and operator

actions are not supported by the accident analysis in the Final Safety Analysis Report. Further, the licensee did not provide an adequate procedure for restoring the motor-driven AFW pumps from this configuration. Since the continuous action steps are pervasive across EOPs, it is plausible that an operating crew would enact the AFW supply switchover actions prior to fully diagnosing the accident and contrary to the goal of the EOP they were utilizing.

Corrective Actions: The licensee issued a night order clarifying the requirements for auxiliary feedwater in the EOPs and revised EOP Addendum 42, "HCST Alignment."

Corrective Action Reference: Condition Reports 201801260 and 201801570.

Performance Assessment:

Performance Deficiency: The failure to maintain Emergency Operating Procedures for aligning auxiliary feedwater suction sources was a performance deficiency.

Screening: This performance deficiency was more than minor, and therefore a finding, because it adversely affected the procedure quality attribute of the Mitigating Systems Cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee added continuous action steps to EOPs that placed both motor-driven auxiliary feedwater pumps in pull-to-lock and isolated their associated recirculation lines after depleting the two non-safety-related suction sources. These actions cause two of the three safety related auxiliary feedwater pumps to be rendered inoperable prior to aligning the safety related suction source of essential service water which is credited in accident analysis.

Significance: Using Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012, the inspectors determined that the finding was of very low safety significance (Green) because (1) the finding was not a deficiency affecting the design or qualification of a mitigating system; (2) the finding did not represent a loss of system and/or function; (3) the finding did not represent an actual loss of function of a single train for greater than its technical specification allowed outage time; and (4) the finding does not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours.

Cross-Cutting Aspect: The finding had a cross-cutting aspect in the area of human performance associated with change management because the licensee failed to use a systematic process for evaluating and implementing change so that nuclear safety remains the overriding priority. Specifically, the licensee prioritized the motor-driven AFW pumps' health due to a lack of recirculation ability over the accident analysis by not adequately screening the procedure changes into 50.59 review in 2016.

Enforcement:

Violation: Technical Specification 5.4.1.a requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2. Section 6 of Appendix A to Regulatory Guide 1.33, Revision 2, requires procedures for combating emergencies and other significant events. The licensee established EOP Addendum 42, "HCST Alignment," Revision 1, in part, to meet the regulatory requirement. Step 1 of EOP Addendum 42 placed both motor-driven auxiliary feedwater pumps in pull-to-lock and isolated their associated recirculation lines.

Contrary to the above, prior to March 7, 2018, the licensee failed to maintain procedures for combating emergencies and other significant events. Specifically, the licensee failed to maintain EOPs for aligning auxiliary feedwater suction sources. The licensee added continuous action steps to EOPs that placed both motor-driven auxiliary feedwater pumps in pull-to-lock and isolated their associated recirculation lines after depleting the two non-safety-related suction sources. These actions cause two of the three safety related auxiliary feedwater pumps to be rendered inoperable prior to aligning the safety related suction source of essential service water which is credited in accident analysis.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy.

Unresolved Item (Closed)	Possible Incorrect Screening of the Spent Fuel Pool Decay Heat Removal Key Safety Function URI 05000483/2016001-01	71111.05AQ—Quarterly Inspection

Description: In Unresolved Item 05000483/2016001-01, the inspectors documented an issue of concern with the licensee's National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generating Plants," non-power operations assessment. Specifically, the inspectors developed an issue of concern because the licensee screened the potential loss of spent fuel pool cooling from further consideration for any fire event during non-power operations based on adequate procedural guidance and time when the procedures would not maintain the fuel in a safe and stable condition.

To address this unresolved item, the inspectors requested that the Office of Nuclear Reactor Regulation (NRR) work with the Nuclear Energy Institute NFPA 805 Task Force in accordance with the NFPA 805 Frequently Asked Questions (FAQ) Program to review and update the guidance in FAQ 07-0040, "Non-Power Operations Clarifications," Revision 4. The inspectors documented this request in a memo, dated March 31, 2016 (ML16091A152). The updated guidance was issued in FAQ 07-0040, Revision 5 on May 20, 2016 (ML17331B109). This revision was accepted by NRR staff in a memo, dated November 28, 2017 (ML17331B108).

The revised guidance provided clarification for the treatment of spent fuel pool cooling during non-power operations. The revised guidance stated that, "Spent fuel pool configurations are not considered to be risk-significant and are not treated as a higher risk evolution." In the approval memo, the NRR staff agreed with the revised guidance, stating, "The NRC staff agrees that the loss of spent fuel pool cooling does not need to be considered a higher risk evolution."

The licensee documented the non-power operations assessment in Calculation KC-26, Appendix 1, "NFPA 805 Non-power Operations Assessment," Revision 3. The licensee performed this assessment based, in part, on guidance in FAQ 07-0040, Revision 4.

During the current inspection, the inspectors reviewed the licensee's non-power operations assessment and the revised guidance in FAQ 07-0040, Revision 5. In accordance with the revised guidance, the licensee did not need to perform additional analyses (Steps F.2 and F.3. of FAQ 07-0040) associated with spent fuel pool cooling because the staff agreed that the normal fire protection program defense-in-depth actions provide reasonable assurance that the spent fuel pool remains less than boiling. Based on the licensee's non-power operations assessment and the revised guidance, the inspectors determined that no performance deficiency existed.

Corrective Action Reference: Condition Report 201600726

Observation	92702—Followup on Traditional Enforcement Actions Including Violations, Deviations, Confirmatory Action Letters, Confirmatory Orders, and Alternative Dispute Resolution Confirmatory Orders

Discussion: The inspection team determined that the licensee had not: 1) adequately performed a timing test of the transformer XNB01 load tap changer to ensure proper operation; and 2) periodically performed a timing test of the transformer XNB01 load tap changer to ensure proper operation to maintain the operability of the offsite power sources. Since the issuance of the violation in 2014, the licensee had opportunities to perform a timing test of transformer XNB01 load tap changer (refueling outages in fall 2014 and spring 2016).

Corrective Steps Taken and Results Achieved: The timing test of the XNBO1 load tap changer was successfully tested on October 20, 2017. Timing testing of the XNBO1 and XNB02 load tap changers will continue to be performed on a routine basis, going forward. Also, Callaway work management procedure will be revised to establish schedule dates for jobs associated with addressing NRC violations. Rescheduling jobs beyond the scheduled date would require justification as well as approval by management. The licensee will review any NRC violations received since October 2015 for jobs that are credited for restoring compliance. The basis for selecting October 2015 was that it coincided with the last time a comprehensive pre-Problem Identification and Resolution inspection self-assessment was performed. In that assessment, the timeliness of corrective actions for NRC violations prior to October 2015 was evaluated. Lessons learned in connection with this Notice of Violation will be communicated by station leadership. This will include expectations on identifying and adhering to the scheduled date for jobs addressing violations, as mentioned above. Both actions were complete by February 28, 2018.

The inspectors reviewed the licensee's response to the Notice of Violation along with corrective action documents. All findings were documented in NRC Inspection Report 05000483/2017007, ADAMS accession number ML17283A392. Notice of Violation 0500483/2017007-01 is closed.

MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

On April 4, 2018, the inspectors presented the integrated quarterly resident inspection results to Mr. Tim Herrmann, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure 71111.01: Adverse Weather Protection

Procedures

Number	Title	Revision
OTN-QJ-00003	Plant Freeze Protection Heat Tracing Procedure	3
OTO-ZZ-00012	Severe Weather	39

Condition Reports

201800054 201800255

Inspection Procedure 71111.04: Equipment Alignment

Procedures

Number	Title	Revision
OTN-NK-00001	Class 1E 125 VDC Electrical System	15
OTN-NN-00001	120 V Vital AC Instrument Power – Class 1E (Channel 1)	21
OTN-EG-00001	Component Cooling Water System	61

Calculations

Number	Title	Revision
E-H-18	System NN Relay Settings – Calculate Settings for NN Protective Relays	1
GK-11	Electrical Heat Loads in the Control Building During Normal and ESFAS Conditions	4
GL-10 Add 2	Evaluate Tube Plugging Limits for SGL 15 A/B	1
EG-54	Allowable Gas Void Volume for each Train of the Component Cooling Water Suction Piping	
M-EG-20	Max CCW Temperature Post LOCA	

Miscellaneous

Number	Title	Revision
10466-M-612	Design Specification for Room Coolers	8
M-618.2	Spec for Q-Listed HVAC Ductwork (Installation)	12
RFR 180048	Evaluate Non-Safety Accessories in Safety HVAC Systems	

Miscellaneous

Number	Title	Revision
M-22EG01	Piping and Instrumentation Diagram Component Cooling Water System	11
ULDBD-EG-01	Component Cooling Water System	1
M-082-00039	Instruction Manual for Component Cooling Water Pumps	24

Condition Reports

201707171	201706754	201800235	201800933	201801160
201800157	201800176	201303691		

Inspection Procedure 71111.05: Fire Protection

Procedures

Number	Title	Revision
	Fire Preplan Manual	38
FPP-ZZ-00000	Guidelines for Writing Prefire Strategy Procedures and Preplans	8
APA-ZZ-00700	Fire Protection Program	24

Condition Reports

201706984	201801219	201801220	200910299	200505787
200809214	201604688			

Inspection Procedure 71111.06: Flood Protection Measures

Procedures

Number	Title	Revision
	Fire Preplan Manual	38
OTO-ZZ-00005	Flooding	2

Calculations

Number	Title	Revision
AMN-010-CALC-002	Flood Levels in Control Building Rooms Due to Pipe Break or Crack	

Condition Reports

201609311 201800649

Inspection Procedure 71111.07A: Heat Exchanger Performance

Procedures

Number	Title	Revision
HX-1.PMB	Heat Exchangers	42
APA-ZZ-00801	Foreign Material Exclusion	45
EDP-ZZ-01112	Heat Exchanger Predicative Performance Manual	22

Calculations

Number	Title	Revision
KJ-20	Evaluate Tube Plugging Limits for EKJ03A/B, EKJ04A/B, and EKJ06A/B	
M-1196-00002	Jacket Water Cooler Performance Evaluation	

Jobs

13511907 09512424

Condition Reports

201500625 201600703 201800394 201801456 200803533

200909091 200204569

Inspection Procedure 71111.11: Licensed Operator Requalification Program and Licensed Operator Performance

Procedures

Number	Title	Revision
AL-30	Auxiliary Feedwater System Performance During a Loss of Normal Feedwater Flow and Non-Emergency A/C Power	6
E-0	Reactor Trip or Safety Injection	19
ISF-AL-00P37	CST to AFP Suction Header Pressure Channel Operational Test	16
ISL-BB-0F434	RCS Flow Channel Cal Loop 3 Protection 1	29
OSP-AL-00003	Auxiliary Feedwater LSP CST to ESW Valve Operability	17

Procedures

Number	Title	Revision
T61.0810 8	Licensed Operator Continuing Training – Simulator Training Scenario Guide	January 23, 2018

Condition Reports

201707139	201102329	201801260

Inspection Procedure 71111.12: Maintenance Effectiveness

Procedures

Number	Title	Revision
APA-ZZ-00395	Significant Operator Response Timing	27
EDP-ZZ-01128	Maintenance Rule Program	25
EDP-ZZ-01128, Appendix 1	SSCs in the Scope of the Maintenance Rule at Callaway	11
EDP-ZZ-01128, Appendix 2	Summary of SSC Performance Criteria	32
EDP-ZZ-01128, Appendix 3	Maintenance Rule Shutdown Performance Criteria	3
EDP-ZZ-01128, Appendix 4	Maintenance Rule System Functions	18
OSP-SA-2413A	Train A Diesel Generator and Sequencer Testing	26

Miscellaneous

Number	Title	Revision
E-051C-00010	Qualification Report for Class 1E 125 VDC Electronically Controlled Manual Switches	
E-1061	Specification for Class 1E AC Vital Bus Inverters and Swing Inverters	
MP-130020	Modification to Install Class 1E Swing Inverters	7

Condition Reports

200805033	201303158	201307777	20143898	201407350
201505907	201602855	201603286	201603312	201604824
201605545	201607358	201702520	201705797	201706481
201800216				

Miscellaneous

Number	Title	Revision/ Date
LER 2014-003-00	Inverter NN11 Inadvertently Transferred to Its Alternate Source	August 7, 2014
LER 2014-003-02	Inverter NN11 Inadvertently Transferred to Its Alternate Source	August 6, 2015
ODMI 15-0006	Thermography Indicated Elevated Temperatures on Disconnect NN0311	2

Inspection Procedure 71111.13: Maintenance Risk Assessments and Emergent Work Control

Procedures

Number	Title	Revision
APA-ZZ-00750	Hazard Barrier Program	40
ODP-ZZ-00002, Appendix 2	Risk Management Actions For Planned Risk Significant Activities	13
EDP-ZZ-01129	Callaway Energy Center Risk Assessment	47
APA-ZZ-00322	Integrated Work Management Process Description	20
APA-ZZ-00322, Appendix F	Online Work Integrated Risk Management	16
APA-ZZ-00315	Configuration Risk Management Program	14
ODP-ZZ-00002, Appendix 1	Protected Equipment Program	27
OTN-BG-00001	Chemical and Volume Control System	56
MPE-ZZ-QY054	Inspection and Test of Protective Lockout Relays, General Electric Type HEA	5
OTN-MD-00001	Switchyard Breakers and Disconnects	28
MTM-AL-QP002	Turbine Driven Auxiliary Feedwater Pump	13

Jobs

16513469	16508486	18000148	16508306	14504707
16514154	15503300	17500047		

Condition Reports

201800516	201106906	200604069	201605319	201705780

201505319	201800176	201800157	200000661

Inspection Procedure 71111.15: Operability Determinations and Functionality Assessments

Procedures

Number	Title	Revision
APA-ZZ-00391	Beyond Design Basis Program	4
APA-ZZ-00391, Appendix 2	Sequence of Events Timeline	
OSP-KC-00015	Fire Door Inspections	18
APA-ZZ-00750	Hazard Barrier Program	40
OTG-ZZ-00006	Plant Cooldown Hot Standby to Cold Shutdown	78
OSP-GT-00003	Containment Closure	21
OSP-GP-00001	Containment Isolation Verification	23

Miscellaneous

Number	Title	Revision
M-22FC02	Auxiliary Feedwater Pump Turbine P&ID	24
M-FC-03	Auxiliary Feedwater Pump Turbine Room Analysis	1
M-YY-49, Addendum 4	Additional HELB Scenarios	1
A-2302	Auxiliary & Reactor Building Elevation 2000 Floor Plan	15
	Westinghouse Clarification on the Basis for the Boil Off Time of the Callaway Energy Center Spent Fuel Pool	1
ULNRC-06421	Licensee Event Report 2018-001-00 Violation of Technical Specification 3.6.3 Containment Isolation Manual Valve Found in Open Position	
M-22KA02	Compressed Air System P&ID	27

Jobs

18000323	13511394	09501018	18000249	18000735

Condition Reports

201800066	201800235	201800194

Inspection Procedure 71111.18: Plant Modifications

Miscellaneous

Number	Title	Revision
MP 12-0020	Field Change Notice	4
	Seismic II/I Hazard Analysis Review for MP 12-0020	
	STARS ENG-5001-8.3, Section 13 FP Review	

Inspection Procedure 71111.19: Post Maintenance Testing

Procedures

Number	Title	Revision
MTM-AL-QP002	Turbine Driven Auxiliary Feedwater Pump	13
MPE-NK-QB004	NK Class 1E Battery Charger Inspection	10
OSP-GK-0002B	Train B Control Room Ventilation and Pressure Test	18
OSP-NE-0001A	Standby Diesel Generator A Periodic Tests	64
OSP-NE-00003	Technical Specification Actions – A/C Sources	31
OTN-EF-00001	Essential Service Water System	75

Miscellaneous

Number	Title	Revision
M-22FC02	Auxiliary Feedwater Pump Turbine P&ID	24
MP 15-0020	Install Fuses in 250Vdc Control Circuits	4
E-23NK11	125 Volt DC Class 1E Power System Schematic Diagram	3

Jobs

17004200	16002592	15505343	16509603	18000735
14000994	18000457	17503253	13511907	17004111
16511918				

Condition Reports

201706923	201800442	201704649	201704899	201800145
201700177	201800206	201705121	201604537	201110062
201800926	201820013	201800874	200801131	201703920
200811040				

Inspection Procedure 71111.22: Surveillance Testing

Procedures

Number	Title	Revision
OSP-BG-P005A	Centrifugal Charging Pump A Inservice Test	49
APA-ZZ-00340	Surveillance Program Administration	44
OSP-BG-00001	Boron Injection Flow Paths Modes 1, 2 and 3	24
ODP-ZZ-00036	Technical Specification Application for Containment Isolation Valves	7
EDP-ZZ-01128	Summary of SSC Performance Criteria	32
APA-ZZ-00549, Appendix B	Guidelines used to determine functional importance for a component	13

Miscellaneous

Number	Title	Revision/ Date
M-721-00093	Instruction Manual for Centrifugal Charging/Safety-Injection Pumps Operation and Maintenance	33
M-22BG01	Chemical and Volume Control System P&ID	33
MP 12-0020	Field Change Notice	4
Night Order	Condition Report 201706233/Condition Report 201706926, KCV0478 may stick open during flow through penetrations P067	January 31, 2018
ULDBD-BB-001	Reactor Coolant System	2

Jobs

17514632	05504483	17004820

Condition Reports

201800330	201800423	200702585	200901841	200306153
200502806	201706233	201706926	201800323	

Inspection Procedure 71114.06: Drill Evaluation

Procedures

Number	Title	Revision
APA-ZZ-00925	Training and Qualification of Plant Personnel	39

Procedures

Number	Title	Revision
EIP-ZZ-A0066	Radiological Emergency Response Plan Training	24
EIP-ZZ-A0001	Emergency Response Organization	19

Condition Reports

201801245	201801251	201801252	2000800921	201008419
200808431				

Inspection Procedure 71151: Performance Indicator Verification

Procedures

Number	Title	Revision
CSP-ZZ-02550	Pressurized Reactor Coolant Sample	30
CSP-ZZ-07600	RCS Activity Determinations	41

Miscellaneous

Number	Title	Revision Date
	MSPI Derivation Reports (Cooling Water Systems)	Various
	Control Room Log	Various
	NRC Performance Indicator Transmittal Report, First Quarter 2015, Mitigating Systems Cornerstone	April 11, 2018
	NRC Performance Indicator Transmittal Report, Second Quarter 2015, Mitigating Systems Cornerstone	July 18, 2018
	NRC Performance Indicator Transmittal Report, Third Quarter 2015, Mitigating Systems Cornerstone	October 25, 2018
	NRC Performance Indicator Transmittal Report, Fourth Quarter 2015, Mitigating Systems Cornerstone	January 16, 2018

Condition Reports

201101025 201004284

Inspection Procedure 71152: Problem Identification and Resolution

Procedures

Number	Title	Revision
APA-ZZ-00500	Corrective Action Program	68
ESP-EF-0001A	Ultimate Heat Sink Train A Cooling Tower Fill Inspection	3

Miscellaneous

Number	Title	Revision
EM-04	Safety Injection System (Cold Leg Recirculation Phase) Fault Tree Model	1
BG-32	High Pressure Coolant Injection System (Cold Leg Recirculation Phase) Fault Tree Model	0
BN-28	RWST Drain Down Time and Volume Loss During SBLOCA	0
M-015-U012-08	Specification for Ultimate Heat Sink Cooling Tower	1

Condition Reports

201706900	201707137	201704706	201010236

Inspection Procedure 71153: Follow-up of Events and Notices of Enforcement Discretion

Drawings

Number	Title	Revision
E-21NK02(Q)	Class IE 125V dc System Meter and Relay Diagram	11
J-200-00075	Main Control Board RL025 and RL026 Wiring Diagram	15
E-21NK01(Q)	Class IE 125V dc System Meter and Relay Diagram	11
E-051-00079	Battery Chargers Wiring Diagram	9
E-23NK11(Q)	125 Volt dc Class IE Power System Schematic	3
E-23CD02	Schematic Diagram Emergency Seal Oil Pump	3
E-23FC02	Schematic Diagram Feed Pump Turbine Emergency Bearing Oil Pumps	5
E-21NK02(Q)	Class IE 125V dc System Meter and Relay Diagram	17
E-23CB03	Schematic Diagram Emergency Bearing Oil Pump	8
M-840-00014	Hydrogen and Water Cooling Wiring Diagram	10
M-840-00023	Schematic Diagram (Hydrology and Stator Cooling)	10
E-21NK01(Q)	Class IE 125V dc System Meter and Relay Diagram	11

Drawings

Number	Title	Revision
E-21NK01(Q)	Class IE 125V dc System Meter and Relay Diagram	17
M-830-00015	Emergency Bearing Oil Pump IC-4061-T1 dc Magnetic Starter	14
M-012-00079	Wiring Diagram (Emergency Oil Pump Starter Circuit)	7
E-051-00058	3Φ SCR Controlled Battery Charger Schematic	12
M-835-00014	D.C. Magnetic Starter 72-13 (CD01) (Counter – Electromotive Force) Emergency Seal Oil Pump Motor	5
J-200-00081	Main Control Board RL025 and RL026 Wiring Diagram	26

Miscellaneous

Number	Title	Revision/ Date
FR-087114	Bimetallic Thermal Overload Relays	December 13, 2017
Calculation KC-26	Nuclear Safety Capability Assessment Calculations: KC-26	1
MP 15-0020	Install Fuses in 250 Vdc Control Circuits To Address NFPA805 Concerns	

Condition Reports

201706133	201706233	201706924	201706926	201801657

Initial Request for Information
Quarterly Baseline Inspection
Callaway Plant

Inspection Report: 05000483/2018001

Inspection Dates: January 1 – March 31, 2018

Inspection Procedure: IP 71111 series, IP 71152

Lead Inspector: Dan Bradley, Senior Resident Inspector

Information Requested For 1st Quarter 2018

The following information should be sent to the resident office in hard copy or electronic format (Certrec IMS preferred) to the attention of Dan Bradley by January 15, 2018. These items shall be available and ready for review on the day indicated in this request. Please provide requested documentation electronically in "pdf" files, Excel, or other searchable formats, if possible. The information should contain descriptive names and be indexed and hyperlinked to facilitate ease of use. If requested documents are large and/or only hard copy formats are available, please inform the inspector and provide subject documentation.

Please provide the following information for the **125 VDC (NK) and Instrument AC Power (NN) systems**:

1. A list of all calculations and drawings associated with the selected systems.

2. A list of condition reports associated with the selected systems for the last 3 years.

3. A list of work orders associated with the selected systems for the last 3 years, including all open work orders.

4. An Excel spreadsheet list of equipment basic events (with definitions), including importance measures sorted by risk achievement worth and Fussell-Vesely from your internal events probabilistic risk assessment. Include basic events with a risk achievement value of 1.3 or greater.

5. A list of any pre-existing evaluations or calculations with low design margins for the selected systems.

6. A list of maintenance rule components and functions; based on engineering or expert panel judgment, for the selected systems.

7. A list of maintenance rule functional failure evaluations for the last 3 years for the selected systems.

8. A list of operating experience evaluations for the last 3 years for the selected systems.

9. A list of all procedures and calculations that involve time-critical operator actions.

10. A list of permanent and temporary modifications performed in the past 3 years for the selected systems. Include a list of any documents associated with modifications such as: calculations, specifications, vendor manuals, Final Safety Analysis Report, Technical Specifications and Bases updates, updated procedures, and maintenance and surveillance activities and procedures.

11. A list of the design calculations that provide the design margin information for the selected systems.

12. A list of root cause evaluations associated with component failures or design issues initiated/completed in the last 3 years for the selected systems.

13. A list of any common-cause failures of components in the last 3 years for the selected systems.

14. An electronic copy of the design bases documents for the selected systems.

15. An electronic copy of the system health notebooks for the selected systems.

Inspector Contact Information:

Dan Bradley
Senior Resident Inspector
573-676-3181
Dan.Bradley@nrc.gov

Mailing Address:
U.S. NRC Resident Inspector Office
8201 NRC Road
Steedman, MO 65077

CALLAWAY PLANT - NRC INTEGRATED INSPECTION REPORT 05000483/2018001
DATED MAY 3, 2018

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ROP Reports

ADAMS ACCESSION NUMBER: ML18123A395

■ SUNSI Review: By: NHT/rdr | ADAMS: ■ Yes ☐ No | ☐ Non-Publicly Available ■ Publicly Available | ■ Non-Sensitive ☐ Sensitive | Keyword: NRC-002

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